Preview - Information

Thank you for your interest in this Mega Bundle. This product contains multiple Workbooks and Google Lesson Slides. Within this preview, you will see:

- ✓ A selection of Ready-To-Use Google Lesson Slides for each unit.
- ✓ A selection of worksheets included in each workbook.

When you make a purchase, you will receive a folder that contains each of the .pdf workbook files and links to where you can make copies of the Google Lessons units to your Google Drive.

Thank you for shopping with us. Please let us know if you have any questions at:

rob@supersimplesheets.com

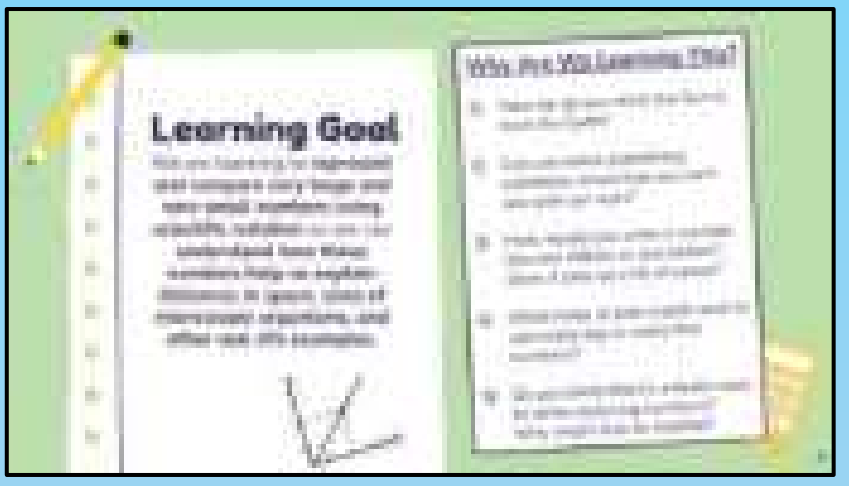
Google Slides Lessons Preview

Ontario Math Number Unit – Grade 8

3-Part Lesson Format

Part 1 – Minds On!

- Learning Goals
- Discussion Questions
- Why Math Is Important
- And More!

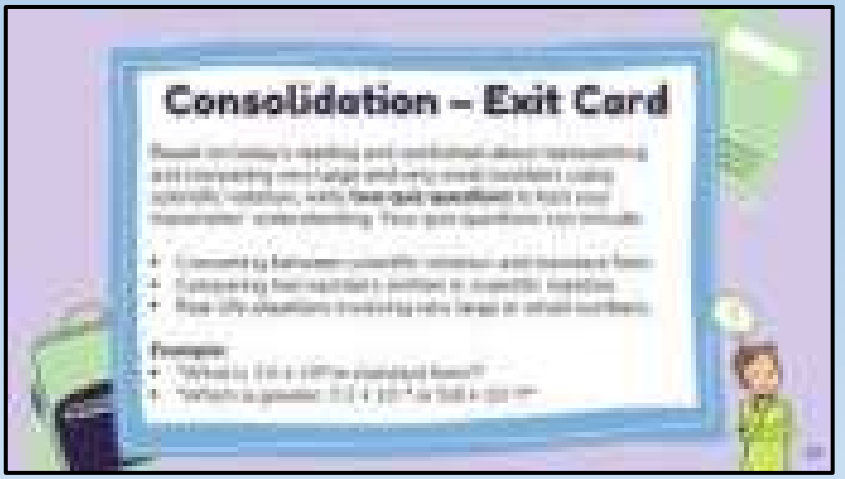


Part 2 – Action!

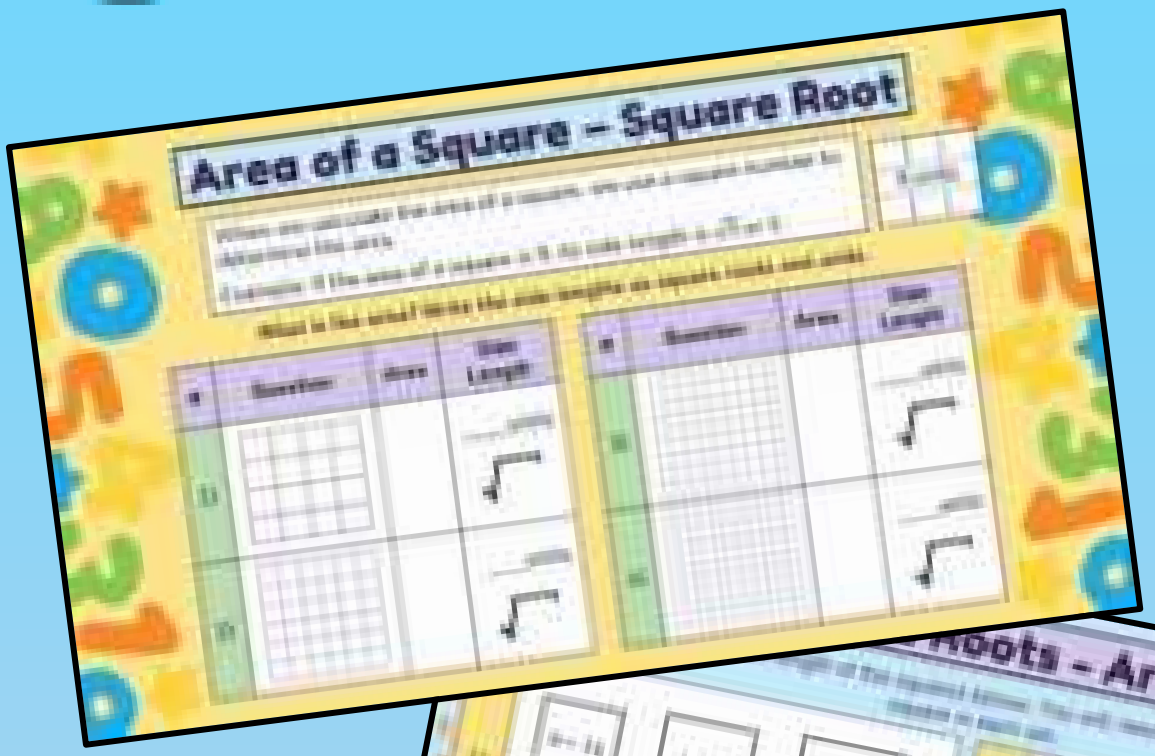
- Questions
- Matching
- Drag and Drop
- Videos
- And More!

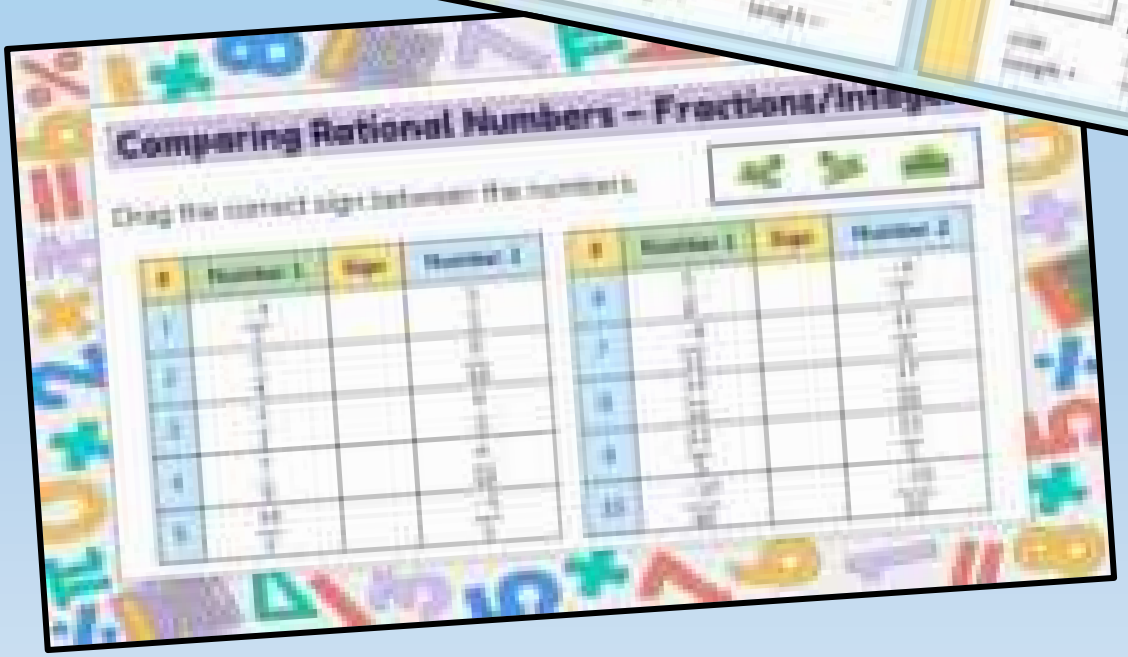
Part 3 – Consolidation!

- Exit Cards
- Word Problems
- Quizzes
- Student Created Quizzes

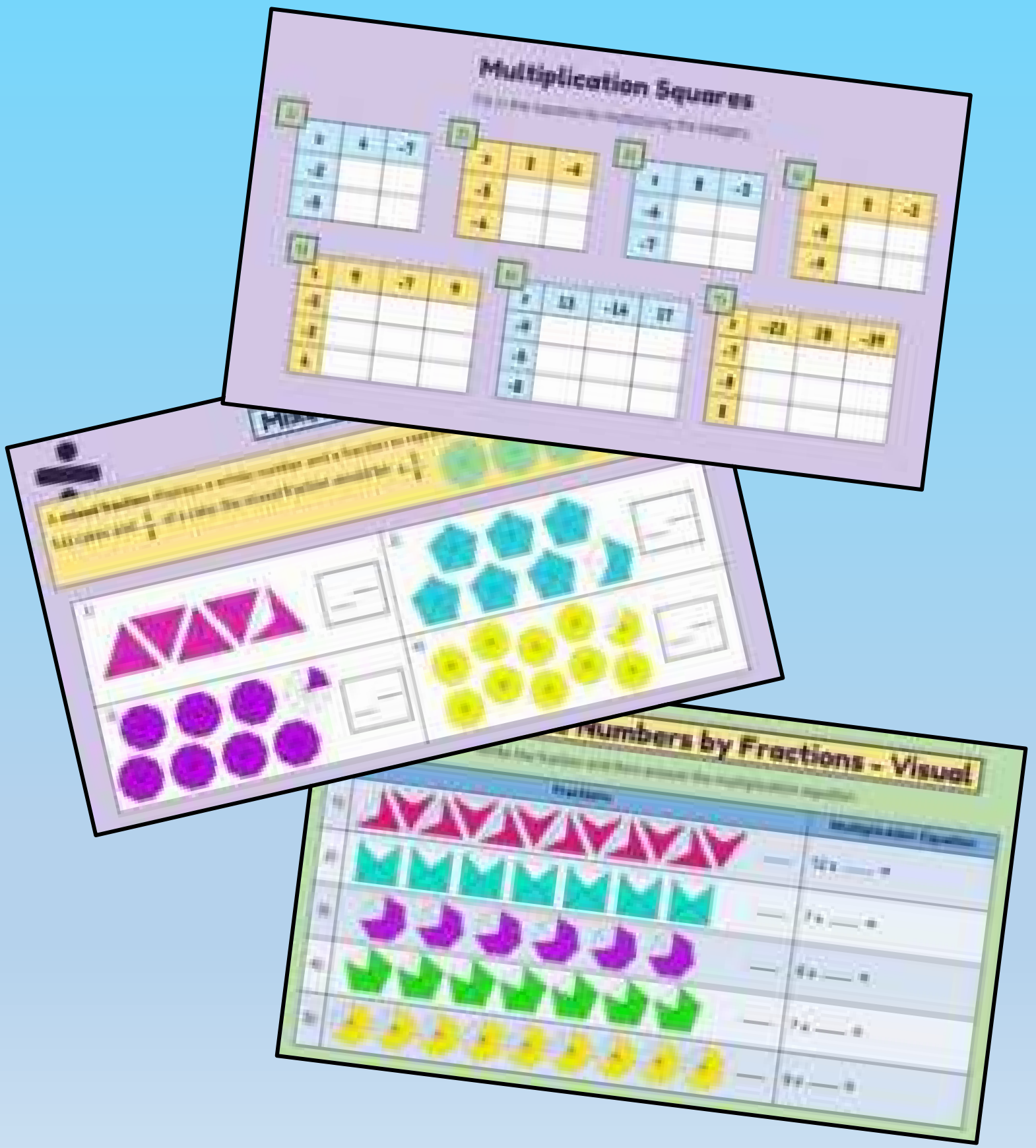


Ontario Math Number Unit – Grade 8





Ontario Math Number Unit – Grade 8



Workbook Preview

Name: _____ 4

Place Value - Trillions

Part 1 Circle the digit for each place value written

	Number	Digit
1)	185 845 698	Ten-millions place
2)	8 854 856 158	One-billions place
3)	57 685 120 085	Ten-thousands place
4)	875 105 984 852	Hundred-millions place
5)	3 857 582 204 785	Ten-billions place
6)	84 965 874 036 448	One-trillions place

Part 2 What place value is underlined?

	Number	Place Value
1)	856 848 416 519 641	
2)	489 465 131 898 474	
3)	871 485 217 481 819	
4)	757 787 465 131 183	
5)	945 846 513 518 234	

Part 3 Trillions are massive numbers! Write examples of when we might use trillions

1)	
2)	

Name: _____ 7

Scientific Notation - Powers of 10

Powers of 10 are used to make it easier to write larger numbers. Using powers of 10 allows us to write less zeros than we normally would. **$563000 = 5.63 \times 10^5$**

For example:
5,000 = 5 x 1,000 or using powers of 10, you can say 5,000 = 5 x 10^3

The 3 is called an exponent. The exponent shows how many places the decimal has moved.

Part 1 Fill in the value for the exponents below

	Standard Notation	Using the Power of 10
1)	10 000	1 x 10□
2)	100	1 x 10□
3)	1 000 000	1 x 10□
4)	10 000 000	1 x 10□
5)	1 250 000 000	25 x 10□
6)	5 458 000 000	0
7)	7 030 800 000 000	30
8)	30 8900 000 000 000	3.0
9)	527 200 000 000 000	5.272 x
10)	651 454 460 000 000	6.5145446 x 10□

Part 2 Kaylee made mistakes in her homework. Write the correct answer for her

	Standard Notation	Kaylee's Answer	Correct Answer
1)	652 000 000	652 x 10□ 6	
2)	13 300 000 000	133 x 10□ 8	
3)	853 120 000 000	85312 x 10□ 7	

Name: _____ 11

Comparing Numbers - Scientific Notation

Part 1 Which number is larger? Use < > or = to compare the numbers

1)	3×10^{6}	☐	4×10^{6}	6)	5×10^{-4}	☐	6×10^{-5}
2)	2	☐	6×10^{7}	7)	1.8×10^{-3}	☐	4.21×10^{-4}
3)	$1.[illegible] \times 10^{8}$	☐	$7.[illegible] \times 10^{9}$	8)	8×10^{-5}	☐	7.5×10^{-5}
4)	3.6×10^{5}	☐	$6.[illegible] \times 10^{7}$	[illegible]	2.2×10^{-6}	☐	2.1×10^{-7}
5)	9.14×10^{7}	☐	$9.22 \times 1[illegible]$	[illegible]	[illegible]	☐	3.66×10^{-8}

Part 2 Answer the word problems below

1) The population in China is 1.398×10^{9}. The population of the [illegible] 3.282×10^{7}. Which country has the larger population?

2) The distance from Earth to Mercury is 9.16×10^{7}. The distance from Earth to Venus is 4.14×10^{7}. Which planet is further from Earth?

3) The approximate wavelength of red light is 7×10^{-7} metres. The approximate wavelength of violet light is 4×10^{-7}. Which wavelength is longer?

Name: ____________________ 13 Curriculum Connection

Place Value - Number Breakdown

Questions | Fill in the blanks below

Number Breakdown

1 050 040 303 010

Tri	Billions	Millions	Thousands	Ones

Fill in the bl... ...ting ...cientific notation below

(___ x 10$^{\square}$) + (___ ... ___ x 10$^{\square}$) + (___ x 10$^{\square}$) + (___ x 10$^{\square}$)

Fill in the pattern below

1 050 040 303 010 , 1 050 040 313 ... , 1 05... , ____________

Fill in the pattern below

1 050 040 303 010 , ____________ , 1 450 040 3... , ...010

Fill in the pattern below

1 050 040 303 010 , 11 050 040 303 010 , ____________ , 31 0...040 303 010

1 050 040 303 010	+100 000	
1 050 040 303 010	+1 001 000	
1 050 040 303 010	+ 100 100 000 000	
1 050 040 303 010	- 1 000 000 000 000	
1 050 040 303 010	- 10 010 000 010	

Name: _____ 16

Place Value Quiz

Part 1 Which place value is the underlined number?

1) 875 315 465 862	2) 764 846 413 211 984	3) 5 651 215 183 165
4) 794 835 123 188 893	5) 32 161 984 634 516	6) 2 487 256 881 254

Part 2 Fi[illegible] below – how many are in the number?

	Number	Billions	Millions	Thousands	Ones
1)	92 504 812 156				
2)	258 184 586 021 648				
3)	807 515 033 665 485				

Part 3 Write the scientific notation of the [illegible] below

	Standard Notation	Scientific
1)	100 000	
2)	1 200 000	
3)	345 300 000	
4)	875 300 000 000	
5)	0.5480000	
6)	0.05700000	
7)	0.0068700000	

Name: _____ 20 Curriculum Connection: M1.9

Perfect Squares - Exponents

When we multiply a number by itself, we can use an exponent. An **exponent** refers to the number of times a number is multiplied by itself. When we represent a perfect square, we can use an exponent to the power of 2, meaning the number multiplied by itself. A power of 1 is the number itself.

Example – 16 is a perfect square (4 x 4) or 4^2

Part 1 Solve by determining the perfect square

	Question	Perfect Square
1)	1^2	
2)	2^2	
3)	3^2	
4)	4^2	
5)	5^2	
6)	6^2	

	Question	Perfect Square
7)	7^2	
8)	8^2	
9)	9^2	
10)	10^2	
11)		
12)		

Part 2 Find out the area of the squares below

When we calculate the area of a square, we are multiplying the length by the width or base times height. Since a square has the same side lengths, the formula is: s^2

	Question	Area
1)	☐ 6cm	
2)	11cm ☐	

	Question	Area
3)	☐ 7mm	
4)	9m ☐	

Name: _____ 23

Comparing Square Roots & Perfect Squares

Part 1 Which number is larger? Use < > or = to compare the numbers

1)	3^2	☐	$\sqrt{100}$
2)	[illegible]	☐	6
3)	[illegible]	☐	5^2
4)	2^2	☐	[illegible]
5)	$\sqrt{36}$	☐	[illegible]

6)	$\sqrt{121}$	☐	11^2
7)	$\sqrt{25}$	☐	-6
8)	50	☐	7^2
9)	4^2	☐	$\sqrt{144}$
10)	[illegible]	☐	$\sqrt{4}$

Part 2 Order from least to great[illegible]

1) $\sqrt{4}$, 4, $\sqrt{16}$, -16, $\sqrt{9}$, $\sqrt{81}$	3) $\sqrt{144}$, [illegible]
2) $\sqrt{64}$, $\sqrt{36}$, -3, 9, $\sqrt{121}$	4) $\sqrt{4}$, 16, $\sqrt{64}$, 9, $\sqrt{}$

Part 3 Challenge: find the square root for each number

1) $\sqrt{289}$	
2) $\sqrt{225}$	
3) $\sqrt{169}$	
4) $\sqrt{361}$	

5) $\sqrt{400}$	
6) $\sqrt{324}$	
7) $\sqrt{256}$	
8) $\sqrt{625}$	

Name: _____ 24

Perfect Squares - Word Problems

Word Problems | Answer the word problems below

1) Which whole numbers between 100 and 150 are perfect squares?

2) Which whole numbers between 150 and 200 are perfect squares?

3) I am a square number. The sum of my digits is 7. What square numbers might I be?

4) What three square numbers have a sum that is 9?

5) Archer is planning to make a square garden this summer. He wants it to have an area less than 50m².

a) What is the largest area the garden could be?

b) What is the side length of the garden?

c) How many metres of fencing will be needed?

d) If one metre of fencing costs Archer $2.50, how much would the entire fence cost him?

Name: _____ 26

Terminating and Repeating decimal

Terminating Decimal	Repeating Decimal
• Decimals that come to an end Example – 2/4 = 0.5	• Decimals that never end Example – 2/3= 0.66666... or $0.\overline{6}$ We can use a line over the repeating number or number pattern to show it repeats forever

Part 1 Is the decimal a repeating or terminating decimal?

1)		6) 0.9	
2) 0.3		7) $0.\overline{72}$	
3) $0.\overline{7}$		8) $0.41\overline{6}$	
4) 0.25		9) 0.15	
5) $0.\overline{6}$		10)	

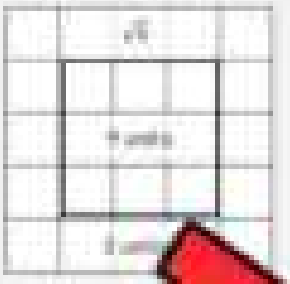
Part 2 Write the decimals below – use [illegible] decimals

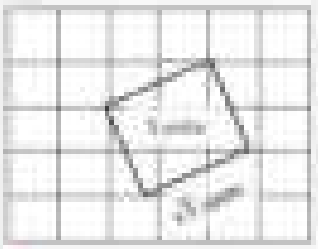
1) $\frac{1}{3}$ = $0.\overline{3}$	2) $\frac{6}{10}$ =	[illegible]
4) $\frac{2}{3}$ =	5) $\frac{8}{11}$ =	6) $\frac{3}{9}$
7) $\frac{1}{4}$ =	8) $\frac{11}{12}$ =	9) $\frac{4}{12}$ =
10) $\frac{3}{5}$ =	11) $\frac{4}{6}$ =	12) $\frac{1}{12}$ =
13) $\frac{5}{9}$ =	14) $\frac{1}{8}$ =	15) $\frac{7}{8}$ =

Name: _____ 27

Estimating Square Roots

Perfect squares can be calculated. Imperfect squares can only be estimated.





An imperfect square and its square root is an irrational number with a decimal number that never ends.

We can estimate a square root by determining the two perfect squares that are closest to it.

Example: $\sqrt{31}$ is between $\sqrt{25}$ and $\sqrt{36}$, which means it is in between 5 and 6. This means that the square of $\sqrt{31}$ is around 5.5. Since 31 is closer to 36 than 25, the answer should be 5.6.

Practice Estimate the square roots of the numbers below by filling in the table.

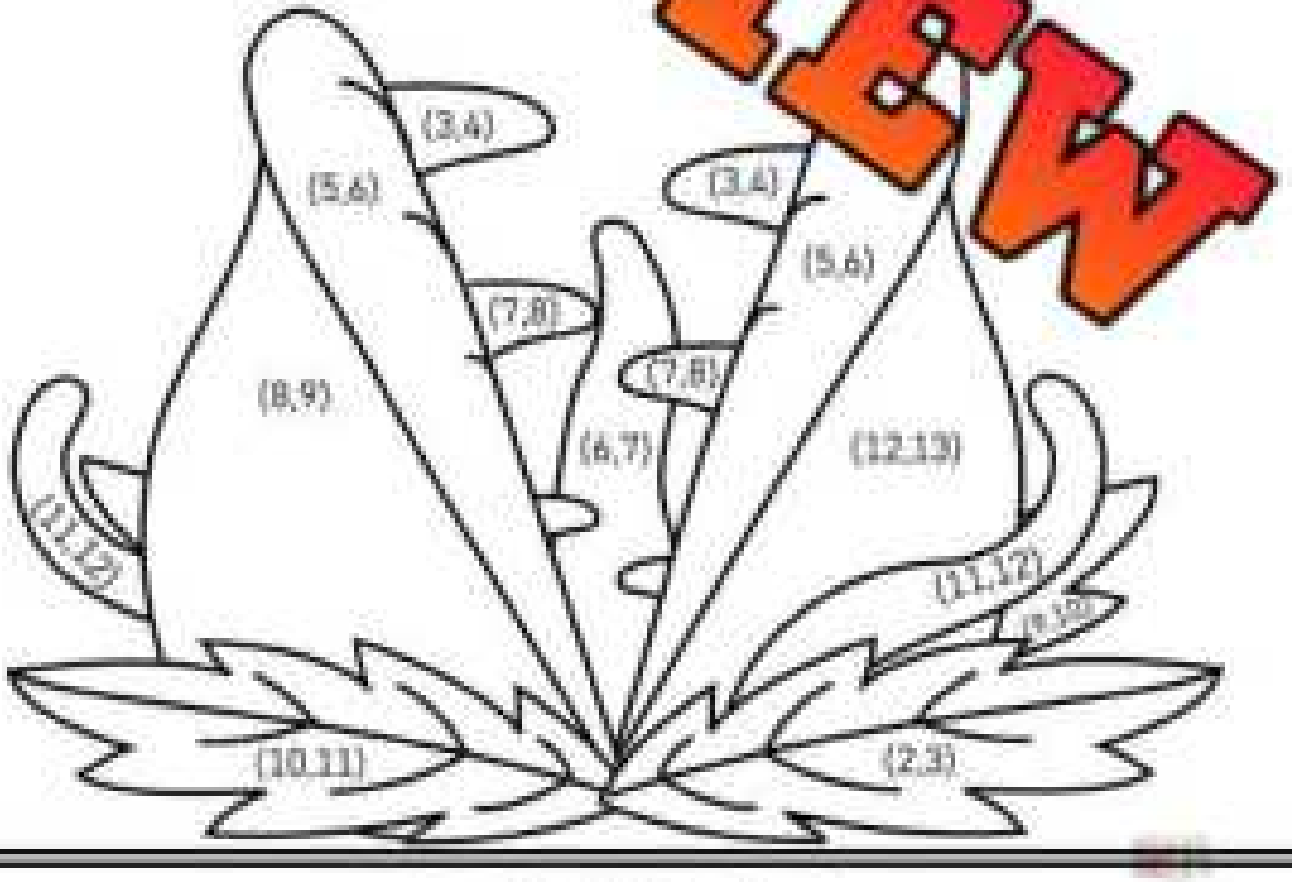
	Non-Perfect Square	Largest Perfect Square	Smallest Perfect Square	Estimate	Calculate round to tenth
1)	$\sqrt{19}$	$\sqrt{16} = 4$	$\sqrt{25} = 5$	4.4	4.4
2)	$\sqrt{42}$				
3)	$\sqrt{68}$				
4)	$\sqrt{91}$				
5)	$\sqrt{29}$				
6)	$\sqrt{13}$				
7)	$\sqrt{55}$				
8)	$\sqrt{73}$				
9)	$\sqrt{6}$				
10)	$\sqrt{130}$				

Name: _____ 28

Estimating Square Roots - Colouring

Practice Find the two square roots between the irrational numbers and colour the picture with the matching colour

	Irrational Number	Square Root 1	Square Root 2	Colour
1)	$\sqrt{32}$	√	√	Light Green
2)	$\sqrt{11}$	√	√	Yellow
3)	$\sqrt{47}$	√	√	Purple
4)	$\sqrt{20}$	√	√	Green
5)	$\sqrt{3}$	√	√	Light Green
6)	$\sqrt{26}$	√	√	Dark Green
7)	$\sqrt{2}$		√	Yellow
8)	$\sqrt{8}$		√	Dark Green
9)	$\sqrt{152}$		√	Green
10)	$\sqrt{89}$			Dark Green



Name: _____ 29

Estimating Square Roots - Riddle

Practice Find the lower and higher perfect squares and write the corresponding letter above the numbers below

	Non-Perfect Square	Lower Perfect Square	Higher Perfect Square
B	$\sqrt{11}$		
Z	$\sqrt{99}$		
S	$\sqrt{55}$		
R	$\sqrt{35}$		
A	$\sqrt{2}$		
A	$\sqrt{6}$		
A	$\sqrt{77}$		
D	$\sqrt{125}$		
E	$\sqrt{18}$		

What's black and white and blue

(64,81)	(81,100)	(4,9)	(121,144)	(36,49)	(16,25)	(9,16)	(49,64)	(1,4)

Name: _____ 33

Comparing Square Roots & Perfect Squares

Part 1 Which number is larger? Use < > or = to compare the numbers

1)	3^2	☐	$\sqrt{110}$	6)	$\sqrt{45}$	☐	7
2)	[illegible]	☐	10	7)	$\sqrt{7}$	☐	3
3)	[illegible]	☐	8	8)	$\sqrt{14}$	☐	3
4)	7	☐	[illegible]	9)	12	☐	$\sqrt{138}$
5)	$\sqrt{29}$	☐	2^2	10) [illegible]		☐	$\sqrt{127}$

Part 2 Order from least to [illegible]

1) $\sqrt{8}$, 2, $\sqrt{10}$, 3, $\sqrt{5}$	3) $\sqrt{82}$, [illegible]
2) $\sqrt{32}$, $\sqrt{41}$, -11, 6, $\sqrt{35}$	4) $\sqrt{140}$, 12, $\sqrt{147}$, 1[illegible]$\sqrt{123}$

Part 3 Circle which numbers are imperfect squares

1)	25, 4, 12, 24, 36, 50, 100, 68, 56, 64, 88, 96, 1, 6, 20
2)	16, 10, 28, 35, 9, 0, 81, 144, 110, 108, 121, 64, 62, 18

Name: _____ 34

Square Roots - Number Line

Part 1 Place each square root on the number line to show its approximate value

1) $\sqrt{38}$	2) $\sqrt{10}$	3) $\sqrt{28}$
4) $\sqrt{42}$	5) $\sqrt{65}$	6) $\sqrt{87}$

7) $\sqrt{62}$		9) $\sqrt{132}$
10) $\sqrt{141}$	11) $\sqrt{}$	$\sqrt{22}$

Part 2 Which value is larger? Use < > or = to compare the values

1)	5	☐	$\sqrt{21}$
2)	3	☐	$\sqrt{14}$
3)	6	☐	$\sqrt{31}$

4)	8.5	☐	$\sqrt{66}$
5)	9.5	☐	$\sqrt{95}$
6)	7.5	☐	$\sqrt{60}$

7)	7.5	☐	$\sqrt{52}$
8)	12.5	☐	$\sqrt{145}$
9)	11.5	☐	$\sqrt{142}$

Name: _____ 38

Comparing Integers

Part 1 Use the <, >, = to compare the integers below

1) 9 ☐ -3 2) -7 ☐ 3 3) -10 ☐ 0

4) -2 ☐ 2 5) 1 ☐ -1 6) -10 ☐ 10

7) -3 ☐ 3 8) -5 ☐ -6 9) 8 ☐ -6

10) -6 ☐ -7 11) -7 ☐ -1 12) -1 ☐ 0

Part 2 Arrange the integers from least to greatest

1) 7, 2, -6, -7, 4	2) 0, -4, 8, 8
3) 0, 3, -4, 5, -6	4) -2, 0, -6, 2, -5
5) 10, -10, -9, 8, -8	6) -8, -7, 7, 0, 8

Name: _____ 39

Curriculum Connection: 8.N.3

Representing Integers as Fractions

Integers are rational numbers that can be represented as fractions. We can represent positive and negative whole numbers as fractions by putting the integer on top of the number 1.

For example: $-5 = \frac{-5}{1}$ and $+9 = \frac{9}{1}$

Part 1 — Fill in the tables below

		Fraction
1)		
2)		
3)		
4)	9	
5)		$\frac{-2}{1}$

	Integer	Fraction
6)	-7	
7)		$\frac{-6}{1}$
8)	5	
9)		$\frac{3}{1}$
10)		

Part 2 — Word problems

1) Sienna pays $60 each month for her phone bill. [illegible] spends a year as an integer and as a fraction.

2) Reagan is filling up her pool with water. Each hour, 100 litres is poured into the pool. Represent how many litres of water poured into the pool after 24 hours as an integer and a fraction.

3) A submarine plunged 64m below sea level. It plunged another 49m before coming back up. Represent how many metres below sea level the submarine was as an integer and a fraction.

Name: _____ 45

Comparing Rational Numbers - Fractions/Integers

Part 1 Use the <, >, = to compare the integers below

1) $\frac{6}{8}$ ☐ $\frac{5}{4}$	5) $\frac{3}{6}$ ☐ $\frac{-5}{10}$	9) $\frac{6}{2}$ ☐ $\frac{9}{4}$
2) $\frac{3}{4}$ ☐ $\frac{-2}{1}$	6) $\frac{9}{1}$ ☐ $\frac{8}{1}$	10) $\frac{2}{10}$ ☐ $\frac{10}{2}$
3) $\frac{5}{5}$ ☐	7) $\frac{-5}{6}$ ☐ $\frac{-5}{4}$	11) $\frac{-6}{1}$ ☐ $\frac{-5}{1}$
4) $\frac{-4}{2}$ ☐	☐ $\frac{4}{4}$	12) $\frac{-15}{3}$ ☐ $\frac{-10}{5}$

Part 2 Arrange the ratio[illegible]s from least to greatest

1) $\frac{6}{2}$, -5, $\frac{-12}{2}$, $\frac{16}{4}$, 2, $\frac{-8}{2}$, -7

2) $\frac{9}{2}$, -4, $\frac{-11}{2}$, $\frac{15}{5}$, 4, $\frac{-5}{1}$, -6

4) $\frac{14}{3}$, 4, $\frac{-15}{4}$, $\frac{20}{4}$, -3, $\frac{-20}{10}$, 8

5) $\frac{11}{3}$, 2, $\frac{18}{2}$, $\frac{-21}{7}$, 8, $\frac{-49}{7}$, -8

Name: _____ 50

Percents Greater Than 100

Percentages are out of 100. In other words, 100% is 100/100. In some cases, it may be impossible to get over 100%. For example, you can't watch TV more than 100% of your time. This is impossible because 100% is all the time you have.

On the other hand, it is very possible to have percentages over 100%. For example, you may get 100% of the vitamin C you need from eating an orange. But suppose you ate 3 oranges. You would receive 300% of the vitamin C you need for the day.

Part 1 Fill in the table using fractions out of 100

[illegible]	Decimal	Percent
105/100	1.05	105.0%
150/100		
		400.0%
510/100		
	7.02	
900.5/100		

Part 2 Fill in the table using fractions out of 100

Fraction	Decimal	Percent
2005/1000	2.005	200.5%
		301%
	3.582	
4486/1000		
		672.3%
	8.08	
10500/1000		

Name: _____ 51

Curriculum Connection: RS.6

Percents Greater Than 100

Situations can be described as over 100% when we can define what 100 means. For example, an athlete can give more than 100% when we define 100% as how much effort they can give for an entire game. There may be times during the game where the athlete can give 110% when they can rest at 90% during another time.

Part 1 Write your own scenarios that would result in over 100%

	Scenario Using More Than 100%
Ex.1	[illegible] points and I scored 20. I scored 200% more points than Rob.
Ex.2	[illegible] rainfall in April as there was in March.
1)	
2)	
3)	
4)	
5)	

Part 2 Does the scenario make sense?

	Scenario	Yes or No
1)	My workday is 8 hours. I worked 120% of a workday today.	
2)	120% of the world's population has been sick at least once.	
3)	125% of the sky is covered in clouds.	
4)	My investment of $100 has grown 300%!	
5)	There was one birthday cake, and I ate 150% of it!	
6)	The teacher marked 110% of the tests she received.	
7)	You got 110% on a test because you answered the bonus question.	
8)	You sold 20 drinks in the morning and 200% more in the afternoon.	

Name: _____ 57

Sport Statistics - Fractions, Decimals, and Percents

Questions | Baseball Statistics – 2021 Regular Season Offensive Statistics

1) Vladamir Guerrero Jr. had 600 at bats in the 2021 season. His stats are listed in the table below.

	Hits	Runs	Doubles	Triples	Home Runs
Totals – Fraction	188/600	124/600	21/600	1/600	51/600
Decimal					
Percent					

a) If Guerrero had 100 at bats, how many home runs would he have?	
b) If Guerrero had 1000 at bats, how many doubles would he have?	
c) If Guerrero had 50 at bats, how many hits would he have?	
d) Write the probability as a percentage that Guerrero will get a hit at his next at bat?	

2) Bo Bichette had 700 at bats in the 2021 season. His stats are listed in the table below.

	Hits	Runs	Doubles	Triples	Home Runs
Totals – Fraction	195/700	118/700	29/700	1/700	18/700
Decimal					
Percent					

a) If Bichette had 100 at bats, how many home runs would he have?	
b) If Bichette had 1000 at bats, how many doubles would he have?	
c) If Bichette had 50 at bats, how many hits would he have?	
d) Write the probability as a percentage that Bichette will get a home run at his next at bat?	

Name: _____ 60

Curriculum Connection: 8.N.4

Percents Greater Than 100

Part 1 — Fill in the table

	Fraction	Decimal	Percent
1)	$1\frac{1}{2}$	1.50	150%
2)	$2\frac{1}{4}$		
3)		3.50	
4)			475%
5)			
6)			750%
7)			

Part 2 — Convert the fractions to a decimal and

	Fraction	Decimal	Percent
1)	25/20		
2)	50/25		
3)	88/50		
4)	125/100		
5)	200/150		
6)	300/200		
7)	475/325		

Name: _____ 61

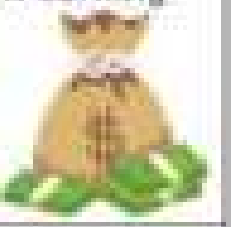
Curriculum Connection: [illegible]

Fractions, Decimals, Percents - Word Problems

Questions | Answer the word problems below

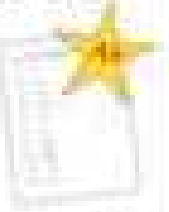
1) Kylie bakes cakes and sells them. It costs her $5 to make a cake. She sells the cake for $18. What percentage is the selling price in comparison to the cost price?

2) Gavin [illegible] an hour. He received a raise from his boss and is now earning $60 [illegible] centage does Gavin earn now in relation to what he [illegible] dollars?

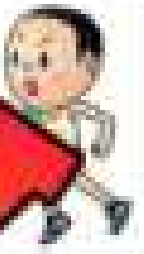


3) Maeve did well on [illegible] all of the 20 questions correct and answered 3 bonus questions correct. [illegible] was her mark as a fraction and percentage?

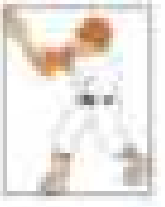
Fraction	Percentage



4) Elliott ran a 10km race last week. The winner finished in [illegible] minutes. It took Elliot 45 minutes. What percentage did Elliot finish in relation to the winner's time?



5) Calvin sold a baseball card for $88. He bought it for $20. How much did Calvin sell it for in relation to what he paid as a percentage?



6) Luke hit the golf ball 200 yards. Scott drove the golf ball 300 yards right after. Write how much further Scott hit the ball than Luke as a fraction, decimal, and percent.

Fraction	Decimal	Percent

Name: _____ 70

Comparing Two Quantities

Part 1 Use the <, >, = to make the statements true

1)	$8 + 7 \times 2$	☐	$9 + 2 \times 5$	6)	$25 - 7 \times 3$	☐	$\frac{9^2}{9} + 2$
2)	$11 - 5$	☐	$7 \times 7 - 20$	7)	$3^3 + 9 \times 4$	☐	$48 - 22 \times 2$
3)	15×2	☐	$7 - 10 + 3$	8)	$62 - 5^2 \times 2$	☐	$(6 + 4) \times 2$
4)	$\frac{25}{5} + (10 + 5)$	☐		9)	$\frac{48}{12} + (4)(8)$	☐	$4^2 + 5 \times 2$
5)	$\frac{108}{3^2} \times 8$	☐	$8 + 8 \times 2$	10)		☐	$15 + 7 \times (2 + 6)$

Part 2 Answer the word problems b

1) Parker had $500 in his bank account. He made 5 [illegible] What is the balance of his account now? Write an expression that [illegible] problem.

2) Use the following numbers/operations to write 5 different expressions. Use all 3 numbers in each expression. Consider using brackets and exponents.

2 10 3 x - + ÷

1)	
2)	
3)	
4)	
5)	

Name: ______________________ 71

Expressions Written As Fractions

When we solve an expression that is written as a fraction, we follow these steps:

1) Evaluate the numerator
2) Evaluate the denominator
3) Divide the denominator by the numerator

Example

$$\frac{2+8(2)}{15-6} = \frac{2+(16)}{15-6} = \frac{18}{9} = 2$$

Questio[illegible] Solve the expressions using BEDMAS

1) $\frac{[illegible]}{[illegible]1(2)}$

2) $\frac{24-6(2)}{2^2}$

3) $\frac{30+8^2}{5^2-11(2)-1}$

4) $\frac{24-8(2)}{2^2}$

5) $\frac{7+8+[illegible]}{35-[illegible]}$

6) $\frac{12(2)+24}{[illegible](2)}$

7) $\frac{3+9+6(5)}{21\div 3}$

8) $\frac{28+8\div 2}{3(4)-4}$

9) $\frac{16+8(5)}{(5)(5)-18}$

Name: _____ 72

Expressions as Fractions - The Canteen

Questions | Write expressions written as a fraction

A canteen sells drinks, chips, and gummies. The prices are displayed in the table below.

Candy	Price
Drinks	$3
Gummies	$2
Chips	$4

1) Sara[illegible] the canteen last Monday. They sold 6 bags of chips and 6 drinks.

Write an expressi[illegible] much money they earned and how much each person will get [illegible] equally.

2) Mark, Dan, Chris, Hugh and Lucas ran the [illegible] sold 9 drinks, 5 gummies, and 2 bags of chips.

Write an expression that represents how much money [illegible] much each person will get if they divide the earnings equally.

3) On a busy day for the canteen, 8 friends ran the canteen. They sold 12 drinks, 10 gummies, and 12 bags of chips.

Write an expression that represents how much money they earned and how much each person will get if they divide the earnings equally.

Name: _____ 73

Adding Square Roots

We can simplify expressions with square roots by evaluating the square root and performing the addition operation afterwards.

Example 1
$\sqrt{9} + \sqrt{25}$
$= 3 + 5$
$= 8$

Example 2
$\sqrt{22 + 27}$
$= \sqrt{49}$
$= 7$

Example 3
$\sqrt{40 + \sqrt{81}}$
$= \sqrt{40 + 9}$
$= \sqrt{49}$
$= 7$

Example 4
$\sqrt{\sqrt{49} + \sqrt{100}}$
$= \sqrt{7 + 10}$
$= \sqrt{17}$
$= 4.12$

Que the expressions below

1) $\sqrt{16} + \sqrt{4}$	2) $\sqrt{\quad} + 13$	3) $\sqrt{81} + \sqrt{64}$
4) $\sqrt{8 + \sqrt{64}}$	5) $\sqrt{\sqrt{25} + 20}$	6) $\sqrt{5 + \sqrt{81}}$
7) $\sqrt{\sqrt{36} + \sqrt{100}}$	8) $\sqrt{\sqrt{100} + 111}$	9) $\sqrt{\sqrt{49}}$
10) $\sqrt{144} + \sqrt{100}$	11) $\sqrt{\sqrt{4} + \sqrt{49}}$	12) $\sqrt{95 + 26}$

Name: _____ 78

Multiplying & Dividing By Powers of 10

Directions:
When multiplying by a power of 10, simply move the decimal to the right the same number of zeros. If expressed as a power of 10, move the decimal right the same number as the exponent.
If dividing by a power of 10, move the decimal to the left in the same way as multiplying.

Remember that all whole numbers have a decimal at the end, but we usually don't show it because there are no values after.

$0.5 \times 10 =$	$5.0 \div 10 = 0.5$	$50.0 \times 10^5 = 5{,}000{,}000$	$50.0 \div 10^5 = 0.0005$

Part 1 Fill in the table below

	Number			$\times 10^3$	$\times 10^5$	$\times 10^7$
1)	0.2					
2)	0.08					
3)	75					
4)	235					
5)	42.71					
6)	0.0012					
7)	712.4					

Part 2 Fill in the table below

	Number	$\div 10$	$\div 10^2$	$\div 10^4$	$\div 10^5$	$\div 10^8$
1)	0.3					
2)	0.08					
3)	23					
4)	438					
5)	1.28					
6)	4868.2					
7)	84187					

Name: _____ 85

Golf - Adding Integers - Zero Pairs

Word Problems Solve the word problems below using counter chips.

1) Bailey played 3 rounds of golf. She filled out her scorecard, but she forgot what she shot in round 2. Fill it in for her.

Round	Score
1	-6
2	
3	+9
Total Score	+10

Equation: _____ + _____ = _____

2) Ryker played [illegible] rounds of golf. His final scores for all three rounds are on the scorecard. What is his total score?

Round	Score
1	-13
2	-8
3	+11
Total Score	

Equation: _____ + _____ + _____ + _____

3) Sara played 4 rounds of golf. Her final scores are on her scorecard, but she can't remember what she scored on her first round. Help her by completing her score card.

R1	R2	R3	R4	Total Score
	3	-6	-5	-17

Equation: _____ + _____ + _____ + _____ + _____

4) Jason played 4 rounds of golf. His final scores are written on the scorecard. What is his total score?

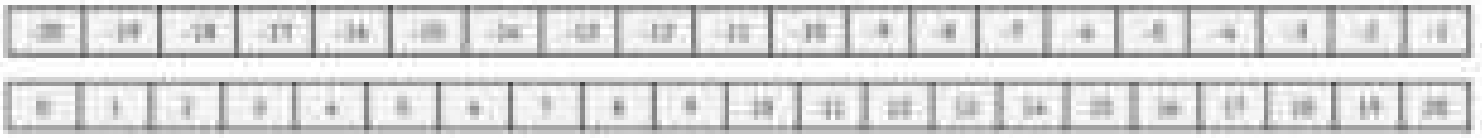
R1	R2	R3	R4	Total Score
-11	-6	8	-7	

Equation: _____ + _____ + _____ + _____ + _____

Name: _____ 86

Curriculum Connection: 8.NS.A

Adding Integers - Using Number Lines

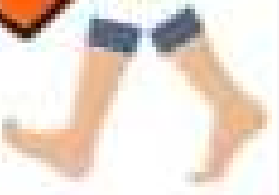


Part 1 Solve the questions below

1) 9 + (-4) + 3	6) -35 + 21 + (-17)
2) 1[illegible]	7) 17 + (-25) + (-11)
3) -17 + 30 + (-[illegible]	8) -10 + (-10) + 35 + (-12)
4) 20 + (-32) + (-7)	[illegible]0) + (-7) + (22)
5) -18 + 20 + (-21)	[illegible] + (-[illegible]33

Part 2 Answer the word problems below. Write the [illegible]on

1) You take 19 steps forwards, 29 steps backwards, another 10 [illegible]wards, and another 31 steps forwards. How many steps have you taken[illegible]



2) A submarine starts at sea level and dives 52m down before coming up 16m. It makes another plunge down 39m and then rises 14m. How many meters is it below sea level?

Name: _____ 89

Curriculum Connection: 8.N.4

Subtracting Integers - Number Line

Follow these steps to use a number line for solving subtraction questions involving integers.

1) Determine how far the numbers are on a number line (25 and -35 has a distance of 60 in total – magnitude of 60)
2) The direction you move **from** the **second** number to the **first** number will tell you which sign to use. When we move left, we are moving in a negative direction (-) and when we move right, we are moving in a positive direction (+)

Ex. 25 – (-35) = 60

Distance = 60
Moving right = +60

Questions

Use the number lines to solve the questions

1) (-30) – (-16) =

2) 25 – (-25) =

3) (-20) – 10 =

4) (-35) – 19 =

5) 31 – (-37) =

6) (-38) – (-22) =

7) 40 – (-36) =

Name: _____ 90

Subtracting Integers - Number Line

Part 1 Solve the questions below

1) 27 - [illegible] =	6) (-35) - 22 =
2) [illegible]	7) 27 - (-16) =
3) (-23) - 31 =	8) (-38) - (-15) =
4) 36 - (-17) =	[illegible] (+13) =
5) (-39) - 18 =	[illegible]

Part 2 Answer the word problems below. Write the [illegible] ion

1) The winner of a golf tournament scored a -21 after four rounds. The [illegible] place golfer scored a +47. What is the difference between these two scores?

2) Dan and Brianna both invested some of their money in the stock market. Dan lost -$386 and Brianna earned +$521. What is the difference between their earnings and loses?

Name: _____ 94

Multiplication Squares

Part 1 Fill in the squares by multiplying the integers

1)

x	5	-8
-3		
-7		

2)

x	2	-9
-8		
-6		

3)

x	7	-1
-9		
-3		

4)

x	-3	
-8		
6		

	-7	-10

6)

x	12	-6
-4		
9		

7)

x	-15	-13
-3		
-5		

8)

x	-6	
-4		
7		

	23	-56

Part 2 Fill in the squares by multiplying the integers

1)

x	6	-5	2
-4			
-7			
3			

2)

x	10	-11	12
-3			
-7			
-9			

3)

x	-5	15	-25
-2			
-4			
6			

Name: _____ 95

Integer Multiplicati Chart

Directions Fill in the chart by multiplying the integers

x	-5	-4	-3	-2	-1		2	3	4	5
5										
4										
3										
2										
1										
0										
-1										
-2										
-3										
-4										
-5										

Name: _____ 96

Dividing Integers - Number Line

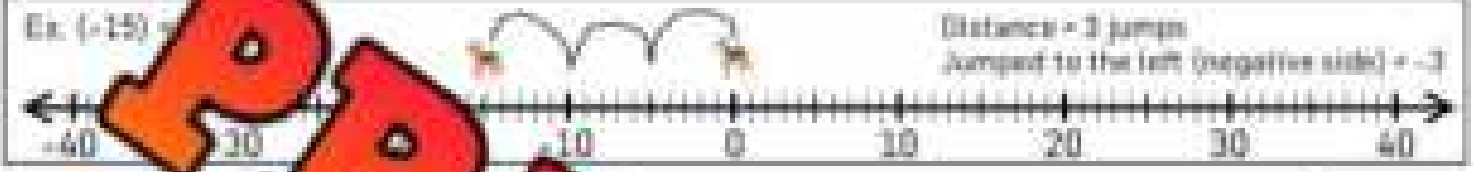
Follow these steps to use a number line for solving division questions involving integers.

Dividend → (-15) ÷ 5 = 3 ← Quotient

Divisor

1) The dog always starts at 0
2) The dog jumps by the divisor until it reaches the dividend
3) Your answer is how many jumps it takes
4) The answer is negative if the dog faces the negative side and positive if it faces the positive side

Ex. (-15) ÷ 5 =



Distance = 3 jumps
Jumped to the left (negative side) = -3

Questions

Use the number lines to solve the questions

1) (-25) ÷ (-5) =

2) 12 ÷ (-4) =

3) (-32) ÷ 4 =

4) (-18) ÷ (-6) =

5) 24 ÷ (-8) =

6) (-36) ÷ (-3) =

Name: _____ 115

Adding Fractions with Common Denominators

Questions | Solve the word problems

1) At the end of the birthday party, there were 4 pizza boxes left. The first box had 5/8 slices left. The second box had 3/8 slices left. The third box had 4/8 slices remaining and the last box had 6/8 left.

a) How much pizza is left in total?

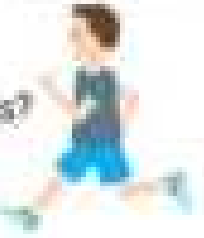
b) How many whole pizzas are left?

c) How many pizzas were eaten if there were 8 slices in each box?

2) Thomas is starting to practice running. The distances he ran are presented in the table.

Day	Distance (km)
Monday	3/8
Tuesday	6/8
Wednesday	$1\frac{5}{8}$
Thursday	$2\frac{4}{8}$
Friday	21/8

a) How far did he run after the 5 days?

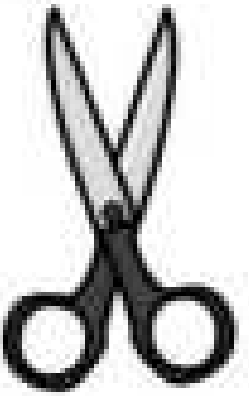


b) Which day did he run the most?

3) Shelly bought $\frac{10}{6}$ metres of red fabric, $1\frac{7}{6}$ metres of blue fabric, and $\frac{5}{6}$ metres of green fabric.

a) How much fabric did she buy in total?

b) Which colour of fabric did she buy the most of?



Name: _____ 116

Curriculum Connection: 6.N.5

Adding Mixed Fractions

When adding a mixed fraction, we have two options we can use to solve.
1) We can keep the wholes and add them together first and then add the fractional parts after.
2) We can convert the mixed fractions to improper fractions and then add them

Part 1

Add the mixed fractions together using option 1

Ex) $3\frac{2}{9}$	1) $6\frac{2}{3} + 3\frac{1}{3} =$	2) $5\frac{3}{9} + 11\frac{5}{9} =$
3) $8\frac{4}{8} + 5\frac{3}{8} =$		5) $2\frac{4}{5} + 6\frac{3}{5} =$
6) $12\frac{5}{9} + 10\frac{8}{9} =$	7) $8\frac{9}{12}$ [illegible]	$15\frac{8}{10} + 3\frac{4}{10} =$

Part 2

Add the mixed fractions together [illegible]

Ex) $3\frac{2}{8} + 7\frac{4}{8} = \frac{26}{8} + \frac{60}{8} = \frac{86}{8}$ or $10\frac{6}{8}$	1) $3\frac{4}{8} + 4\frac{2}{8} =$
2) $6\frac{1}{4} + 8\frac{2}{4} =$	3) $11\frac{7}{9} + 7\frac{5}{9} =$
4) $10\frac{8}{11} + 9\frac{5}{11} =$	5) $12\frac{6}{14} + 6\frac{11}{14} =$

Name: _____ 120

Cooking with Fractions - Adding

Questions | Solve the word problems

1) Alice baked 100 pies last month. Of the 100 pies, $\frac{1}{5}$ were blueberry, $\frac{2}{10}$ were apple, and $\frac{2}{20}$ were peach.

a) What fraction of pies were blueberry, apple, or peach?

b) How [illegible] the pies were either blueberry, apple, or peach?

2) Melanie se[illegible] Last month, $\frac{3}{6}$ of the customers bought chocolate donuts, [illegible] and $\frac{2}{6}$ bought caramel donuts.

What fraction of customer[illegible] vanilla or caramel donuts?

3) Ruben owns a restaurant. He likes to kee[illegible] of [illegible] customers are buying. His top 3 sellers are sandwiches, salad[illegible] $\frac{2}{8}$ of his customers buy a sandwich, $\frac{3}{8}$ buy a salad, and $\frac{2}{8}$ buy a [illegible]

What fraction of customers buy one of his top 3 sellers?

4) Evan has 4 methods of payment for his restaurant. He accepts credit cards, debit cards, cash, and cheque. Out of his last 100 customers, $\frac{3}{6}$ paid with a credit card, $\frac{1}{3}$ paid with a debit card, and $\frac{2}{9}$ paid with cash.

a) What fraction of customers paid with credit, debit, or cash?

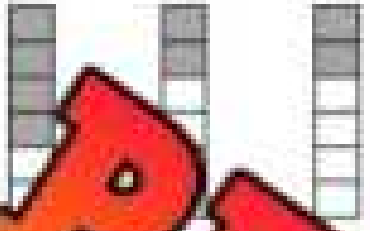
b) What fraction paid with a cheque?

Name: _____ 121

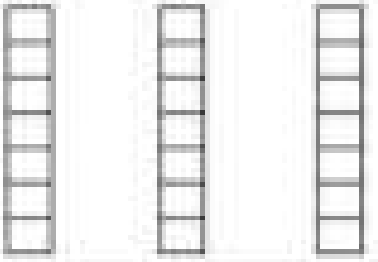
Subtracting Fractions - Common Denominators

Questions Subtract the fractions below using the models

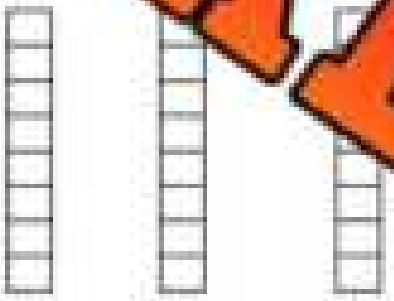
1) $\frac{4}{6} - \frac{2}{6} = \frac{2}{6}$



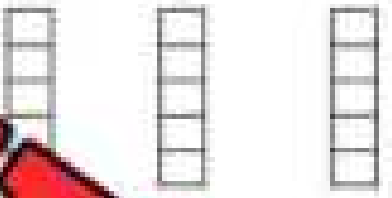
2) $\frac{6}{7} - \frac{3}{7} = \_\_$



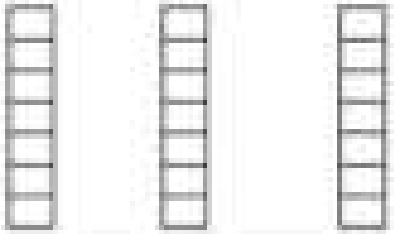
3) $\frac{}{8} - \_\_ = \_\_$



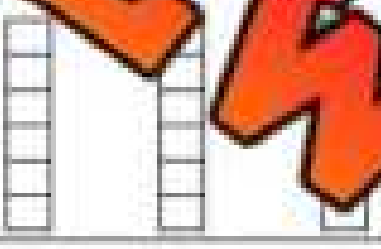
4) $\frac{3}{5} - \frac{1}{5} = \_\_$



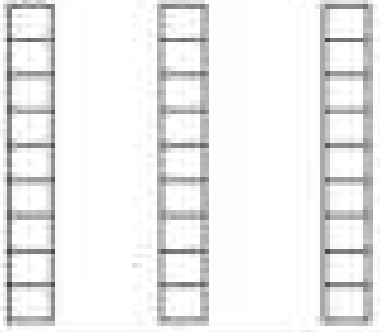
5) $\frac{6}{7} - \frac{3}{7} = \_\_$



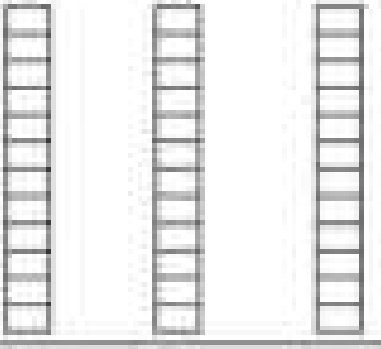
6)



7) $\frac{7}{9} - \frac{4}{9} = \_\_$



8) $\frac{10}{12} - \frac{7}{12} = \_\_$



Name: _____ 123

Subtracting Fractions - Word Problems

Questions Solve the word problems

1) Drew ran $4\frac{3}{4}$ km yesterday in 20 minutes. Lindsay ran $\frac{18}{4}$ km yesterday in 20 minutes.

a) Who ran further in the 20 minutes?

b) How [illegible]ther did they run?

2) Baker found [illegible] a black snake in his backyard. The green snake was $22\frac{1}{3}$ cm [illegible] black [illegible] was $\frac{83}{3}$ cm long.

a) Which snake is [illegible]

b) How much longer is the [illegible]

3) Ayden picked $3\frac{3}{5}$ baskets of strawberries [illegible] baskets of strawberries.

a) Who picked more strawberries?

b) How much more did they pick?

4) Sharon has practiced playing the piano for $2\frac{2}{3}$ hours this week. She wants to practice for $\frac{25}{3}$ hours.

a) How much more time does she need to practice?

b) If she wants to practice for 10 hours, how much longer does she need to practice?

Name: _____ 127

Subtracting Mixed Fractions

When subtracting a mixed fraction, we have two options we can use to solve.
1) We can keep the wholes and subtract them first and then subtract the fractional parts after.
2) We can convert the mixed fractions to improper fractions and then subtract.

Part 1 — Add the mixed fractions together using option 1

Ex) [illegible]	1) $8\frac{4}{6} - 5\frac{1}{6} =$	2) $3\frac{7}{9} - 1\frac{5}{9} =$
3) $7\frac{5}{7} - 3\frac{3}{7} =$		5) $4\frac{6}{8} - 1\frac{3}{8} =$
6) $12\frac{9}{13} - 10\frac{8}{13} =$	7) $13\frac{1}{15} - [illegible] =$	$15\frac{9}{10} - 8\frac{4}{10} =$

Part 2 — Add the mixed fractions together [illegible]

Ex) $6\frac{7}{8} - 2\frac{3}{8} = \frac{55}{8} - \frac{19}{8} = \frac{36}{8}$ or $4\frac{4}{8}$	1) $8\frac{7}{9} - 4\frac{3}{9} =$	
2) $7\frac{4}{5} - 3\frac{2}{5} =$	3) $13\frac{8}{11} - 6\frac{3}{11} =$	
4) $10\frac{13}{13} - 8\frac{6}{13} =$	5) $15\frac{12}{14} - 9\frac{9}{14} =$	

Name: _____ 129

Repeated Addition & Multiplying Fractions

Part 1 Add and multiply the fractions below

Addition Version	Multiplication Version
1) $\frac{4}{7}+\frac{4}{7}+\frac{4}{7}+\frac{4}{7}+\frac{4}{7}=\frac{20}{7}$ or $2\frac{6}{7}$	$5 \times \frac{4}{7}=\frac{20}{7}$ or $2\frac{6}{7}$
2) $\frac{1}{9}+\frac{1}{9}$ [illegible] $+\frac{1}{9}+\frac{1}{9}+\frac{1}{9}+\frac{1}{9}=$	
3) $\frac{2}{9}$ [illegible]	
4) $\frac{3}{8}+\frac{3}{8}+\frac{3}{8}$ [illegible] $+\frac{3}{8}+$	
5) $\frac{4}{9}+\frac{4}{9}+\frac{4}{9}+\frac{4}{9}+\frac{4}{9}+$	
6) $\frac{3}{10}+\frac{3}{10}+\frac{3}{10}+\frac{3}{10}+\frac{3}{10}+\frac{3}{10}+\frac{3}{10}=$	
7) $\frac{3}{7}+\frac{3}{7}+\frac{3}{7}+\frac{3}{7}+\frac{3}{7}+\frac{3}{7}+\frac{3}{7}=$	

Part 2 Answer the word problems below using an addition and multiplication sentence

1) Jerry made 5 pizzas. Each of the pizzas have 2/7 cups of cheese. How much cheese do all 5 pizzas have in total?

Addition Sentence	Multiplication Sentence

2) Helen buys 9 bags of chips. Each bag is 4/9 of a kg. How many kilograms are all 9 bags combined?

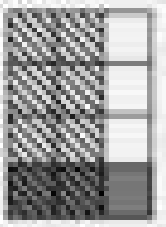
Addition Sentence	Multiplication Sentence

Name: _____ 136

Multiplying Fractions - Area Models

We can represent two fractions using the same area model. Doing so will allow us to determine the product when we multiply two fractions together.

$\frac{2}{3} \times \frac{1}{4} = \frac{2}{12}$



Example

Step 1: Divide the area model into thirds horizontally to represent 2/3

Step 2: Draw diagonal lines that fill in two-thirds of the area model

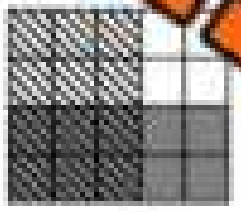
Step 3: Divide the area model into fourths vertically to represent 1/4

Step 4: Shade one-fourth of the area model

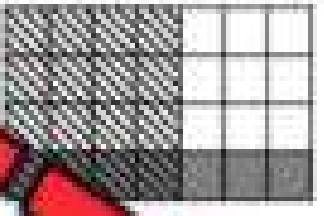
Step 5: Determine how many squares overlap compared to the total number of squares

Questions Find the product using the area model. Steps 1-4 have been done for you

1)

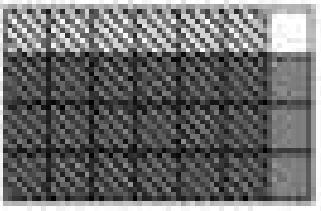


$\frac{3}{5} \times \frac{2}{4} = \_\_\_$



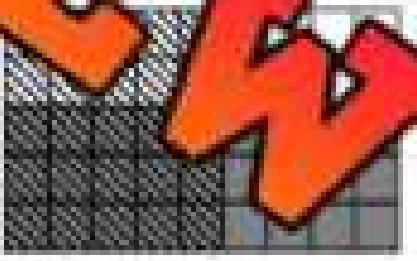
$\frac{}{} \times \frac{}{} = \_\_\_$

3)



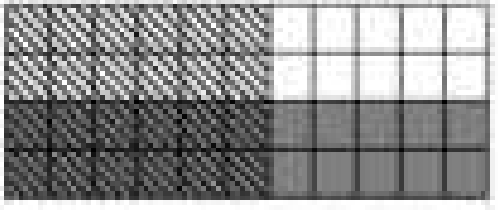
$\frac{6}{7} \times \frac{3}{4} = \_\_\_$

4)



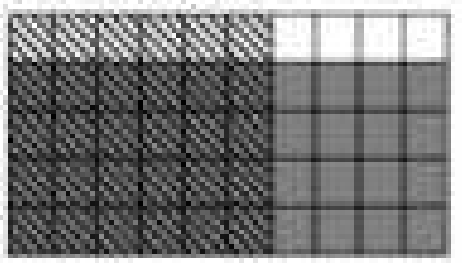
$\frac{5}{9} \times \frac{3}{5} = \_\_\_$

5)



$\frac{6}{11} \times \frac{2}{4} = \_\_\_$

6)



$\frac{8}{10} \times \frac{4}{5} = \_\_\_$

Name: _____ 142

Curriculum Connection: 4.5.6

Multiplying Mixed Fractions

How to multiply mixed fractions

1) Convert the mixed fractions to improper fractions
2) Multiply the improper fractions
3) Convert the improper fraction back to a mixed fraction
4) Simplify if necessary

$2\frac{2}{3} \times 2\frac{2}{4} = \frac{8}{3} \times \frac{10}{4} = \frac{80}{12}$ or $6\frac{8}{12}$ or $6\frac{3}{6}$

Part 1 Find the products of the fractions below. Simplify the fractions.

1) $3\frac{1}{3} \times 2\frac{2}{4} =$	2) $4\frac{2}{5} \times 7\frac{5}{6} =$
3) $5\frac{1}{2} \times 6\frac{3}{7} =$	4) $9\frac{2}{4} \times 4\frac{7}{9} =$
5) $10\frac{5}{7} \times 7\frac{2}{3} =$	6)
7) $12\frac{3}{5} \times 5\frac{2}{3} =$	8) $8\frac{}{9}$

Part 2 Answer the word problems

1) Hadley ran $3\frac{1}{5}$ km. Freya ran $2\frac{2}{3}$ km times further. How far did Freya run?

2) Parker made tomato and chicken noodle soup. He made $2\frac{3}{4}$ kg of tomato soup and $4\frac{6}{3}$ times more chicken noodle soup. How much chicken noodle soup did he make?

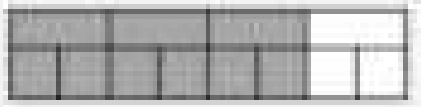
Name: _____ 147

Dividing Fractions Using Models

Dividing Fractions
We can use a bar model to compare fractions to make it easier to divide.

Solution – We can see that 1/8 fits into 3/4 six times.

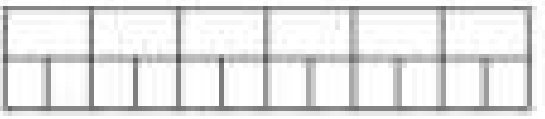
$\frac{3}{4} \div \frac{1}{8} = 6$



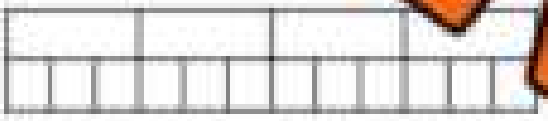
Questions Shade in the fraction bars. How many times does the divisor fit into the dividend.

1) 

$\frac{1}{5} \div \frac{1}{10} =$ ____

2) 

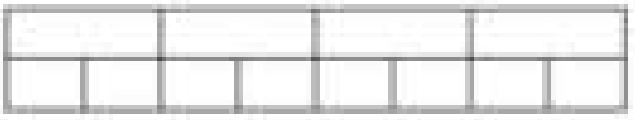
$\frac{5}{6} \div \frac{1}{12} =$ ____

3) 

$\frac{2}{4} \div \frac{1}{12} =$ ____

4) 

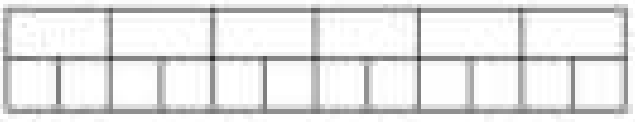
$\frac{1}{2} \div \frac{1}{6} =$ ____

5) 

$\frac{3}{4} \div \frac{1}{8} =$ ____

6) 

$\frac{1}{3} \div \frac{1}{9} =$ ____

7) 

$\frac{5}{6} \div \frac{1}{12} =$ ____

8) 

$\frac{1}{3} \div \frac{1}{12} =$ ____

Name: _____ 149

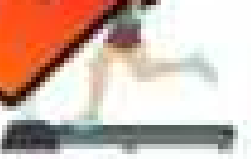
Dividing Fractions - Word Problems

Questions Find the answers of the fractions below

1) Howard can run a kilometre in 2/8 of an hour. How many kilometres can he run in 3/4 of an hour?

2) Jayce bou[illegible] sandwich that is 9/10 of a metre long. He wants to cut it [illegible] that are 3/30 of a metre long. How many sandwiches will he [illegible]?

3) Hugh has a goal of exercising 12/4 hours [illegible] several runs today. His runs take him 4/6 of an hour. How many [illegible] Hugh [illegible] go on?



4) Zara loves to read. She can read a book in 2/7 of an hour. If she only had 10/12 of an hour to read, how many books could she read?

Name: _____ 150

Curriculum Connection: 6.N.4

Dividing Mixed Fractions

How to divide mixed fractions

1) Convert the mixed fractions to improper fractions
2) Use the Keep, Switch, Flip (K,S,F) method to change the question to multiplication
3) Convert the answer back to a mixed fraction and simplify if necessary

Question	Improper	K, S, F	Answer	Simplified
$4\frac{2}{3} \div 3\frac{1}{5}$	$\frac{14}{3} \div \frac{16}{5}$	$\frac{14}{3} \times \frac{5}{16} = \frac{70}{48}$	$1\frac{22}{48}$	$1\frac{7}{24}$

Part 1 Find the answers of the fractions below. Simplify the fractions.

Question	Improper	K, S, F	Answer	Simplified
1) $6\frac{3}{4} \div 2\frac{2}{5}$				
2) $5\frac{4}{6} \div 4\frac{1}{3}$				
3) $8\frac{2}{6} \div 3\frac{3}{4}$				
4) $7\frac{4}{5} \div 4\frac{1}{6}$				
5) $6\frac{1}{4} \div 3\frac{2}{3}$				
6) $8\frac{1}{4} \div 2\frac{5}{7}$				

Part 2 Answer the word problem

Jasper ordered $5\frac{4}{5}$ loads of mulch to fill gardens around his property. Each garden requires $1\frac{2}{4}$ loads of mulch. How many gardens can he fill with mulch?

Name: ____________________ 156

Ratio In 3 Ways

Part 1 Write the ratios for the questions below

1) Ratio of 35 balls to 78 strikes	Words: ______ Ratio: ______ Fraction: ______
2) Ratio [illegible] dunk[illegible] point[illegible]	[illegible] [illegible] [illegible]n: ______
3) Ratio of 10 cars to 3 trucks	Word[illegible] Ratio: ______ Fraction: ______
4) Ratio of 2 coffees to 6 waters	Words: ______ Ratio: ______ Fraction: ______
5) Ratio of sitting for 30 minutes to standing for 60	Words: ______ Ratio: ______ Fraction: ______
6) Ratio of 1 grade 8 to 1 grade 7	Words: ______ Ratio: ______ Fraction: ______
7) Ratio of 3 [illegible] to 1 shot	Words: ______ Ratio: ______ Fraction: ______
[illegible] heal[illegible]	______ ______ ______

Part 2 Answer the word problems below

1) A baseball pitcher threw a ratio of 1 ball to 3 strikes. The pitcher threw 75 strikes. How many balls did they throw?

2) A hockey player has a ratio of 1 goal for every 8 shots they took. The player scored 5 goals today. How many shots did they take?

Name: _____ 159

Ratios - Word Problems

Questions | Answer the word problems below

1) There are 27 students in a grade 8 class. The ratio of boys to girls is 5:4.

a) Write the ratio in words and as a fraction.

b) How many boys are in the class?

c) How many girls are in the class?

2) A car dealership has [illegible] cars. The ratio of cars to vans to trucks is – 10:4:6.

a) How many cars do they have?

b) How many vans do they have?

c) How many trucks do they have?

3) A banquet hall has 15 tables. The ratio of tables to chairs is 15:90.

a) How many chairs are there at each table?

b) The banquet hall bought 12 more tables. How many more chairs will they need?

Name: _____ 160

Proportional vs Non-Proportional Relationships

A **proportional relationship** is when two variables change at the same rate.

Example – 1 cookie per 1 student (1/1) is proportional to 10 cookies per 10 students (10/10). Both variables (cookie and student), were multiplied by the same number – 10.

A **non-proportional relationship** is when two variables do not change at the same rate.

Example – $100 per 1 month (1/100) is different than $500 per 7 months (500/7)

Question: Are the relationships proportional or non-proportional?

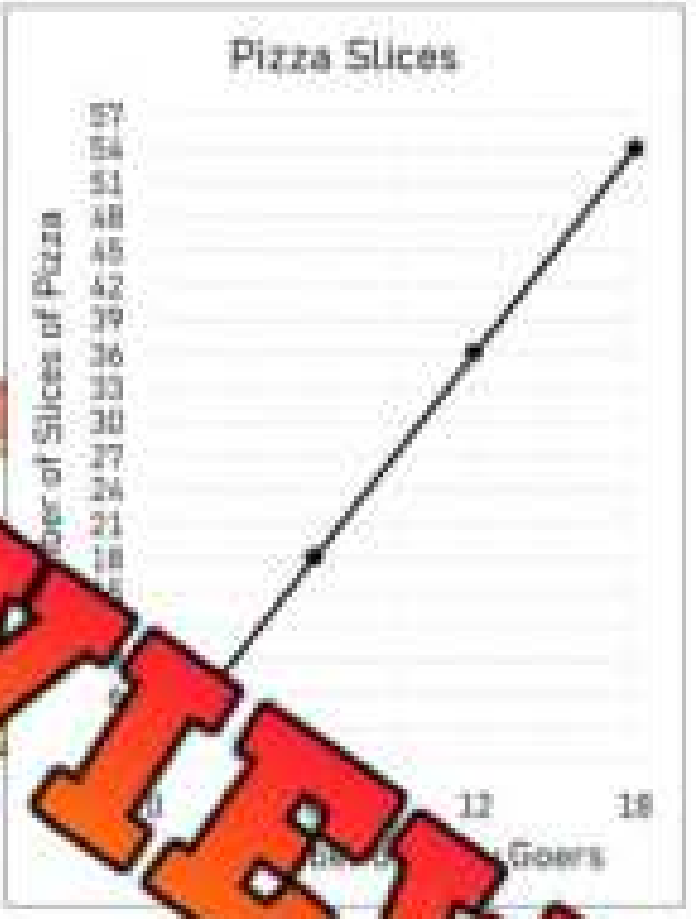
1) $\frac{}{2}$ and $\frac{18}{}$ Proportional Non-Proportional	2) $\frac{2}{6}$ and $\frac{5}{15}$ Proportional Non-Proportional
3) $\frac{14}{5}$ and $\frac{98}{35}$ Proportional Non-Proportional	$\frac{3}{}$ and $\frac{75}{125}$ Non-Proportional
5) $\frac{5}{8}$ and $\frac{45}{64}$ Proportional Non-Proportional	Proportional
7) $\frac{12}{7}$ and $\frac{84}{56}$ Proportional Non-Proportional	8) $\frac{7}{3}$ and $\frac{210}{90}$ Proportional Non-Proportional
9) $\frac{60}{7}$ and $\frac{300}{35}$ Proportional Non-Proportional	10) $\frac{8}{17}$ and $\frac{56}{102}$ Proportional Non-Proportional
11) $\frac{9}{22}$ and $\frac{54}{132}$ Proportional Non-Proportional	12) $\frac{15}{35}$ and $\frac{120}{245}$ Proportional Non-Proportional

Name: _____ 165

Proportional Relationship - Pizza Party

Questions | Solve the problem below

Reagan is buying pizza for a pizza party. She wants to have 3 slices of pizza for each person coming to the party. The graph below represents the relationship between the number of slices of pizza and the number of party goers.



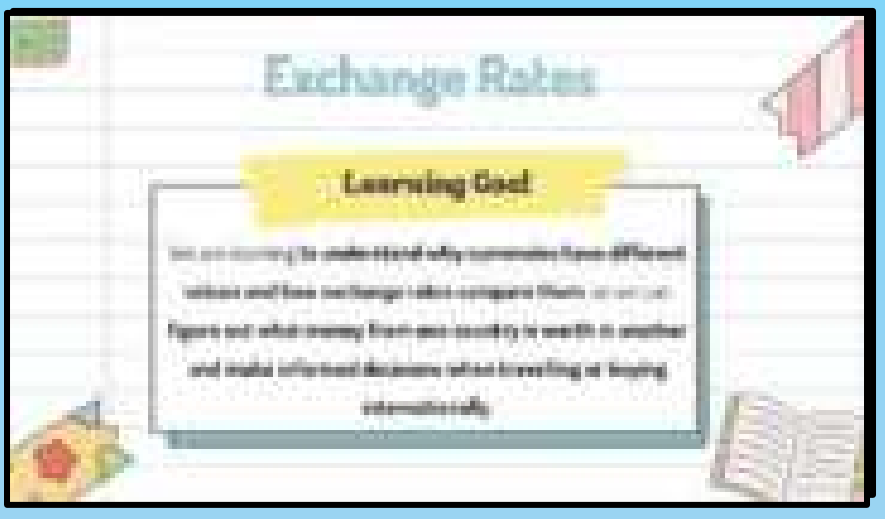
1) Is the graph proportional or non-proportional?	
2) What is the unit rate? (number of slices per person)	
3) How many pizza slices would she need for 9 people?	
4) Reagan bought 63 slices of pizza. How many people is she expecting?	
5) Use the graph to determine how many pizza slices she would need for 13 people?	
6) Use the graph to determine how many slices she would need for 17 people?	
7) If Reagan bought 147 slices of pizza, how many people was she expecting?	

Google Slides Lessons Preview

Ontario Math Curriculum
Financial Literacy – Grade 8

3-Part Lesson Format

Part 1 – Minds On!
- Learning Goals
- Discussion Questions
- Quotes
- And More!



Part 2 – Action!
- Writing
- Matching
- Drag and Drop
- Drawing
- And More!

Part 3 – Consolidation!
- Exit Cards
- Quizzes
- Reflection
- And More!

Ontario Math Curriculum
Financial Literacy – Grade 8

Ontario Math Curriculum
Financial Literacy – Grade 8

Workbook Preview

Grade 8
F1. Money and Finances

	Curriculum Expectations	Pages That Cover the Expectations
F1.1	describe some advantages and disadvantages of various methods of payment that can be used when dealing with multiple currencies and exchange rates	5 – 24
F1.2	create a financial plan to reach a long-term	
F1.3		
F1.4	determine the growth of simple and compound interest at various rates using digital tools, and explain the impact interest has on long-term financial planning	45 – 60
F1.5	compare various ways for consumers to get more value for their money when spending, including taking advantage of sales and customer loyalty and incentive programs, and determine the best choice for different scenarios	61 – 66
F1.6	compare interest rates, annual fees, and rewards and other incentives offered by various credit card companies and consumer contracts to determine the best value and the best choice for different scenarios	67 – 74

Name: _____ 5

Exchange Rates - Intro

There are 180 different currencies that are recognized in the world. Every currency is valued differently. This means that a lot of money in one currency could be worth very little in another. For example, if you took one dollar in Canadian money to Japan, it would be worth 90 Japanese Yen.

Exchange rates keep track of how much money is worth. A rate compares two or more currencies together. Therefore, the exchange rate between a Canadian Dollar and Japanese Yen is 1 CAD to 90 JPY.

Part 1 Answer the questions below

1) Why do you need to know exchange rates?

2) How much do you think a candy bar would cost in Japan? Explain your answer.

Part 2 Convert money between CAD and Yen using multiplication and division

	Canadian Dollar	Japanese Yen
1)	$1	
2)	$2	
3)	$10	
4)	$50	
5)	$200	
6)	$10,000	

	Japanese Yen	Canadian Dollar
1)	¥720	
2)	¥990	
3)	¥3600	
4)	¥5400	
5)	¥9000	
6)	¥900,000	

Name: _____ 6

World Currency Exchange Rankings

Out of the 180 currencies worldwide, each one has their own value. This means that 1 dollar is worth a lot more and a lot less in different currencies. The list below is of the top 10 currencies worldwide.
One value of each currency can be exchanged for the money shown in CAD.
This means for every Kuwaiti Dinar, you would exchange it for $4.14 Canadian [illegible]. If you had 1 US Dollar, you would exchange it for $1.25 Canadian [illegible].

[illegible] changes all the [illegible] in [illegible] by the second [illegible] of country's [illegible] the value of their [illegible] in a country earn a lot [illegible] country will have a stronger [illegible] and therefore, a higher value.

Rank	Currency	CAD Rate
1)	Kuwaiti Dinar	$4.14
2)	Bahraini Dinar	$3.31
3)	Omani Rial	$3.24
4)	Jordanian Dinar	$1.76
5)	British Pound Sterling	$1.70
6)	Cayman Islands Dollar	$1.50
7)	European Euro	$1.44
8)	Swiss Franc	$1.34
9)	US Dollar	$1.25
10)	Canadian Dollar	$1.00

Part 1 — Answer the question below

If you could have 100 of any of these currencies, [illegible] would you choose? Explain your choice.

Part 2 — Convert money from other currencies to Canadian Dollars (CAD)

	Money	Other Currency	CAD
1)	$3	Swiss Franc	
2)	$5	US Dollar	
3)	$7	Cayman	
4)	$10	Euro	
5)	$20	Kuwaiti Dinar	

	Money	Other Currency	CAD
6)	$2	British Pound	
7)	$6	Bahraini Dinar	
8)	$25	US Dollar	
9)	$150	Omani Rial	
10)	$500	Jordanian Dinar	

Name: _____ 7

Converting Currencies

The table displays the top 5 used currencies around the world. The Canadian Dollar is number 6. If you converted one Canadian Dollar into the other currencies, you would get the money shown in the table.
For example, 1 CAD will be exchanged for $0.80 USD (80 cents).

Rank	Currency ($1 CAD To)	$
1)	US Dollar	$0.80
2)	Euro	€0.70
3)	Japanese Yen	¥90.00
4)	Pound Sterling	£0.60
5)	Australian Dollar	$1.10

Part 1 How much CAD to other currencies

	CAD	Other Currency	$
1)	$10	US Dollar	
2)	$75	Euro	
3)	$120	Japanese Yen	
4)	$1000	Pound Sterling	
5)	$5000	Australian Dollar	

	CAD	Other Currency	$
6)	$5.50	US Dollar	
7)	$32.75	Euro	
8)	$41.82	Japanese Yen	
9)	[illegible]	Pound Sterling	
10)	[illegible]	Australian Dollar	

Part 2 Answer the questions below

1) Ella spent $24.50 CAD on a t-shirt in Berlin, Germany. How much was the t-shirt in Euros?

2) Levi is going on vacation to Glasgow, Scotland. He converted $2000 CAD to Pounds Sterling. How much should he get in return?

3) Sofia bought a boomerang from Australia online. She paid $48.25 CAD. How much was the boomerang in Australian Dollars?

4) Elena bought a kimono from an online store based out of Japan. She paid $136.32 CAD. How much was the kimono listed for in Yen on the Japanese website?

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

a) Convert the CAD to other currencies

CAD	Other Currency	$
$2234	Japanese Yen	
$99.90	Euro	
$6840.98	Australian Dollar	
$2150	Pound Sterling	

b) Olivia buys a souvenir in France that costs €280 (Euros). She wants to know how much she paid in Canadian Dollars. How much did the item cost in CAD?

Name: _____

a) Convert the CAD to other currencies

CAD	Other Currency	$
$2234	Japanese Yen	
$99.90	Euro	
$6840.98	Australian Dollar	
$2150	Pound Sterling	

b) Olivia buys a souvenir in France that costs €280 (Euros). She wants to know how much she paid in Canadian Dollars. How much did the item cost in CAD?

Name: _____

a) Convert the CAD to other currencies

CAD	Other Currency	$
$2234	Japanese Yen	
$99.90	Euro	
$6840.98	Australian Dollar	
$2150	Pound Sterling	

b) Olivia buys a souvenir in France that costs €280 (Euros). She wants to know how much she paid in Canadian Dollars. How much did the item cost in CAD?

Name: _____ 9

Exchange Rate – Souvenir Shop

Menu	$USD
T-shirt	$22.50
Sweater	$45.75
Hat	$15.00
Postc[illegible]	$2.75
Keyc[illegible]	$5.50

A souvenir shop in Buffalo, New York sells many items to Canadian tourists. They list their price in USD but will accept Canadian money at a rate of 1USD to 1.35CAD. They know the exchange rate is high, but they want to make sure they can exchange the CAD to USD at the bank and not lose money.

Ques[illegible] [illegible] will the Canadian customers pay in CAD?

1) Aurora buys [illegible] and [illegible] much does she owe in CAD?

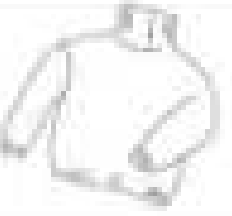
2) Luke buys a sweater and keychain[illegible] ch [illegible] owe in CAD?

3) Hudson has $35 CAD left after his trip to the US[illegible] to[illegible]-shirt, and postcard.
a) Can he afford it?

b) If yes, how much money will he have left?

4) Penelope wants to buy one of each item. How much will it cost her in CAD?

5) Wyatt has $23 in USD and $30 in CAD. Can he buy a sweater?



Name: _____ 10

Exchange Rate – Burger Shop

Jayden works at a burger shop in Niagara Falls, Ontario. He serves many customers from the United States, who cross the border to check out Canada's side of the falls.

He provides his customers with an exchange rate of 1CAD to 0.85USD. Some of his US customers don't agree with the rate, but he must make sure he doesn't lose money in the exchange.

Menu	$CAD
Burger	$5.50 each
Fries	$3.50 each
Drink	$2.50
Onion Rings	$3.75
Combo – Burger and Fries	$7.50

Ques questions below

1) A custome ger ion rings. How much will Jayden charge them in USD?

2) A customer orders 2 co w y owe in USD?

3) A customer orders onion rings, fries and a d he Jayden a $10 USD bill. How much change will Jayden give them in

4) Jayden has run out of USD. He uses a rate of 1USD eq 1. nge back in CAD. A customer pays $20USD to Jayden for 3 burgers ge does Jayden owe them in CAD?

5) Jayden earned $323USD today selling to tourist from the United States. He brings it to the bank and exchanges it to CAD with an exchange rate of 1CAD to 1.27USD.

a) How much CAD did he get?

b) How much extra money did he earn by using an exchange rate of 1CAD to 1.15USD in his store?

Name: _____ 11

Comparing Money – Different Currencies

Rank	Currency	$	CAD
1)	US Dollar (USD)	1USD	$1.25
2)	Euro (EUR)	1EUR	$1.45
3)	Japanese Yen (JPY)	1JPY	$0.011
4)	Pound Sterling (GBP)	1GBP	$1.70
5)	Australian Dollar (AUD)	1AUD	$0.92

The top 5 currencies in the world are displayed in the table. Their values are presented as a rate of 1 of their currency to CAD.

Example – If we convert 1JPY, we will get $0.01 or 1 cent. We will get $0.92CAD for 1AUD.

Part 1 Use the table to compare the currency amounts.

1)	$20.00C		¥	6)	$215.00CAD		$250.00AUD
2)	$75.00USD		[illegible]	7)	$382.10CAD		¥1200.00JPY
3)	$8.25CAD		$ AU	8)	0.00CAD		€725.00EUR
4)	£22.50GBP		$25.15C	9)	SD		$1100.00CAD
5)	$125.00CAD		€92.00EUR	10)	77		$1352.21CAD

Part 2 Answer the questions below

1) Peter is shopping for a new guitar from 5 different countries around the world. The same guitar is priced in 5 different currencies. Rank the prices from lowest to highest.

$605AUD, $442USD, £326GBP, ¥21300JPY, €378EUR

1)	2)	3)	4)	5)

2) Steven is deciding where he can vacation for the cheapest cost. He found out the price of an average dinner cost for 5 different countries. Rank the countries from cheapest to most expensive.

Japan – ¥2415JPY, Australia – $25.95AUD, England – £22.32GBP,
USA – $27.53USD, Belgium – €21.38EUR

1)	2)	3)	4)	5)

Name: _____ 12

Examples of Currency Exchanges

People are spending money in other countries more and more. With the use of the internet, we can access stores from countries around the world with a single click. When we buy goods or services in other countries, we use our Canadian money to buy things that are in other currencies.

Goods are things we can hold, while services are when people or businesses help us with something we need.

Goods Think of 3 goods you might buy from another country

	ds (example – surfboard from California)
1)	
2)	
3)	

Services Think of 3 services yo buy r country

	Services (example – A we esio land)
1)	
2)	
3)	

Scenarios Brainstorm 3 scenarios where you would require transferring money to another country

	Scenario (example – sending money to a friend in another country)
1)	
2)	
3)	

Name: _____ 13

Researching Currencies Around the World

Research online 10 different currencies and compare them to our Canadian currency. You can use the keywords on Google: "currencies around the world" to find a list of all the currencies used around the world.

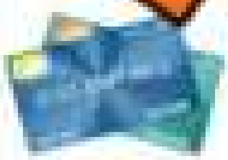
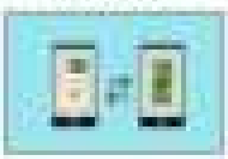
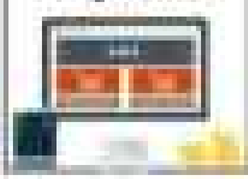
Tip: To find the value per 1CAD, type in, "CAD to (name of other currency)" on Google

Research Fill in the table below with your research

		Currency *Ex. Canadian Dollar*	Currency Code *Ex. CAD, USD*	Value Per 1CAD *("CAD to ...")*
1)				
2)				
3)				
4)				
5)				
6)				
7)				
8)				
9)				
10)				

Name: ______________________ 16

Transferring Money – Pros/Cons

Methods of Payment	Advantages (Pros)	Disadvantages (Cons)
Cash  	- Controls your spending because you can't spend money you don't have - No extra fees of using a card - You can get cash from other [illegible]rrencies before travelling so that [illegible] don't pay extra conversion fees	- You can lose cash - If cash is stolen, it's gone for good - Transactions take longer - Can't pay for online purchases - Conversions are done manually and the business gets to decide which rate they will give you (could be unfair)
Credi[illegible] 	[illegible] to buy things you don't ha[illegible] pay with now [illegible] ws you to [illegible] mo[illegible] future [illegible] se f[illegible] ments - Re[illegible] - You can [illegible] cred[illegible] all over the [illegible]	- Easy to overspend with money you don't have which can lead to debt - You pay interest (average rate is 18%) - Credit card monthly fees - If you miss payments, you can damage your credit score - You will be charged up to 3% of your purchase if you buy something using a [illegible]rent currency
Debit Card 	- You can only spend mo[illegible] you have which leads to [illegible] - Less or zero fees - Can use for online purchases - Quick payments using tap feature - Allows access to interest-earning bank accounts - Can buy things all over the world because your bank will convert your money to other currencies	[illegible] out of money and not be [illegible] you might need [illegible]rd points [illegible] credit score [illegible]t card - R[illegible] - You w[illegible] purchase i[illegible] you b[illegible] different curren[illegible]
Electronic Money Transfer 	- Can pay for things without using debit or credit card - Can send money to anyone with an email address or phone number - You can only send money you have which saves you from debt	- Can't access credit - Could send money to wrong address - There is a limit on how much you can send using an EMT - High fees for sending transfers - Cannot send an e-transfer from a Canadian bank to another country
Online Payments 	- Access your bank account to buy things online - Send money to other people and businesses in other countries - Can use different platforms like PayPal to access credit/debit cards	- Will pay conversion fees of around 3% to buy things in other currencies using online payment platforms - Many online stores charge an extra 2% to convert your currency to their sale currency

Name: _____ 17

Explain	Which 2 advantages/disadvantages do you think are most important?

1) Credit Cards	Most Important Advantages/Disadvantages
Advantages	
Disadvantages	

2) Debit Card	Most Important Advantages/Disadvantages
Advantages	
Disadvantages	

3) Cash	Most Important Advantages/Disadvantages
Advantages	
Disadvantages	

Payment in Other Currencies

Rank	Currency		CAD
1)	US Dollar (USD)	1USD	$1.25
2)	Euro (EUR)	1EUR	$1.45
3)	Japanese Yen (JPY)	1JPY	$0.011
4)	[illegible]rling (GBP)	1GBP	$1.70
5)	[illegible] (AUD)	1AUD	$0.92

Making payments in other currencies comes at a cost. For most payment methods, the average cost is 3%.

Example – If something costs €10 EUR, it will cost us 10 x 1.45 = $14.50 CAD plus an addition 3% of the purchase price in CAD (14.50 x 0.03). This means we need to add $0.44 to our total = $14.94 CAD

Calculate [illegible] cost in CAD with a 3% conversion fee

	Cost Purchase Price [illegible]	[illegible]	3% Conversion Fee of P.P.	Total Cost
1)	$20 USD	[illegible]	$0.75	$25.75
2)	$60 USD			
3)	¥2000 JPY			
4)	€85 EUR			
5)	£175 GBP			
6)	$252 AUD			
7)	$750 USD			
8)	€29.42 EUR			
9)	¥22512 JPY			
10)	£5630.35 GBP			

Name: _____ 21

Methods of Payment – Poster Assignment

Design a poster that a bank would use to promote the use of a method of payment.

Consider the following in your poster (Success Criteria):

- Highlight one important advantage of the payment method (include currency conversion)
- Use a slogan or one line to highlight this advantage
- Use a large title
- Use [illegible] text to keep the poster visually appealing
- Use [illegible] and pictures to help explain your message
- Fill [illegible] completely and do not waste space

Plan [illegible] quizer below to prepare for creating your poster

1) Which meth[illegible]ent w[illegible]se?

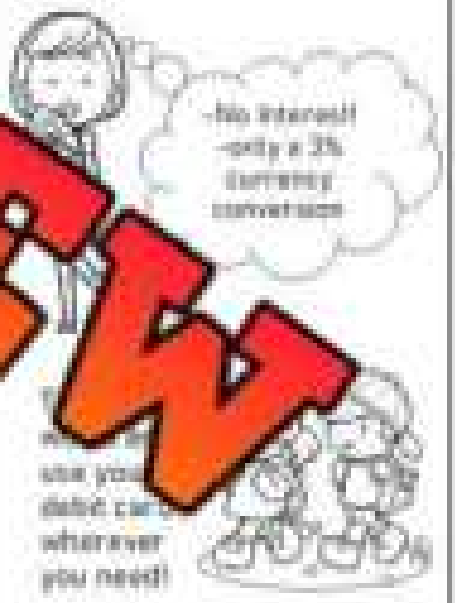
2) What will the title of your p[illegible]?

3) What text will you include on your poster? S[illegible]

4) What pictures will you draw? Practice them below.

Sample Poster

Choose Debit



Name: _____ 22

Methods of Payment

Name: _____ 23

Social Media Post: Help Making a Financial Plan

@MoneyGoals101:

Yo, how do you actually make a solid money plan so you can hit a big goal, like buying a car or starting a small biz, without going broke?

7:15 AM · 22/02/2025 · 3,403 SHARES 7,126 LIKES

@CashQueen88: Step one—figure out all your income sources. Hourly wage, salary, tips, commissions, profits from a side hustle, even interest from your savings account. More streams = faster to your goal.

@[illegible]: Don't get fooled by your gross income. Taxes, CPP, EI, and taxable benefits mean that you keep is smaller. Always plan based on the take-home pay.

@[illegible]: [illegible] investments, track both gains AND losses. Making $500 in stocks is [illegible] $[illegible] somewhere else changes your actual earnings.

@CashQueen88: [illegible] utilities, phone, food, Netflix, gas, even random stuff. Once you know [illegible], you can cut what's not helping.

@BudgetBro: Watch the [illegible] concerts, and travel are cool, but they can slow down your savings [illegible] for a free event sometimes.

@FinanceNerd: Health + dental cov[illegible] matters. [illegible] but not having it can lead to huge medical bills later, which can destroy your [illegible] g[illegible].

@CashQueen88: Running a business? Think s[illegible] re[illegible] more orders, buy in bulk to save money, or raise prices just enough [illegible] customers.

@BudgetBro: Bulk buying is a huge win for saving costs. [illegible] f[illegible] os per unit means more profit, as long as you don't overstock stuff [illegible] wo[illegible].

@FinanceNerd: Automate your savings so a set amount goes straig[illegible] ir[illegible] savings account or investment. That's passive income while you sleep.

@CashQueen88: Short-term goals (like $500 in 2 months) keep you pumped, but don't forget the long-term ones (like $5k in 2 years) so you don't blow all your savings halfway.

@BudgetBro: If your income changes—like seasonal work or commission jobs—plan for those low months by saving extra during the high-income months.

@FinanceNerd: Always compare your budget to your actual spending each month. If you keep going over in one category, adjust it or cut something else.

@CashQueen88: Don't be scared to invest in yourself—courses, equipment, or tools that help you make more money in the future are worth the expense now.

@BudgetBro: End game: spend less than you make, save smart, invest wisely, and expect surprise costs. That's how you actually hit your financial goals.

Name: _____ 24

Questions Answer the questions below using evidence from the text.

1) Why is it important to consider both income and expenses when setting financial goals?

2) What are some examples of expenses that could reduce profits from a business or job?

3) How [illegible] affect both income potential and expenses over time?

True or False Is the statem[illegible] or F

1) Step one is to figure out all your income sou[illegible]	T	F
2) Your gross income is more important than net incom[illegible]	T	F
3) To reach a financial goal, you should understand your inc[illegible]d	T	F
4) Passive income is income you need to work hard to make.	T	F
5) Investing in yourself can help increase your income in the future.	T	F

Opinion Write a comment that you would add to this conversation

Username: _____ Date: _____

Name: _____ 27

Gross vs Net Income

What is Gross Income?

Gross income is all the money you earn. For most people, their income comes from their work, but there could be other sources of income, such as lottery winnings, interest earnings, and the selling of assets and investments.

What is Net Income?

Net income is how much income is left after paying for non-negotiable expenses. For adults, taxes and retirement contributions are the most common costs.

Income Ta

Everyone [illegible] income tax. **Income tax** is a percentage of income that is paid to the g[illegible] come you earn, the more income tax you will pay.

An Ex

For example, [illegible] ns $54,000 in gross income yearly. Earning this much means you will [illegible] in i[illegible] This means the average Canadian takes home $41,887 in net inc[illegible] income of $100,000 will pay $27,084 in tax for a net income of $72,916.

Questions	Answer [illegible]alue

1)	Alex earned $38,413 from his emplo[illegible] He also [illegible] the lottery. He paid $9340 in taxes. What is his net inco[illegible]	
2)	Robert earned $79,575 from his job. He sold a [illegible] and an additional $95,358. He paid $53,538 in taxes. W[illegible] inc[illegible]	
3)	Suzanne earned $145,094 from her salary and from sel[illegible] inv[illegible] She decided to contribute $45,095 towards her retirement to pu[illegible] income under 100,000. She paid $27,084. What is her net income?	
4)	Claire has her own business that earned $278,500 last year. She paid $[illegible] in business expenses and paid the rest of the money to herself. In the end, she paid $51,320 in taxes. What is her net income?	
5)	Zack earned $134,048 from his job and from selling 500 shares of a stock he owned. He contributed $25,000 to his retirement. His net income is $81,304. How much income tax did he pay?	
6)	Willow earned $51,530 from her job, $34,520 from her side business and she sold stocks she owned for $41,430. She paid $42,405 in taxes. How much gross income did she earn?	
7)	John is a professional athlete who earned $6,450,000 last year. He also earned $650,000 for endorsements he did. His paid $3,712,084 in taxes last year. How much net income did he earn?	

Name: _____ 28

Income Tax – Gross/Net Income

Income Tax
You will pay more income tax when you earn more gross income. The table shows how much income tax on average is paid for each income tax bracket.

Although this is not exactly how accountants determine how much income tax you pay, it gives a good idea of how income tax works. In actuality, if you earn $70,0[illegible] will pay 7.5% on $20,000, 15% on $20,000, [illegible], and 24% on $10,000.

To ge[illegible] use the average tax rates [illegible], if you earned $83,540, you would pay [illegible] in income tax. This would [illegible] net income of $61,819.60.

Gross Income Bracket	Avg. Tax Rate
$0 - $20,000	7.5%
$20,000 - $40,000	15%
$40,000 - $60,000	21%
$60,000 - $80,000	24%
$80,000 - $100,000	26%
$100,000 - $150,000	28%
$150,000 - $250,000	31%
$250,000 - $500,000	39%
$500,000+	50%

Questions Deter[illegible] tax would be paid and the net income

	Gross Income		Net Income
1)	$95,542	[illegible]	$70,701.08
2)	$42,826		
3)	$91,542		
4)	$105,635		
5)	$474,268		
6)	$3,547,852		

Word Problem Answer the question below

Peter owns a company that made high earnings last year. He ended up earning $273,049 but doesn't want to pay too much tax. He is debating contributing some money to his retirement so that he can bump down to the next lowest tax bracket.

a) How much will he need to contribute to his retirement to bump down?	
b) How much tax would he pay if he does contribute?	
c) How much will he pay if he doesn't?	
d) How much will he save on his taxes?	

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Mark

a) Determine how much income tax would be paid and the net income

	Gross Income	Income Tax	Net Income
1)	$82,500		
2)			
3)			

b) Maria made $1 ... She saved up $10,000 for retirement and wants to use it to reduce her ta...

i. If she appli... which bracket would she fall into?

ii. How much tax will s... lower bracket?

iii. What will be her new net income?

Name: _____

Mark

a) Determine how much income tax would be paid and ...

	Gross Income	Income Tax	
1)	$82,500		
2)	$610,000		
3)	$2,240,800		

b) Maria made $107,200 this year. She saved up $10,000 for retirement and wants to use it to reduce her tax payment.

i. If she applies the $10,000 contribution, which bracket would she fall into?

ii. How much tax will she save by moving into a lower bracket?

iii. What will be her new net income?

Name: ______________________ 31

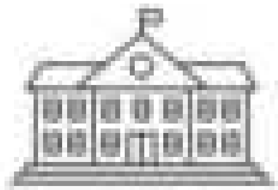
Evaluating Financial Plans

Questions Read the profiles below and calculate if they met their financial goals

1) Emily is trying to save $12,000 for college next year. She has 12 months to achieve her goal. Here are the details of her year long journey to achieve her financial goal.

- She earns $1800 gross income a month from her employer
- She pays $300 in taxes per month
- She is ... budget, spending $75 a week
- She n... pay $1800 for a dental procedure

Did she ... ncial goal of $12,000?



2) Jaxon want... dr... for $2500. He hopes to buy the drum set in the next 20 weeks. He ha... a fin... below.

- He will find a jo... hour. He will work 10 hours a week.
- He will go out for lu... week ... each lunch
- He is planning to buy hi... d... esents worth $125 each.

a) Will he reach his financial goal of $25...

b) If Jaxon decided to work 12 hours a week, w... rea... ow much would he save?

3) Anthony wants to retire in 30 years. He is 25 right now. He ... in savings when he retires. His financial plan is listed below.

- He earns $92,430 a year in gross income from his job
- He earns $500 a month in dividends from his investments
- He earns $300 in rental income from his rental property each month
- He pays $27,302 in income tax each year
- He is on a budget, spending $3,000 a month on expenses (house, car, phone, etc.)

a) Will he save $2,000,000 by the time he is 55?

b) Oh no, at the age of 45, Anthony's expenses increased to 4,000 a month because he now spends $1,000 on a medical issue. Will he still reach his financial goal at the age of 55?

Name: _____ 33

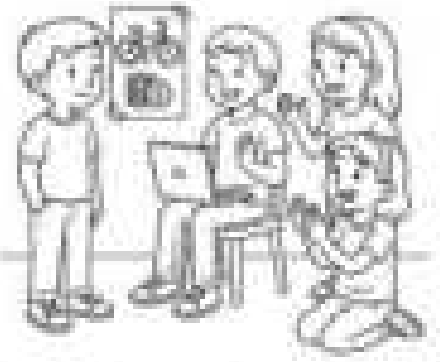
Role Play: Financial Planning Role Play

Objective What are we learning about?

Practise financial decision-making, budgeting, and communication skills by acting out real-life financial situations that include income, expenses, and tax considerations to reach a long-term financial goal.

Materials What you will need for the activity

- Scenario cards for role play
- Simple pr



Instructions How to complete the activity

1. Divide the class into small groups and give each group a financial scenario card that includes a financial goal, income, expenses, and possible tax implications or deductions.
2. Have each group read their scenario and discuss the following questions: What is the financial goal? What are the sources of income? What are the expenses? How do taxes or deductions affect the plan? What steps can be made to reach the goal?
3. Give each group time to create a simple financial plan showing how they will reach their goal while balancing income, expenses, and taxes.
4. Allow groups time to rehearse their role play and encourage them to include problem-solving strategies such as cutting expenses, finding extra income, or adjusting timelines.
5. Have each group perform their role play for the class, demonstrating how they make decisions to reach their financial goal.
6. After all performances, hold a class discussion where each group explains how they balanced income, expenses, and taxes, the changes they made to their plan, the challenges they faced, and how their decisions affected their ability to reach their financial goal.

Name: _____ 34

Scenario Cards | Cut out the scenario below.

Role-Playing Scenarios
Starting a YouTube Channel – You want to grow a gaming channel to 10 000 subscribers in one year. Your income comes from ad revenue and sponsorships, but you also have expenses like equipment, editing software, and internet upgrades. You must plan how to invest in your channel without overspending.
Saving for a Sports Tournament Trip – Your basketball team has qualified for a national [illegible]ment in another province. You need to save $1 800 for travel, hotels, [illegible] You earn money from part-time refereeing, but also spend on spor[illegible] and streaming subscriptions. Plan how to save enough in six [illegible]
Buying a New [illegible] – Your [illegible]ent phone is slow, and you want the latest model for $1 400. Y[illegible] money [illegible]bysitting and dog walking. Expenses include school lunches, [illegible] subscriptions. You must budget carefully while considering sa[illegible] buy now or wait for a sale.
Starting a Sneaker Resale [illegible] – [illegible] to buy limited-edition sneakers to resell for profit. You have $[illegible] to [illegible] weekly allowance, but you also spend money on clothing, gam[illegible] con[illegible] need to plan purchases to maximise profit while managing expenses [illegible].
Planning a Concert Trip – Your favourite ba[illegible] perf[illegible] nearby city. Tickets, travel, and merch will cost $450. You [illegible] lawns and online tutoring, but also have expenses like Nethi[illegible]. [illegible] buy gifts for friends. Plan how to afford the trip in three months.
Launching a Small Clothing Brand – You and a friend want to [illegible] hoodies. You'll need to pay for materials, printing, and marketing. Y[illegible] income from part-time work at a café, but also spend money on tra[illegible]portation, gaming, and takeout. Plan to make a profit in four months.
Upgrading Gaming Setup – You want a new monitor, chair, and headset costing $800 total. You earn from streaming tips and weekend work at a snack bar. You also have expenses like a phone plan, school trips, and snacks. Plan to reach your goal in five months without using credit.
Planning a Summer Business – You want to start a summer lawn care and dog walking business. You'll need to buy equipment and promote your services. You earn income from odd jobs but also spend money on clothes, outings with friends, and your gym membership. Create a plan to save for startup costs and still make a profit.

Name: _____ 35

Tips For Reaching Goal | General Tips for Making and Managing Money

Tip	Explanation
Increase Your Earnings Over Time	Take on more customers, add extra hours, or offer new products/services to grow income steadily.
Set the R[illegible]e	Charge enough to cover costs and make a profit, but not so high that customers choose competitors.
Balance Qu[illegible]	Work efficiently to take on more jobs, but keep quality high so customers return.
Use Bulk Buying for Sa[illegible]	Buy in bulk to reduce costs, but only if you can use them before they go to waste.
Offer Extras or Upgrades	Add [illegible] customers will pay more for, increasing [illegible] without much added expense.
Save a Portion of Every Payment	Put aside a fixed [illegible] of all income so savings [illegible] your goal.
Avoid Spending All New Income	Increase earnings without increasing [illegible] at the same rate to reach your goal faster.
Plan for Busy and Slow Periods	Save more during busy seasons to cover expenses during slower times.
Reinvest Wisely	Spend part of profits on better tools, ads, or training to help earn more in the future.
Track Your Progress	Record money earned, spent, and how close you are to meeting your financial goal.

Name _____ 36

Two Stars And A Wish	Identify two strengths (stars) and one area for improvement (wish) about your classmate's performance.

Write two strengths and one weakness of your classmate's performance.

Name: _____ 37

Interview with Financial Planner – Balancing Budgets

Kid: Hi! I'm here a Financial Planner. Can you explain what "balancing a budget" means?

Financial Planner: Sure! Balancing a budget means making sure your income (the money you earn or receive) is equal to or greater than your expenses (the money you spend). In Canada, about 1 in 3 households spends more than they earn, which can cause financial stress.

Kid: So what exactly counts as income?

Financial Planner: Income can be wages, salaries, commission, tips, investment returns, profits from a busi[illegible], or even interest earned from savings. For students, income might come from part-time [illegible] babysitting, or online selling.

Kid: What[illegible]?

Financial Planner: [illegible]es are regular payments that stay the same each month—like rent, insur[illegible] subscrip[illegible] payments. They're predictable, which makes them easier to plan for. Experts may [illegible]ld ideally be no more than 50% of your monthly income.

Kid: And variab[illegible]?

Financial Planner: V[illegible] month to month. These include groceries, clothing, entertainment, [illegible]. Because they're flexible, they're usually the first place to cut back if you need [illegible] money.

Kid: How much should I save?

Financial Planner: A common rule is the "[illegible] rule": 50% for needs, 30% for wants, and 20% for savings. For savings, aim for at least 10[illegible] of your [illegible] can go into an emergency fund, short-term goals, or long-term in[illegible] like [illegible]egistered Retirement Savings Plans) or TFSAs (Tax-Free Savings Accou[illegible].

Kid: What's an emergency fund?

Financial Planner: It's money set aside for unexpected events—[illegible], medical expenses, or car repairs. Financial advisors suggest having [illegible] 3–6 months' worth of living expenses in your emergency fund.

Kid: How do you track all of this?

Financial Planner: You can use spreadsheets, apps, or even paper. Budgeting apps like Mint, YNAB, or PocketGuard automatically categorize your spending. Spreadsheets give you more control to customize categories and watch trends over time.

Kid: What happens if my budget isn't working?

Financial Planner: That's normal! Budgets aren't set in stone. If you overspend in one category, adjust your next month's plan. For example, if you spent $50 extra on clothes, you might cut $50 from entertainment. It's about finding balance.

Kid: What's your best advice for teens starting to budget?

Financial Planner: Start small. Track your spending for one month to see where your money goes. Then, set a simple budget—decide how much to spend, save, and adjust as needed. And remember, a budget is a tool to help you reach your goals, not a punishment.

Name: _____ 38

True or False

Is the statement true or false?

1. Fixed expenses are costs that stay the same each month.	True	False
2. Variable expenses change based on how much you use or buy.	True	False
3. A budget only tracks how much money you spend.	True	False
4. Budgeting tools can include apps, spreadsheets, and notebooks.	True	False
5. Adjusting your budget is not necessary if your income changes.	True	False

Questions

wer the questions below.

1) Ho sing s ols like spreadsheets or apps help manage money?

2) How could you start budgetin hat aks?

Fill in the Blanks

Use the word bank to fill in the bl ks.

spending	Spreadsheets	expenses	planning	savin adjusted

1. Budgets should be _____ when income or expenses change.
2. Fixed _____ are costs that remain the same each month.
3. Tracking _____ helps identify areas to save money.
4. Budgeting includes tracking both spending and _____.
5. _____ are a useful tool for balancing budgets.
6. Financial management skills improve with practice and _____.

Name: _____ 39

Balanced Budget

A **budget** is a plan that lists the money you earn and the money you spend over a particular length of time. Budgets help people plan how their money is used so they can avoid wasting money on things they don't need.

Part 1 Calculate your earnings

If your job paid you $20 per hour, how many hours would you want to work?
Fill in the table below.

	Hours	Income (Earnings) ($)
Hours per day		
Hours per week		
Hours per month (30 days)		

Part 2 Brainstorm the amount of money you would want to spend on each per month

Categories	Expected Money To Be Spent On Each Category Per Month
Food	
Rent/Mortgage	
Entertainment	
Cars	
Clothing	
Phone/TV/Internet	
Other:	
Total	

Part 3 Calculate your earnings, expenses, and savings for the periods of time below

Categories	Income	Expenses	Savings
1 Year			
5 Years			
10 Years			

Name: _____ /0

Curriculum Connection
XX.X

Kai's Budget

Kai is a high school student who wants to save money for university. As part of his financial plan, he has created a budget to outline his income and expenses.

Part 1 — Calculate Kai's total net income for one month

Income Source – Figures after taxes	Net Income Per Month
[illegible]$/hour – 40 hours a month	
[illegible] week (4 weeks a month)	
[illegible] – 4 times a month	
Total Net Income	

Part 2 — Calcul[illegible] for one month

Categ[illegible]	Expenses Per Month
Food – $8 a meal – 12 meals a[illegible]	
Clothing – 3 items a month – $25[illegible] item	
Entertainment – $5 a day for 30 days	
Gas for car – 60L a month – $1.35/L	
Total Expenses	

Part 3 — Answer the questions below

1) Is Kai's budget balanced? Explain why or why not.

2) If Kai continues this budget for 4 years of high school, how much will he have saved for university?

Name: _____ 41

Adult Budget

Brian has filled out most of his budget but needs help finishing it. Help him determine if he has a balanced budget.

Part 1 Fill in the budgets – income and expenses

Income			
Pay Period		Income Taxes Owed (24%)	Net Income
2 Weeks			
4 Weeks			
6 Weeks			
26 Weeks			
1 Year			
Total 1-Year Gross Income			
Total 1-Year Net Income			

Expenses	
Rent/Mortgage	12000
Utilities	4000
Food	8000
Cars – Transportation	3000
Entertainment and Recreation	4500
Personal Care – Lifestyle	4200
Phone/TV/Internet	2800
[illegible]cellaneous	3000
[illegible] Fund	5000
[illegible]penses	
[illegible]	

Part 2 Answer the questions below

1) Is Brian's budget balanced? Explain why or why not.

2) What is one thing that surprised you about Brian's budget?

3) Brian received a $1,000 a month raise. Where should he put the extra money in his budget? Explain your choice.

Name: _____ 42

Typical Wages and Salaries in Your Community

Perform some research to learn more about the wages and salaries for different jobs/careers in your community. Wages are hourly rates, whereas salaries are how much income people earn per year.

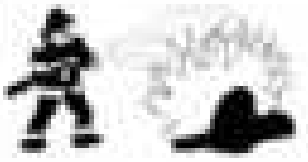
Research Fill in the table by researching different jobs in your community

Job/Career	Wages/Salary	Your Thoughts on the Income
Firefighter	$85,085	"Firefighting is a tough job, so they earn their salary. Maybe I should consider firefighting as they make a good income"

Name: _____ 43

Create Budget Using Your Research – (1)

Use one of the jobs/careers you researched to fill in the budget below



Part 1 Fill in the budgets – income and expenses

Income			
Pay Period		Income Tax Owed (if unsure use tax 25%)	Net Income
2 Weeks			
4 Weeks			
6 Weeks			
26 Weeks			
1 Year			
Total 1-Year Gross Income			
Total 1-Year Net Income			

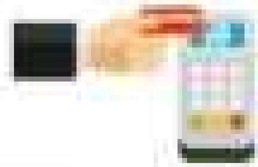
Expenses	
Savings (Income –	

Part 2 Answer the questions below

1) Is your budget balanced? Explain why or why not?

2) Which decisions were hard about balancing your budget? Which expenses did you have to spend less on than you wanted to?

Introduction to Interest



What is Interest?
Interest is the amount of money earned from an investment or the cost of borrowing based on an interest rate.

Interest From Investments
We can earn interest on our investments, which means we are putting our money to work! If we invest $100 in the stock market, we hope that one hundred dollars is worth more at the end of the year. The average interest rate return in the stock market over the last 100 years is ab[illegible]0%. This means that after one year, your $100 is now worth $110.

Interest Fr[illegible]wing
Most peo[illegible]ed to borrow money to pay for things like cars, houses, or even wate[illegible]ehold necessities. When we borrow money, we pay the lender (usua[illegible] amount we pay in interest depends on the interest rate. A higher interest [illegible] will [illegible] back in interest. For example, if we borrow $100 with a 15% yearly in[illegible] w[illegible]115 at the end of the year. It is important to shop around for the lo[illegible]est [illegible]

Part 1 A bank pay[illegible] intere[illegible] your savings account – $5 per $100

Savings	Savings + Interest
1) $200	$205.00
2) $425	
3) $650	
4) $875	

Savings	Savings + Interest
5) [illegible]	
[illegible]	
[illegible]	
8) $[illegible]	

Part 2 You pay 19% interest on your credit card – for every $[illegible] y[illegible] $119

Debt	Debt + Interest
1) $500	$595
2) $655	
3) $827	

Debt	Debt + Interest
4) $979	
4) $1762	
7) $2475	

Debt	Debt + Interest
8) $4623	
9) $6817	
10) $8659	

Part 3 Answer the question below

What are your thoughts on interest? Is paying a 19% interest rate fair?

____

____

____

Name: ____________________

Memory Game: Interest Version

Objective | What are we learning about?

To help students understand and remember key interest-related terms and examples by playing a matching card game.

Materials | What you will need for the activity

- M... (provided)
- ... and definitions related to int...
- A flat surf... or to lay out the cards.

Instructions | How yo... ...ity

1. Divide the class into groups of 3 o... each ... of Memory Game cards (provided).
2. Optional: have students match the terms w... ...r d... ...playing the memory game (with the cards facing up). This ... ...e terms and definitions. Take these up as a class to ensure eve... ...be ...matches.
3. Have each group lay all the cards face down in a grid on a tabl...
4. The students take turns flipping over two cards at a time, trying to fi... ...atching term and its definition.
5. If a student finds a match, they remove those cards from the grid and keep them.
6. If the cards do not match, they are turned back over, and the next student takes a turn.
7. The game continues until all the cards have been matched.
8. After the game, review the terms and definitions with the class.
9. Discuss why these terms are important to understand interests.

Name: _____ 47

Cards | List of terms related to interest.

Terms	Definition
Interest	Extra money earned from saving or investing your money.
Simple Interest	Interest earned only on the starting amount of money.
Principal	The original amount of money you invest.
Interest Rate	The percentage used to figure out how much interest you earn.
Savings Account	A place at the bank where you keep money and earn interest.

Name: _____ 48

Cards | List of terms related to interest.

Terms	Definition
Earned Interest	The amount of money you make from your savings or investment.
Saving	Putting your money into something (like a bank or stock) to make more money.
Percent (%)	A [illegible] to [illegible] interest rate – [illegible] every 100.
5% Interest	If you save $100, you earn $5 in a year at this rate.
$200 at 5% = $210	A savings example showing $10 earned in interest after one year.

Name: _____ 49

Cards | List of terms related to interest.

Terms	Definition
Compound Interest	Interest earned on the money you saved *and* the interest you already earned.
Annual Interest	Interest calculated once a year.
Savings Growth	[illegible] increase in your [illegible] earning interest.
Bank	A place that keeps [illegible] money safe and pays you interest for saving.
Future Value	The amount your money will be worth after earning interest over time.

Name: _____ 50

Reflection Answer the questions below.

1) Which interest term or concept that you learned about today was most interesting to you?

2) H… …g interest help you make better decisions about saving mon…

3) What's the difference between a savings … an… …t earned on it?

4) Why is the interest rate important when choosing where to save money?

Name: _____ 51

Interest Rates

What are Interest Rates?
An **interest rate** is the percentage of money a lender (usually a bank) will charge you for you to borrow their money. You will need to pay the principal (the amount you borrowed), plus interest, which is an extra amount that makes it worth it for the lender to let you borrow money from them in the first place. If there was no interest, there would be no reason for the lender to let you borrow their money.

Examples of Interest Rates
Pretend your friend needs $50 to buy a video game. You could be a nice friend and lend it to them for free, or you could charge them interest. The amount of interest you charge them will be the interest rate.

You also have to agree to terms on the repayment of the loan. Most lenders charge an annual interest rate, which means you pay the percentage of the loan yearly. In this example, you could tell your friend they will owe you 10% more each year if they don't pay back the loan. This would mean you charge them an extra $5 for borrowing the $50 and they will owe you $55 in one year from the loan.

Factors Affecting Interest Rates
Not all banks and lenders give the same interest rate for borrowing money. That is why it is important to shop around for the best interest rate. The following factors impact how much an interest rate is.

- People with good credit will tend to get lower interest rates. Having good credit means that you have a history of paying back your loans on time. A lender would likely charge a friend a higher interest rate if you were worried they wouldn't pay you back on time.
- The type of loan impacts the interest rate. A mortgage is a loan for the purposes of buying a house. The lender does a lot of research to make sure the borrower can afford to pay back the loan. This makes the loan more secure for the lender. A typical mortgage interest rate is between 2% and 5%.
- Credit card loans are riskier because it is easier to sign up for a credit card than to qualify for a mortgage. Credit card loans are often not paid back on time, which means the lender is out the money they lent out. This means they need to charge a higher interest rate, usually between 15%–25%.
- Where you get the loan will also affect the interest rate. If you go to a bank, you will likely get a fair interest rate. Banks are regulated by the Canadian government, which means they abide by rules setup to protect people who borrow money. You can also get loans in the form of a "Payday Loan", which are usually short-term loans that are paid back when someone gets paid from their employer. These loans can be dangerous, as they are much more expensive than credit cards and other loans offered from the bank. For example, a payday loan of $300 for 2 weeks will cost you $45 extra. The same loan using a credit card would cost you $6.15.

Name: _____ 52

True or False

Circle whether the statement is true or false

1) All interest rates are the same regardless of who you are borrowing from	True	False
2) Riskier loans have lower interest rates	True	False
3) People with good credit usually get better interest rates	True	False
4) Credit [illegible] have lower interest rates, between 2% and 5%	True	False
5) Payd[illegible] pensive, with high interest rates	True	False

Making Connections

[illegible] the reading remind you of in your life?

Questions

Answer the questions using evidence [illegible]

1. Why is it important to shop around for the best interest rate?

2. Why do people and banks charge an interest rate?

Name: _____ 53

Calculating Simple Interest

When we borrow money, we usually pay interest on the total amount we borrow. We call this amount the **principal**. Depending on the type of loan, the interest rates will vary. **Simple interest** is interest paid on the principal amount. We can calculate simple interest by using the following formula:

Simple interest = principal x interest rate x time to pay back the loan

This will give us how much interest we will pay for our loan.

For example, if you owe $5000 for a car loan with a 5% simple interest rate on a 5-year term. The amount of interest you will pay after the 5 years is 5000 x 0.05 x 5 = $1250

Part 1 Fill in the table to determine the cost of borrowing for 3 and 8 years

#	Principal	Interest	3-Year Loan	8-Year Loan
1)	$2000		$300	$800
2)	$3500			
3)	$6000	19%		
4)	$10,000	8%		
5)	$17,000	10%		
6)	$25,000	4%		
7)	$47,500	3.5%		

Part 2 Answer the questions below

1) Is it more or less costly to borrow money for longer periods of time. Explain why that might be the case.

2) Jake is borrowing $8000 for a new car. The interest rate is 6%. He's not sure if he'll choose the 5- or 7-year term. How much will he save in interest on the 5-year term?

Name: _____ 54

Calculating Simple Interest

Questions | Answer the questions below

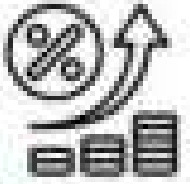
1) If you borrow $750 for 5 years with an annual interest rate of 8%, how much interest will you pay?

b) How much in total will you pay?

2) How much will you have to pay if you borrow $525 for 2 years at a 12% annual interest rate?

3) If you borrow $2175 for 6 years with an annual interest rate of 6%, how much interest will you pay?

b) How much will you pay in total?



4) If you get a mortgage loan for $225 000 to buy a house with an annual interest rate of 2.56%, how much interest will you pay for a 25-year loan?

b) How much will the house end up costing you?

5) Ivy paid $72 of interest when she borrowed $800. Her father said she paid 9% interest, but she says she had to pay 12%. Who is correct?

Name: _____ 56

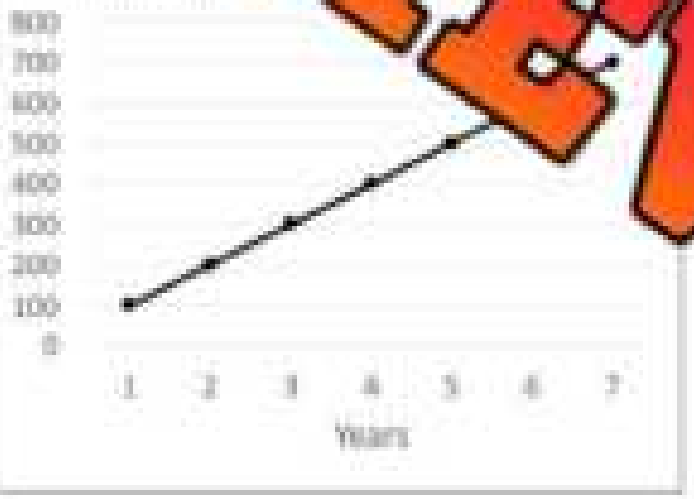
Simple Interest vs Compound Interest

Overview - Simple Interest vs Compound Interest

Simple interest is based on the principal amount of the loan or deposit. This means the interest paid does not change. For example, if you borrow $100 at a 5% annual interest rate, you will owe $5 in interest each year until the loan is paid.

Compound interest is based on the principal amount and the interest that accumulates on it every period. For example, if you borrow $100 at a 5% annual interest rate, you will owe $5 after the first year, and $105 the next year ($5.25). The third year, you would owe $110.25, which is $5.51.

Question: ... graph display a simple or compound interest loan?



1) How do you know which type of loan this was? Explain

2) ... be paid after 7 years?

3) Will ... a massive amount of ...

1) How do you know which type of interest is being applied? Explain

2) What do you notice about the graph? Why isn't it linear?

Name: _____ 57

Compound Interest - Investing

When we invest money, we hope it will grow over time. The longer we leave an investment, the more interest the initial investment will earn, which leads to it being worth more. For example, if an initial investment of $1000 grows 15% in a year, it will earn $150 and be worth $1150. If the investment keeps growing at 15% a year, the following year it will earn $172.50 and will be worth $1322.50.

Over the course of many years, an initial investment can grow to become a large amount! This is called compound interest, which Albert Einstein coined the ... wonder of the world!

Questi... ...ulate how much the initial investment grows after 5 years.

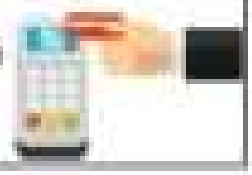
#	Initial Investment	1-Year 10% Total	2-Year 10% Total	3-Year 10% Total	4-Year 10% Total	5-Year 10% Total
1	$200			$266.20	$292.82	$322.102
2	$750					
3	$1000					
4	$1,500					
5	$2,100					
6	$3,500					
7	$72,000					
8	$115,000					
9	$150,000					
10	$500,000					

Name: ______________________ 58

Compound Interest - Borrowing

When we borrow money, we pay interest on how much we borrow. We need to consider how long it will take to pay back the debt before we decide to borrow. Borrowing money to buy things like a house or car are essential for most people even though those debts will take a long time to pay off. Luckily, mortgage interest rates are between 2-4% and car loans are typically around 5%.

On the other hand, borrowing to buy things we don't need can lead to us using credit cards to borrow. Credit cards have a 19% interest rate. Complete the table t[illegible] how credit card debt can become overwhelming with compound[illegible]



Ques[illegible] much interest is paid after borrowing for up to 5 years

#	Pri[illegible] Borrowing [illegible]	1-Y[illegible] 19% [illegible]	2-Year [illegible]% - Total	3-Year 19% - Total	4-Year 19% - Total	5-Year 19% - Total
1	$100	[illegible]	[illegible]	$168.52	$200.53	$238.64
2	$250					
3	$700					
4	$1250					
5	$2000					
6	$2500					
7	$2800					
8	$3250					
9	$5000					
10	$15,000					

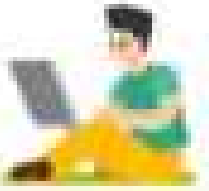
Name: _____ 59

Compound Interest – Online Tool

Calculating compound interest is a complicated process. Fortunately, we can use online compound interest calculators to help us with the math. Using these tools helps us understand the importance of compounding interest, as it can get us in a lot of debt or earn us a lot of money.

Directions:

1) Search online: compound interest calculator
2) Type in the values from the table below to determine how much your investment or debt will grow
3) Use [illegible] interest is compounded monthly for all your results



Part 1 — [illegible] table below

#	Principal (Initial investment or borrowing amount)	Additional	Interest Rate	Years to Grow	Total Value of Debt or Investment
1	$100	[illegible]		45	
2	$500	$50		40	
3	$2000	$200			
4	$25	$25			
5	$5000	$100	9%	30	
6	$8000	$250	8%		

Part 2 — Answer the questions below

1.	What amount could you contribute now and each month? How much would you have in 40 years if you started today assuming a 10% return?	
2.	Alex and Jeff are both 14 years old. Alex plans to contribute $10 today and $25 every month for the next 40 years. Jeff has more money now, so he will contribute $2000 today, but only $20 each month for the next 40 years. Assuming a 10% interest rate, who will earn more?	
3.	Sam has two options for a compound interest loan. Option A is borrowing $500 for 5 years with a 7% interest rate and option B is borrowing $500 for 4 years with an 8% interest rate. Which will cost him more money?	

Name: _____ 60

Compound Interest – Online Tool

Use an online compound interest tool to learn more about how you can reach different financial goals.

For example, to earn $250,000 in 25 years, you could invest $0 initially and add $200 each month. At the end of the 25 years, you'll have $267,578 with a 10% interest rate.

Part 1 Fill in the table with the minimum amount of contributions needed to reach the goal. Do not use an interest rate above 10%.

#	Goal	Time (years)	Principal (initial investment or borrowing amount)	Regular Monthly Additions	Interest Rate	Investment Exact Value
1	$2000			25	10%	$2,117
2	$5000					
3	$25,000	7				
4	$50,000	10				
5	$100,000					
6	$200,000					
7	$500,000					
8	$750,000					
9	$1,000,000					
10	$10,000,000					

Part 2 Answer the questions below

1) What did you learn about compound interest? Can small regular investments make a big difference in your savings?

2) If you invested the cost of a drink each day ($2.50/day) for 30 years with an interest rate of 10%, how much would you have in 30 years?

Name: _____ 61

Customer Loyalty and Incentive Programs

Incentive Programs

Businesses will do anything to sell more of their products and services. One popular marketing strategy is to offer incentive programs. An **incentive program** is designed to give rewards to customers to encourage them to buy or use their products or services.

Examples of incentive programs are:

- Free shipping
- Special[illegible] – "Dollar Days" or "No Tax Days"
- BOGO [illegible]y one, get one free
- Gi[illegible]thing and receive a ticket to enter a giveaway

Customer Loyalty

Customer loyal[illegible] are[illegible] businesses to get repeat business from customers. They are a form [illegible]e pr[illegible] **customer loyalty** program rewards customers with freebies or discount[illegible] customers. For example, Best Coffee Café gives 1 free coffee for e[illegible]es p[illegible]

It is very important for b[illegible]o business. Studies have shown that acquiring a new customer costs [illegible]ver[illegible]d 5-25x more than re-selling to a current customer. Also, it was found t[illegible]g c[illegible] spent 67% more than new customers. This is likely because existing [illegible]omers [illegible]ness because they already have an experience with it.

Both the customer and the business benefit [illegible]ng [illegible]y programs. The business benefits by having a customer base who [illegible] and over. They may earn less per sale if they give discounts, but [illegible] fro[illegible]arger volume of sales. The customer benefits by getting things they want [illegible] gets them more value for their money.

Examples of customer loyalty programs are:

- Reward Programs – At Starbucks, customers earn stars when they spend money. They can use these stars to get free items

- Points Programs – Many grocery stores, gas stations, and credit cards offer points programs. When you spend a dollar in many of these establishments, you get 1 point. You can redeem these points for free items from a catalogue, or for money to be used at their business.

- Tiered Loyalty Programs – Sephora's Beauty Insider program offers a tiered loyalty program. The more money you spend, the better the rewards you receive as you move up the tiers. At Sephora, members who spend $350 enter the VIB tier where they get free gifts and one free makeover per year. If they spend $1000 a year, they enter Rouge status with a private hotline and access to exclusive events.

Name: ____________________ 62 Curriculum Connection

Definitions

What do the terms below mean?

Term	Definition
Incentive Program	
Custo Loyalty P	

Questi

e questions below

1) Why is it imp busi t repeat business from customers?

2) What is an example of a customer loyalty progr o y this program works?

Making Connections

Write about one customer loyalty program you hav aken part in. How did you benefit from it and how did the business benefit?

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

Name: _____

Mark
/5

Is the statement true or false?

1) Incentive programs are only made to reward employees for meeting sales goals.	T	F
2) A "Buy One, Get One Free" deal is an example of a customer loyalty program.	T	F
3) In a points program, you must always redeem your points for cash.	T	F
4) Acquiring new customers is generally more expensive than keeping existing ones.	T	F
5) In Sephora's loyalty program, spending more leads to better rewards and access to exclusive services.	T	F

Name: _____

Mark
/5

Is the statement true or false?

1) Incentive programs are only made to reward employees for meeting sales goals.	T	F
2) A "Buy One, Get One Free" deal is an example of a customer loyalty program.	T	F
3) In a points program, you must always redeem your points for cash.	T	F
4) Acquiring new customers is generally more expensive than keeping existing ones.	T	F
5) In Sephora's loyalty program, spending more leads to better rewards and access to exclusive services.	T	F

Name: _____ §4

Curriculum Connection: X.X.X

Evaluating Customer Loyalty Programs

Participating in customer loyalty programs has its advantages and disadvantages. When we use these programs to buy things we need, these programs are helpful in us getting more value for our money. But, when we are encouraged to spend money on things we wouldn't have normally bought, we may waste our money and regret not saving it.

Scenarios	Explain if the person should participate in the loyalty program or not
Scenario 1	Stella has bought a coffee from a coffee shop every day for the last [illegible]. Today, she is offered a stamp card where if she buys 10 coffees, [illegible] one free.
Should Stella join? Explain.	
Scenario 2	Jacob [illegible] from a new store he visited. They offered him [illegible] if he uses it in the next 10 days.
Should Jacob make sure to use his 5% off in the next 10 days? Explain.	
Scenario 3	Emily travels a lot for work. She refills her [illegible] Petro Canada offers a card that gives $0.10 off [illegible] uses their gas stations.
Should Emily use the card and go to only Petro gas stations? Explain.	
Scenario 4	Ryan rarely stays in hotels, but he went to a Marriott Hotel yesterday. They offered him 100 points for every night he stays with them. If he gets 2000 points, he gets a free night stay.
Should Ryan join Marriott Hotel's loyalty program?	

Research – Customer Loyalty Programs

Think of a brand and do some research into the customer loyalty program they offer. For example, search: "Nike Customer Loyalty Program" and you will discover that Nike has a membership program that offers you free shipping, workouts and training plans, as well as contact with Nike styling experts.

Research Answer the questions below to complete your research

1) What b... any did you choose?

2) Ho... rogram work?

____

____

____

____

3) What benefits do customers ... jo... program? Why would people join?

____

____

____

____

4) Do you think it is worth it to the customer to join the progr... Wh... disadvantages of joining the program?

____

____

____

____

5) Would you join this program? Explain your reasoning.

____

____

____

____

Name: _____ 66

Buying Second-Hand – More Value

Money is hard to earn, which means we should be careful when we spend it. Using these strategies can help you get more value for your money.

1) Taking part in customer loyalty and incentive programs
2) Waiting for things you need to go on sale
3) Purchasing second-hand items

Questions Answer the questions below

1) Have you ever purchased something second-hand? Did you get a good deal? Explain.

2) Where can you find second-hand items in your community?

3) If you were buying a used phone second-hand, what questions would you have for the seller?

4) How is buying things second-hand better for the environment?

5) Buying things second-hand can be sometimes unsafe. How could you ensure your safety when buying things second-hand?

Name: _____ 67

Choosing a Credit Card

Avion Travel Card

- Get 35,000 welcome points (value up to $750
- Earn 1 Rewards point for every dollar you spend
- Use Reward points to choose from a massive catalogue of awesome items
- 19.99% [illegible] rate
- Cost p[illegible] $120
- No fo[illegible] conversion fee

Rewards+ Card

- $0 yearly fee – that's right, free!
- Get 1,500 welcome Reward points
- Earn up to 3,500 additional Reward points by getting your monthly statements sent by email
- Earn 1 Reward point for every $1 spent on gas, grocery, and drug store purchases
- Earn 1 Reward point for every $2 spent on all other purchases
- Use Reward points to choose from a massive catalogue of awesome items
- 18.99% interest rate
- 3% foreign currency conversion fee

Decision Time! If yo[illegible] per[illegible] which account would you choose?

Scenario 1	Easton travels on a [illegible] r. He also drives to the United States once a mont[illegible] card there.
Which credit card should Easton choose?	
Scenario 2	Grayson travels a lot for his work. He goes on a [illegible], but he drives a lot. He complains he spends too much [illegible] stays within Canada.
Which credit card should Grayson choose?	
Scenario 3	Autumn is looking for a card that won't cost her much. She likes the idea of getting rewards but is more interested in low fees.
Which credit card should Autumn choose?	

Name: ____________________ 68

Curriculum Connection
F1.6

Pros/Cons Write the pros and cons of both cards below

Avion Travel Card	
Pros	**Cons**

[illegible]ards+ Card	
Pr[illegible]	**Cons**

Questions Answer the question below

1. Which credit card would you choose? Explain your choice.

____

____

____

2. Do you think the rewards are as important as the interest rates? Explain.

____

____

____

Name: _____ 69

Researching Credit Cards

Informed consumers do their research before making big purchases or before signing up for services, like credit cards. Do your research by comparing 2 different credit cards. Most banks offer their own credit card services. Search whichever bank you are most interest in.

Directions
1) Search online: (name of your bank) credit card offers
2) Fill in the tables below for 2 different credit cards

Research: Fill in the tables below to learn more about these credit cards

Name of Credit Card #1		Name of Credit Card #2	
Annual Fee		Annual Fee	
Interest Rate		Interest Rate	
Reward Points		Reward Points	
Other Offers		Other Offers	

Name: _____ 70

Create Credit Card Offers - Assignment

Assignment You are hired by a credit card company to make 2 credit card offers

You are hired by a credit card company to create 2 credit card offers that will make the company a lot of money, but will also entice customers to sign-up. Create two different offers, one with a higher annual fee and lots of rewards and one that is free with less rewards.

1) Who should get the first option of credit card? Describe the benefits.

2) Who should get the second option of credit card? Describe the benefits.

Name: _____ 71

Consumer Contracts

A **consumer contract** is when a customer signs an agreement with a business for them to provide a service to them in exchange for money. Examples of some popular consumer contracts are:

- Cell phone contracts
- Internet and TV
- Music and video streaming services
- Video games/apps

When cus[illegible]ign a consumer contract, they are signing up for a pre-determined length of time. [illegible] the average consumer contract for a cell phone is a 2-year contract.

[illegible]tract, we are agreeing to pay a pre-determined amount of money for t[illegible] If we use more than the services outlined in our contract, we could be charged [illegible] charges need to be explained in the consumer contract.

It is imp[illegible]ch before signing a consumer contract. You should compare offer[illegible] bus[illegible] ensure you are getting good value for your money. Once you have sign[illegible] get out of the contract until the agreed upon date. Many music and [illegible] one-month contracts.

Questions Answer the qu[illegible]

1. Write down 5 specific consumer contracts that [illegible] Netflix

2. Why is it important to shop around before signing a mul[illegible]

Task Create a cell phone contract below. Fill in the details to finalize the contract

Name of Cell Phone Plan	
Monthly Cost	
Amount of Data in GB	
Canada-Wide Calling	

International Calling	
Text, Video, and Photo Messaging	
Number of Years of Contract	
Free Offers *Ex: Free tablet*	

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Why do you think companies want people to sign long-term contracts? Do you think it benefits the company or the customer more? Explain.

Name: _____

Why do you think companies want people to sign long-term contracts? Do you think it benefits the company or the customer more? Explain.

Name: _____

Why do you think companies want people to sign long-term contracts? Do you think it benefits the company or the customer more? Explain.

Name: _____

Why do you think companies want people to sign long-term contracts? Do you think it benefits the company or the customer more? Explain.

Name: _____ T3

Research Cell Phone Plans

Research Find 2 cell phone plans online and fill in the details of each plan below

Buying a cell phone from most companies requires customers to sign a 2-year contract. Before signing a contract, customers need to understand how they plan to use the phone so they can choose a plan that fits their needs.

Name of Cell Phone Plan #1	
Monthly Cost	
Amount of Data in GB	
Canada-Wide Calling Details	
International Calling Details	
Text, Video, and Photo Messaging	
Free Offers	
Extra Details	

Name of Cell Phone Plan #2	
Monthly Cost	
Amount of Data in GB	
Canada-Wide Calling Details	
International Calling Details	
Text, Video, and Photo Messaging	
Free Offers	
Extra Details	

Name: _____ 74

Pros/Cons Write the pros and cons of both cell-phone plans below

Cell Phone Plan 1	
Pros	Cons

Phone Plan 2	
Pros	Cons

Questions Answer the questions below

1) Who should get the first option of cell phone? Explain why.

2) Who should get the second option of cell phone? Explain why.

Name: _____ /5

Financial Literacy – Unit Test

	US Dollar	Euro	Yen	Pounds	Australian Dollar
$1 CAD	$0.80	€0.73	¥90.00	£0.60	$1.10

	1 USD	1 Eur	1 Yen	1 Pound	1 Australian Dollar
In CAD	$1.25	$1.45	$0.011	$1.70	$0.92

Part 1 — Convert the CAD to other currencies

	CAD	Other Currency	$
1)	$[illegible]		
2)	$130		
3)	$455	Australian [illegible]	

	CAD	Other Currency	$
4)	$1200.52	US Dollar	
5)	$1550.67	Pound Sterling	
6)	$2698.53	Japanese Yen	

Part 2 — Use < > = to compare the [illegible]

1)	$25.00CAD		¥450.00JPY
2)	$29.50USD		$35.65CAD
3)	$19.76CAD		$23.41AUD

4)	[illegible]		$109.79AUD
5)	$[illegible]		¥975.98JPY
6)	$[illegible]		€[illegible]56EUR

Part 3 — How much will the item cost in CAD with a 3% conversion [illegible]

	Cost Purchase Price (P.P.)	Cost in CAD *Apply Exchange Rate*	3% Conversion Fee of P.P.	Total Cost
1)	$25 USD			
2)	$75.00 AUD			
3)	¥5000.75 JPY			
4)	€285.46 EUR			
5)	£486.85 GBP			

Part 4 Answer the questions below

1)	Charles earned $63,500 from his job. He also earned $12,300 from selling some investments. He paid $11,343 in taxes. What is his net income.	
2)	Sofia earned $52,750 from her job last year. She also earned $1500 from her rental property each month. She paid $18,300 in taxes. What is her net income?	
3)	Dexter earned $72,670 from his job and $18,345 from his side-job. He paid $24,5[illegible] taxes. What is his gross income?	
4)	Nic[illegible]204 from her job and she won $979,324 from the lottery [illegible] taxes. What is her net income?	
5)	Luc[illegible] earn[illegible] from his job. He also sold a rental property and earn[illegible] pa[illegible],212 in taxes. What is his net income?	

Part 5 Fill in thi[illegible]ter[illegible] missing values

	Gross Income	Tax	Net Income
1)	$95,542		$70,701.08
2)		$42[illegible]	$126,154
3)	$98,542	$28,483	
4)		$24,456	
5)	$163,489		

Part 6 Calculate the cost of borrowing the principal for 3 and 8 years

#	Principal	Interest Rate	3-Year Loan	8-Year Loan
1)	$3000	7%		
2)	$4500	19%		
3)	$7000	8%		
4)	$12,000	5%		
5)	$22,000	3.25%		

Part 7 Answer the questions below

1) If you borrow $950 for 5 years with an annual interest rate of 8%, how much interest will you pay?

b) How much in total will you pay?

2) How much interest will you have to pay if you borrow $725 for 2 years at a 12% annual interest rate.

Part 8 [illegible] mean?

Term	Definition
Compound Interest	
Customer Loyalty Program	
Consumer Contracts	
Balanced Budget	
Gross Income	

Google Slides Lessons Preview

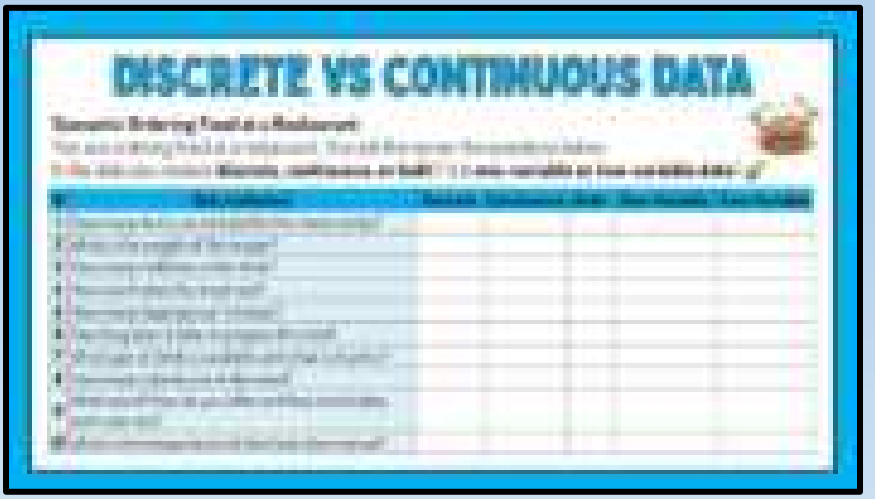
Ontario Math Curriculum
Data & Probability – Grade 8

3-Part Lesson Format

Part 1 – Minds On!
- Learning Goals
- Discussion Questions
- Quotes
- And More!

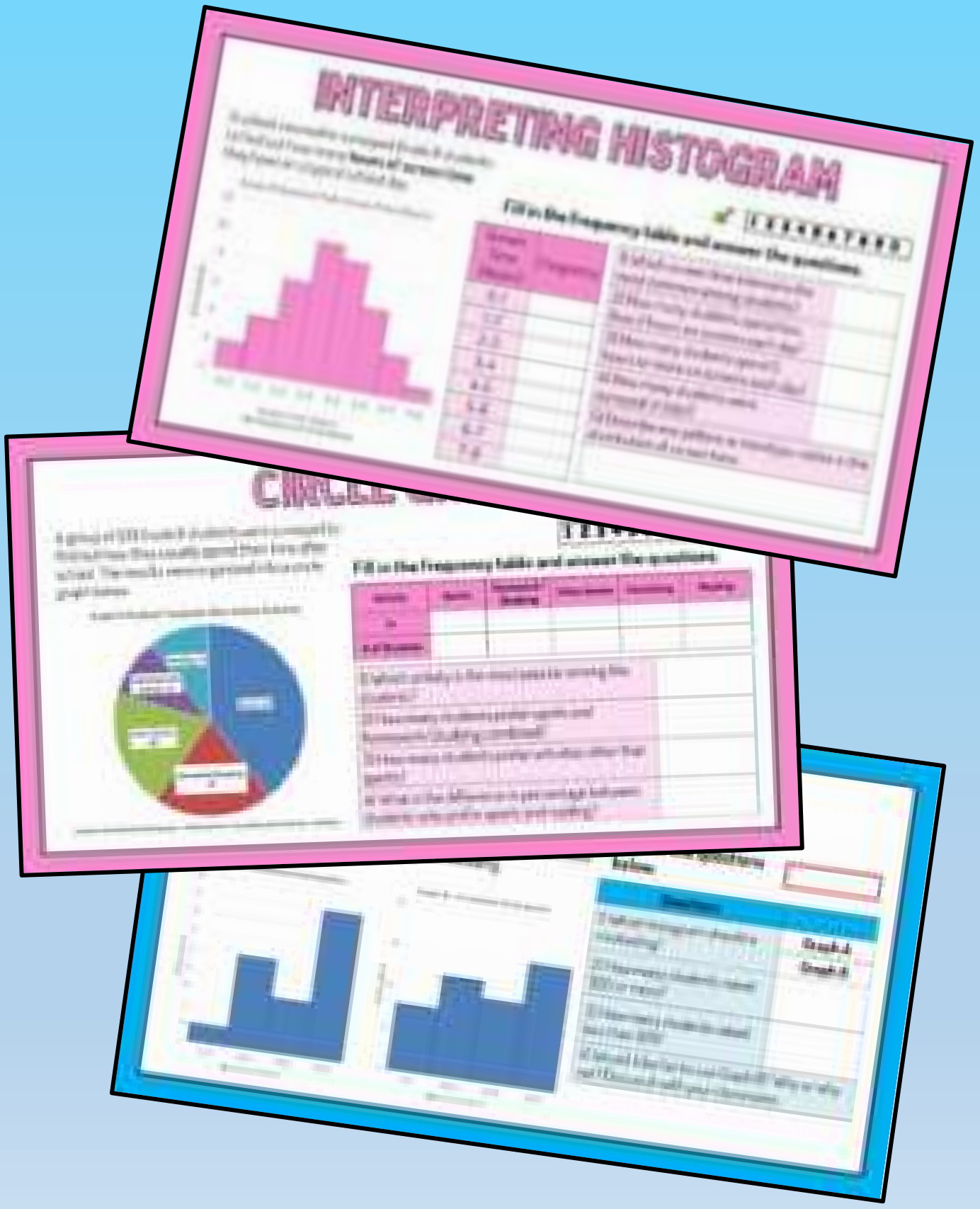
Part 2 – Action!
- Writing
- Matching
- Drag and Drop
- Drawing
- And More!

Part 3 – Consolidation!
- Exit Cards
- Quizzes
- Reflection
- And More!



Ontario Math Curriculum
Data & Probability – Grade 8

Ontario Math Curriculum
Data & Probability – Grade 8



Workbook
Preview

Grade 8
D1. – Data Literacy

	Curriculum Expectations	Pages That Cover the Expectations
D1.1	identify situations involving one-variable data and situations involving two-variable data, and explain when each type of data is needed	8 – 10, 15,
D1.2	collect continuous data to answer questions of interest involving two variables, and organize the data pairs as appropriate in a table of values	5 – 7, 11 – 14, 45, 47, 54, 56, 68, 73, 77, 83, 85
D1.3		8, 55, , 76,
D1.4	create an infographic about a data set, representing the data in appropriate ways, including in tables and scatter plots, and incorporating any other relevant information that helps to tell a story about the data	93 – 98
D1.5	use mathematical language, including the terms "strong", "weak", "none", "positive", and "negative", to describe the relationship between two variables for various data sets with and without outliers	32 – 40
D1.6	analyse different sets of data presented in various ways, including in scatter plots and in misleading graphs, by asking and answering questions about the data, challenging preconceived notions, and drawing conclusions, then make convincing arguments and informed decisions	16 – 28, 41 – 44, 49 – 53, 58 – 67, 70 – 72, 75, 79 – 81, 99 – 118

Name: _____ 8

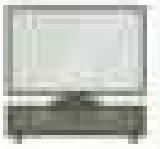
One-Variable vs Two-Variable Data

A **variable** is any attribute, number, or quantity that can be measured or counted.

One-variable data has one set of data that could be qualitative or quantitative.

Examples

(1) Length of arm span for grade 8 students (2) Favourite movie of grade 8s



Two-variable data has two sets of data that could be qualitative or quantitative

Examples

(1) Relationship between a person's arm span and their height

(2) How many hours people read and their IQ levels

Part 1 Is it one-variable or two-variable data? Use a checkmark ✓

	Example	One-Variable	Two-Variable
1)	Favourite sp[illegible]nion		
2)	Average temper[illegible]ch month		
3)	Length of arm span wi[illegible]s		
4)	How far Liam ran each day last we[illegible]		
5)	Mia's test scores and how much sl[illegible]e get		
6)	How far you drive to work and how much [illegible]y your job		
7)	Number of siblings each student has in your class		
8)	Relationship between screen time of students and homework completed		

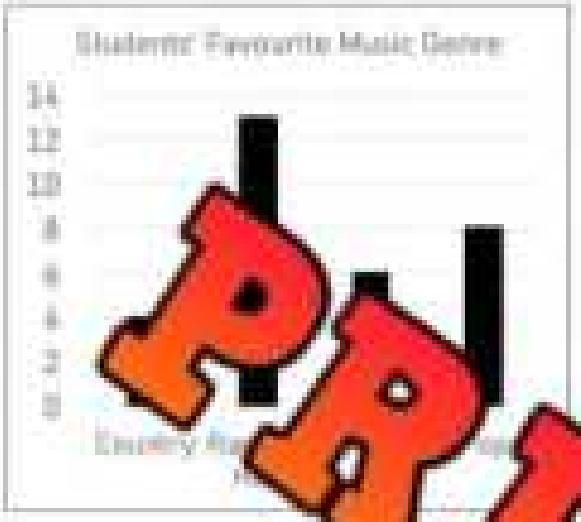
Part 2 Write your own examples of one-variable and two-variable data

		Example
1)	One-Variable	
2)	One-Variable	
3)	Two-Variable	
4)	Two-Variable	

Name: _____ 9

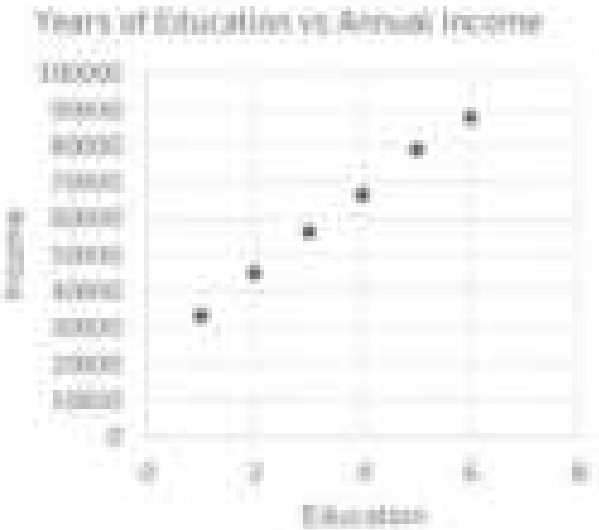
One-Variable vs Two-Variable Data

Directions Does the graph represent one or two variables? Describe both variables



1)	Does the graph represent one or two variables?
2a)	Describe variable number 1
2b)	Describe variable number 2 (if applicable)

1)	Does the graph represent one or two variables?
2a)	Describe variable number 1
2b)	Describe variable number 2 (if applicable)



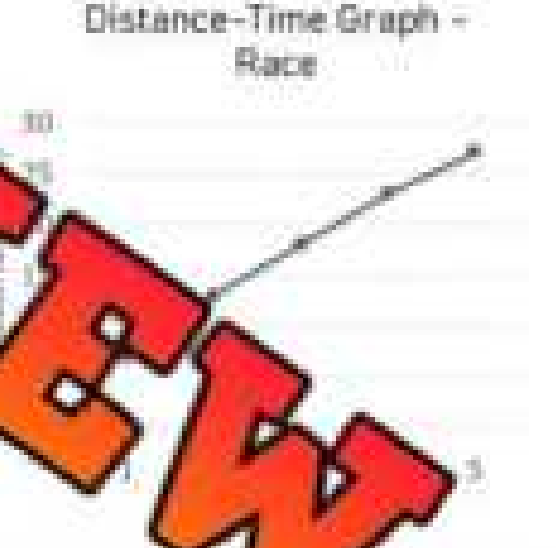
1)	Does the graph represent one or two variables?
2a)	Describe variable number 1
2b)	Describe variable number 2 (if applicable)

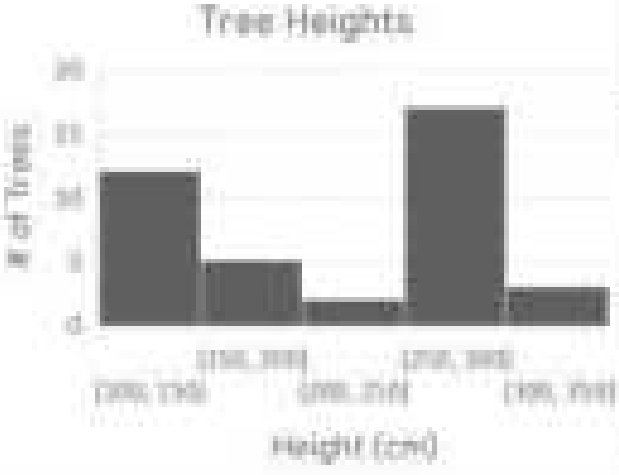
Name: _____ 10

Directions Does the graph represent one or two variables? Describe both variables

1)	Does the graph represent one or two variables?
2a)	Describe variable number 1
2b)	Describe variable number 2 (if applicable)

1)	Does the graph represent one or two variables?
2a)	Describe variable number 1
2b)	Describe variable number 2 (if applicable)





1)	Does the graph represent one or two variables?
2a)	Describe variable number 1
2b)	Describe variable number 2 (if applicable)

Name: ______________________ 11

Representing Distribution Using Percentages

Why Use Percentages?
Percentages are used to show the distribution of a variable. Using percentages makes the data easier to read than simply just using the frequency.

For example: Which table is easier to draw conclusions from?

Ways I Get To Work	
Personal Vehicle	3558
[illegible]	241
[illegible]	[illegible]
[illegible]	[illegible]
Total	[illegible]

Ways I Get To Work			
Personal Vehicle	3558	0.71	71%
Bike	231	0.5	5%
Walk	752	0.15	15%
Bus	459	0.09	9%
Total	5000	1.00	100%

Questions Fill in [illegible] percentages and decimals

1) Favourite Colour			
Options	Frequency	Decimal	%
Blue	2560		
Red	2123		
Pink	1575		
Green	3742		
Total			

2) [illegible] Music Genre			
[illegible]	[illegible]	Decimal	%
[illegible]	[illegible]		
[illegible]	[illegible]		
Rap	[illegible]		
Country	[illegible]		
Total			

3) Top 50 Movies All Time – Genres			
Options	Frequency	Decimal	%
Comedy	11		
Action	15		
Drama	22		
Horror	2		
Total			

4) Best Season to Travel			
Options	Frequency	Decimal	%
Summer	12845		
Fall	5207		
Winter	24543		
Spring	7405		
Total			

Name: _____ 12

Frequency Tables Versus Relative Frequency Tables

Frequency Tables Versus Relative Frequency Tables
A **relative frequency table** displays the percent of each option in a data set. These relative frequencies are calculated by dividing the frequencies for each option by the total number of frequencies for all options.

A **frequency table** only lists the frequencies belonging to each group. Frequency tables are harder to generate comparisons between options in a data set.

Questions ...the tables. Is the table a frequency table or relative frequency table?

1) N... ...ed Per Order			
Options	Fr...	...in	%
0	3...		
1-2	99		
2-3	56		
4+	11		
Total			
Relative Frequency Table		Frequency Table	

2) How Many Trees On Your Property	
Options	Frequency
0	754
1-5	3165
...10	6485
...	9616
...otal	
R... ...y	...equency Table

3) Musical Instrument You Play		
Options	Frequency	
None	154	
Guitar	125	
Piano	110	
Other	111	
Total		
Relative Frequency Table	Frequency Table	

4) Type of V...		...inal	
Options	Frequency		%
Car	26714		
Van	6485		
Truck	11452		
Motorbike	3349		
Total			
Relative Frequency Table		Frequency Table	

Name: _____ 13

Discrete or Continuous Data?

Discrete and continuous data are both forms of quantitative data. This means both are numerical, meaning the data is acquired through counting or measuring.

Discrete data is collected when the answers to a survey are only numbers. It is quantitative data that has no relationship between the numbers. For example, "how many pets you have" is discrete data because there is no relationship between 1 and 2 pets. You cannot have 1 and a half pets, only 1 or 2. Discrete data is counted.

With **Continuous data**, there is a relationship between the numbers. For example, "how much rain fell there was last week?" You can have 1 and a half millimetres of rain, which means there is a relationship between 1 and 2. Continuous data is measured.

Part 1 ...om the research question be discrete or continuous?

Tip: Ask yours... ...er in half.

	Discrete/Continuous
1) How many cousins do ...	
2) Which subject is your favou...	
3) How many minutes did you study for ...	
4) How many millimetres did your her ...	
5) How many books have you read in the last ye...	

Part 2 How many variables does the data have? Is the ... or both?

Research Question	One/... Variable	...us/Both
1) How many homeruns a team scored last season		
2) How many steps you take in a day and how many calories you burn		
3) Most popular drink ordered at a café and what gender orders which drink		
4) Type of vehicle and its fuel economy		
5) Height of a dog and its weight over 5 years		
6) How many dunks a basketball player had last season		
7) Favourite music genre and what year you were born		
8) Practice time and results in a music festival		

Name: _____ 16

MEAN

Mean = the average in a set of data

Step 1: Add up the numbers in the data set

Step 2: Divide the sum by the amount of numbers in the set.

Example:

Data set: 5, 6, 8, 5

Step 1: 5 + 6 + 8 + 5 = 24

Step 2: 24 ÷ 4 = (6)

Part 1 Find the mean for each data set below

	Data Set	Total – Add Numbers	Mean
1)	16, [illegible] 18		
2)	41, 48, [illegible]		
3)	121, 105, 129, [illegible]		
4)	5.2, 6.8, 4.3, 7.7		
5)	12.5, 14.8, 15.7, 9		
6)	-5, -7, -9, -3		
7)	-22, -31, -28, -26		
8)	-78, -95, -141, -62		
9)	7, -8, 4, -11		
10)	3.8, -4.2, 2, -1.6		

Part 2 Answer the word problems below

1) Emma is trying to figure out her handicap in golf. A handicap is your average score. She golfed 10 times this year and had the following scores. What is her handicap?

-4, -8, 5, 4, -2, -5, 0, 7, -3, -4

2) Hudson recorded his screen time in minutes for the last 5 days. What was his average screen time for the last 5 days in minutes and hours?

147, 168, 262, 241, 197

Name: _____ 17

Finding Missing Data Point Using Mean

We can determine the missing number in a series if we know the mean by using the following formula:

$$\text{Mean} = \frac{\text{sum of given numbers + (unknown number)}}{\text{total numbers}}$$

Example: 25, 27, ?, 30 Mean = 26

Steps

1) Multiply the number of total numbers you have by the mean (26 x 4 = 104)
2) Add the numbers you know (25 + 27 + 30 = 82)
3) Find the difference (subtract) between 104 and 82 (104 – 82 = 22) – Answer = 22

Questions Use the steps above to find the missing data point

	Data Set	Mean	Calculations	Missing Data Point
Ex)	9, 16, ?, 22, 12, 19	15	19 = 78	12
1)	8, ?, 7, 13, 12, 11	11		
2)	27, 19, 14, ?, 53	27		
3)	37, 22, 48, ?, 62, 77	50		
4)	-8, -5, -13, ?	-8		
5)	-15, ?, 17, -17, -7	-2		

Name: _____ 18

Finding Missing Data Point Using Mean

Questions | Answer the word problems below

1) The average temperature last week was -5°C. The temperatures for each day of the week have been represented in the table below. The table is missing the temperature for Friday. Calculate the missing temperature.

Day	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Tem		-7	-4	-8		3	-4

2) Gas prices for the last ... were ... ge of $1.34 per litre. The prices for each day are listed below. ... Calculate the missing value for day 3.

Day	1	2	3	4	5	...	8	9	10
Price	1.31	1.45		1.36	1.2...			1.24	1.22

3) A diver plunged an average of -6.8m in her 8 dives last week. The depth of her dives are recorded in the table below, but her last dive is missing. Calculate the depth of her last dive.

Dive	1	2	3	4	5	6	7	8
Depth	-5.7	-4.2	-8.6	-7.4	-2.2	-6.7	-7.2	

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

Name: _____

1) The mean depth for water dives is -4.8 m. Find the missing depth for Dive 4.

Dive	1	2	3	4	5	6	7	8	9
Depth	-5.9	-4.5	-6.8		-2.5	-3.8	-4.7	-5.6	-3.9

2) The mean daily price over the 9 days is $1.38. Find the missing price for Day 4.

Day	1	2	3	4	5	6	7	8	9
Price	1.41	1.38	1.42		1.30	1.44	1.39	1.36	1.35

Name: _____

1) The mean depth for water dives is -4.8 m. Find the missing depth for Dive 4.

Dive	1	2	3	4	5	6	7	8	9
Depth	-5.9	-4.5	-6.8		-2.5	-3.8	-4.7	-5.6	-3.9

2) The mean daily price over the 9 days is $1.38. Find the missing price for Day 4.

Day	1	2	3	4	5	6	7	8	9
Price	1.41	1.38	1.42		1.30	1.44	1.39	1.36	1.35

Name: _____ 20

Task Cards: Mean Detective

Objective — What are we learning about?

To help students understand and solve for a missing data point in a set by using the mean (average).

Materials — What you will need for the activity

- [illegible]
- Sheets of paper for answers
- Pencils

Instructions — How to complete the activity

1. Introduce the concepts covered in the [illegible]
2. Organize the students into pairs and provide each pair with their sets of task cards.
3. Give each pair an answer recording sheet and pencils.
4. Encourage teamwork by having students collaborate with their partners on finding solutions.
5. Allow students to select any task card to begin with, emphasizing that they can complete the cards in any order they prefer.
6. Instruct students to record the letter of their chosen answer (A, B, or C) on their answer sheet beside the task card's number.
7. Consider using a timer to create a dynamic challenge, adjusting the duration to fit the lesson's objectives and complexity.
8. After the activity, review the answers collectively, discussing any challenging questions and strategies used to solve them.
9. Have students reflect on the activity, sharing the methods they applied and obstacles they overcame.

Name: _____ 21.

Task Cards | Cut out the task cards below

Card 1:
Find the missing value in the series: 45.2, ?, 48.6, 49.8, 44.1, 47.5, if the mean is 47.

a) 46.8
b) 46.5
c) 46.0

Card 2:
The temperatures in a city over six days were: 14.5°C, 16.1°C, 13.9°C, ?, 17.3°C, 15.0°C. The mean temperature was 15.2°C. What was the temperature on the missing day?

a) 14.9°C
b) 13.6°C
c) 14.7°C

Card 3:
The average h… is 23.4 cm. The heig… plants … cm, 24.1 cm, 23.2 cm, … cm, … cm. What is the heig… ?

a) 23.2 cm
b) 24.0 cm
c) 22.9 cm

Card 4:
The temperatures recorded over five days were: -3.5°C, -4.0°C, ?, -5.2°C, -3.9°C. If the mean temperature was -4.2°C, what was the missing temperature?

a) -4.4°C
b) -4.2°C
c) -4.0°C

Card 5:
The mean of the numbers 11.5, 13.2, 14.1, ?, 13.7, and 12.8 is 13.2. Find the missing number.

a) 13.5
b) 12.5
c) 13.9

Card 6:
… player scored 22, … 21 po… the average score … the …

a) …
b) 19
c) 23

Card 7:
A worker earned an average of $450 per week over 6 weeks. His weekly earnings were $470, $440, $455, $465, and $425. How much did he earn in the 6th week?

a) $445
b) $435
c) $450

Card 8:
The average distance of five runners in a run was 12.4 km. Four of the runners ran distances of 12.8 km, 11.9 km, 12.1 km, and 12.6 km. What was the missing runner's distance?

a) 12.2 km
b) 12.6 km
c) 12.5 km

Name: _____ 23

Task Cards | Cut out the task cards below

Card 17:
A baker baked an average of 120 cupcakes per week over 5 weeks. The cupcakes baked in four weeks were: 115, 125, 118, and 123. How many cupcakes did the baker bake in the fifth week?

a) 122
b) 120
c) [illegible]

Card 18:
The mean of the values 27.6, 25.9, 26.4, 24.8, and ? is 26.5. What is the missing number?

a) 28.2
b) 26.8
c) 27.6

A cyclist rode [illegible] km over 5 days. [illegible] km, how many [illegible] ride on the [illegible]

a) 6 km
b) 5.7 km
c) 5.6 km

Card 20:
A business earned an average of $-5,400 per week over 4 weeks, and their earnings in 3 of those weeks were $-5,800, $-5,200, and $-5,600. What were their earnings in the missing week?

a) $-5,200
b) $-5,000
c) $-5,400

Card 21:
The mean of the numbers 48.9, 50.2, 49.1, ?, and 50.4 is 49.5. What is the missing number?

a) 48.7
b) 48.8
c) 49.3

A [illegible] score of 72% in five [illegible] scores were 75%, 70%, 74%, ?, and [illegible] test scores?

a) 71%
b) 72%
c) 73%

Card 23:
A car traveled at speeds of 80, 75, 85, 82, and ? km/h over 5 hours. If the average speed was 81 km/h, what was the missing speed?

a) 80 km/h
b) 78 km/h
c) 83 km/h

Card 24:
The average score of 7 players on a basketball team is 10.5 points. The points scored by 6 players are 9, 12, 11, 10, 8, and 13. How many points did the missing player score?

a) 10.5
b) 10
c) 12

Name: _____ 24

Task Cards: Mystery Mean Detectives

Answers Record your answers below

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	

Name: ______________________ 25

Outliers in Data Sets

An **outlier** in a data set are values that are significantly different from other measures. They may mean that something has gone wrong in the data collection, or they may represent a valid measure that needs further explanation.

Part 1 Circle any outliers in the data sets below

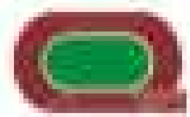
1)	25, [illegible] 30, 3, 29, 36, 34, 71	4)	-4, -8, -6, -21, -9, -7, 12, -5
2)	14[illegible] 79, 294, 147	5)	-9.4, -29.6, -8.7, -7.9, -10.1, -9.6
3)	[illegible] 4, 15 [illegible] 5, 11.6, 21.7	6)	1.1, 0.5, -0.4, -1.5, 13, -0.8, -24.2, 1.3

Part 2 A[illegible] the q[illegible] below

1) Owen practiced his 400 [illegible] the stopwatch that automatically record his times on a compu[illegible] 49.5, 52.3, 138.1, 51.7, 49.8, 52.2

a) Which of his scores was an outlier?

b) What might have caused the outlier [illegible]?



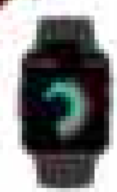
2) Tony looked at how many steps he took last wee[illegible] took over the last 7 days are recorded below:

11243, 13178, 9135, 20891, 12485, [illegible]

a) Which of the values are outliers?

b) Explain why he may have an outlier of 3878 steps?

c) Why might Tony have an outlier of 20891 steps?



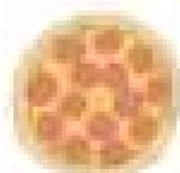
3) Chris owns a pizza shop. His profits for the last 7 days are listed below.

$142, $165, $152, $177, $843, $0, $162

a) Which of the values are outliers?

b) Explain what could have led to Chris earning $0 profits on day 6?

c) Explain what could have led to Chris earning $843 on day 5?



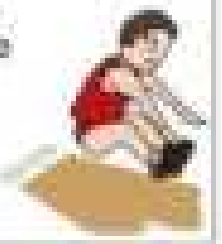
Name: _____ 26

Calculating Mean - Outliers

Outliers have a big impact on the mean of a data set. For example, if John records his last 5 long jumps and jumps the following distances:

6.5m, 6.8m, 1.5m, 6.2m, 6.1m

John explains after that on his third jump, he slipped and didn't perform a full jump. The data set has an outlier that doesn't reflect John's ability to jump. We can see the difference when we use an outlier in our calculation of the mean



Mean W
Mea

Part 1 ... ing the outlier and without the outlier

	Data S	Outlier(s)	Mean Without Outlier(s)
1)	14, 14, 15, 68, 17		
2)	-5, -2, 38, -4, -6, -1		
3)	0.5, 0.8, -24.7, -0.4, 0.3		
4)	-16.7, 15.7, 13.9, 14.2, 16.4		
5)	-5.3, 13.4, -6.8, -6.1, -25.9		

Part 2 Answer the word problem below

1) Explain what happened in question 5. Why was the mean similar even ... e outliers?

2) Cole has been playing very well in golf. His last 10 golf scores are listed below

-2, 18, 3, -4, -1, 1, 4, -6, -4, -3

a) What is his handicap over the last 10 games?

b) If he removes the outlier, what would his handicap be?

Name: _____ 27

Calculating Mode and Median - Outliers

Part 1 Calculate the mode using the outlier(s) and without the outlier(s)

	Data Set	Mode With Outlier(s)	Mode Without Outlier(s)
1)	11, 1[illegible], 13, 17, 25, 88, 21, 12, 11, 18		
2)	138, [illegible], 144, 465, 144, 138, 144		
3)	[illegible], 15.8, 15.5, 15.8		
4)	[illegible]12, -[illegible], -[illegible], -3		
5)	-0.5, [illegible], 0.9, [illegible]		

Do outliers have an [illegible] Explain why or why not.

Part 2 Calculate the median using the [illegible] outlier(s)

	Data Set	Median With Outlier[illegible]	[illegible]r(s)
1)	15, 13, 19, 14, 17, 19, 67		
2)	108, 105, 308, 106, 107, 109		
3)	24.3, -8.2, 25.7, 24.6, 27.2, 26.1		
4)	-14, -19, -17, -22, 21, -24		
5)	-1.3, 0.1, 0.6, -0.5, 13.8, -1.2		

Do outliers have an effect on the median? Explain why or why not.

Name: _____ 29

Mean, Median, Mode – Outliers Word Problem

Questions | Answer the questions below

Alex loves golf. He has kept track of his last 10 shots for 4 different clubs. He wrote down the distance in yards he hit each of the clubs in the table below.

	1	2	3	4	5	6	7	8	9	10
Pitching	132	143	137	24	134	136	132	130	133	132
7		161	237	168	163	164	168	164	158	153
		204	193	198	199	209	42	201	198	198
Driver			315	307	322	299	303	314	52	311

a) Calculate the mean distance for each of the four clubs Alex used?

	Pitching Wedge	7 Iron	3 Iron	Driver
Mean				

b) Calculate the median distance for each club.

	Pitching			Driver
Median				

c) Calculate the mode of each club.

	Pitching Wedge	7 Iron	3 Iron	Driver
Mode				

d) Look for some outliers in the data. What could have caused these outliers?

e) To calculate the average distance of all four clubs combined, find the mean of the medians for each club.

Name: _____ 32

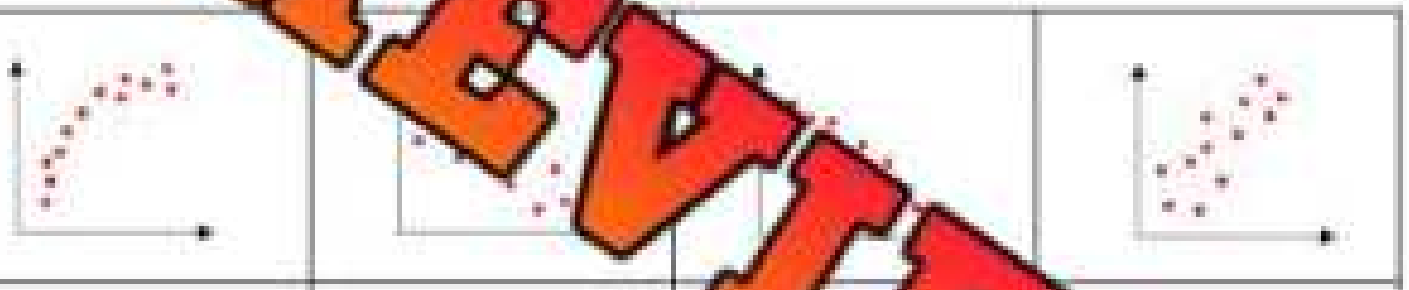
Relationship Between Variables

A scatter plot is a graph in which the values of two variables are plotted along the x and y axis. Using a scatter plot allows us to quickly see what type of relationship there is between the two variables.

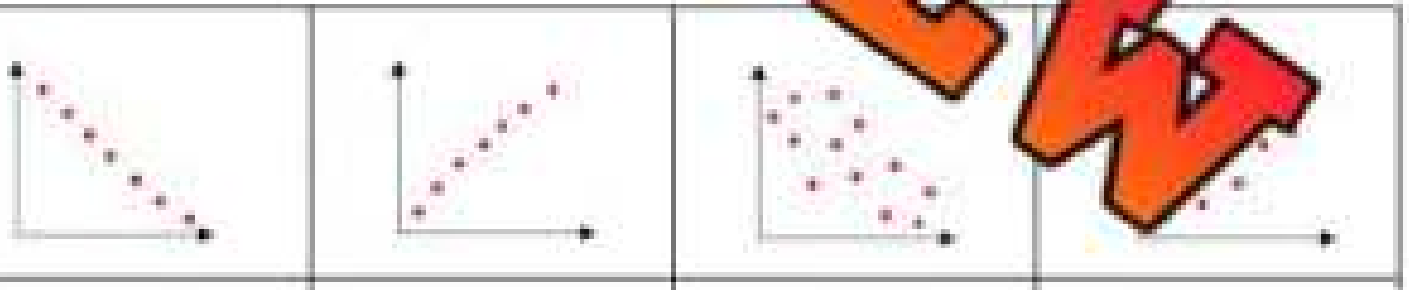
Weak Negative Relationship | Weak Positive Relationship | Strong Negative Relationship | Strong Positive Relationship | No Relationship

Practice

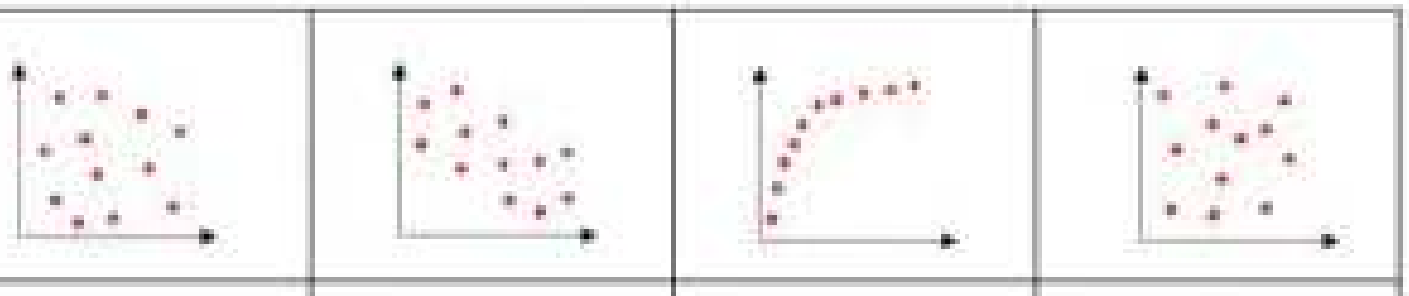
Determine the relationship between the variables



1) 2) 3) 4)



5) 6) 7) 8)

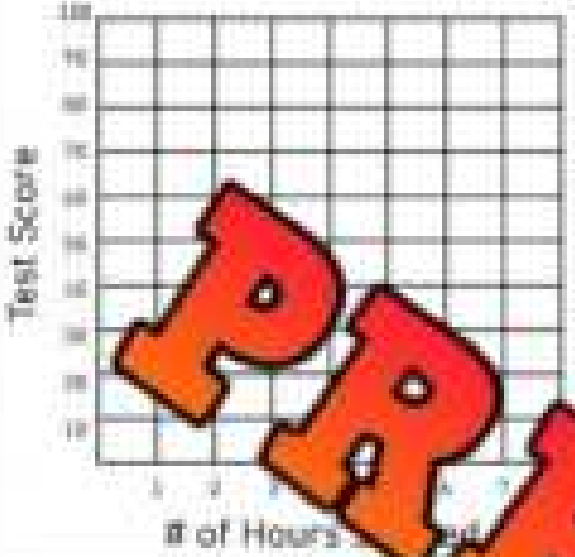


9) 10) 11) 12)

Name: _____ 33

Scatter Plot – Relationship Between Variables

Practice Plot the points on the scatterplot and answer the questions

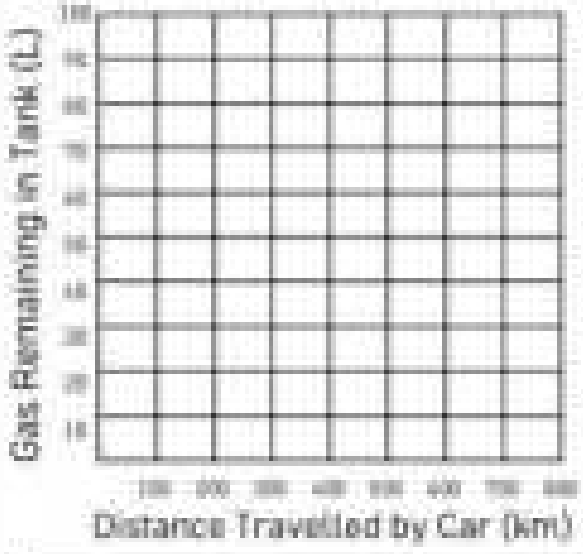


# of Hours Studies	Test Scores
6	90
2	55
1	45
3	70
4	75
7	95
5	80

1) What is the relationship between the variables?

2) Are you surprised about the relationship between the variables? Explain.

3) Could you have predicted the relationship between these variables without graphing the data? Explain



Distance (km)	Gas in Tank
100	70
200	58
300	45
400	31
500	20
600	10
700	0

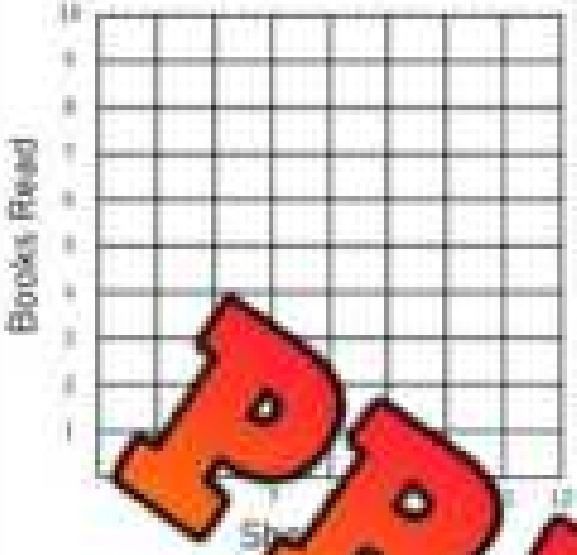
1) What is the relationship between the variables?

2) Are you surprised about the relationship between the variables? Explain.

3) Could you have predicted the relationship between these variables without graphing the data? Explain.

Name: _____ 34

Practice Plot the points on the scatterplot and answer the questions

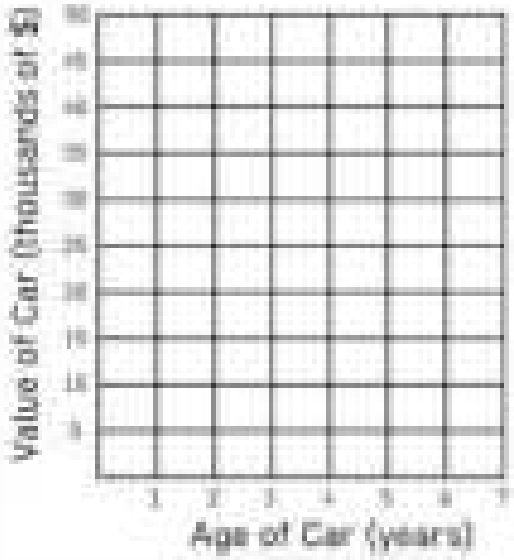


Shoe Size	Books Read
5	6
6	6
8	4
7	2
10	7
6	10
11	3

1) What is the relationship between the variables?

2) Are you surprised about the relationship between the variables? Explain.

3) We've learned [illegible] how many books someone reads. Write another example of [illegible] have no relationship.



Age	Value
4	35
6	10
7	15
1	55
3	45
4	40
5	20

[illegible]	[illegible]
2	[illegible]
1	35
6	5
5	35
7	2
3	15
4	25

1) [illegible] the relationship between the variables?

2) [illegible] about the relationship between the variables? Explain.

3) Write another example of two variables that would likely have a similar relationship.

Name: _____ 35

Explaining Relationship Between Variables

Explain Describe what type of relationship the variables would have. Explain.

	Variable 1 (x-axis)	Variable 2 (y-axis)	Relationship
1	Hours worked	Money earned	
Explain			

	Variable 1 (x-axis)	Variable 2 (y-axis)	Relationship
2		Test scores	
Explain			

	Variable 1 (x-axis)	Variable 2 (y-axis)	Relationship
3	Number of car payments made	Amount owed on car loan	
Explain			

	Variable 1 (x-axis)	Variable 2 (y-axis)	
4	Number of people in a family	Temperature the family keeps their house	
Explain			

	Variable 1 (x-axis)	Variable 2 (y-axis)	Relationship
5	Minutes of exercise	Calories burned	
Explain			

Name: _____ 36

Explaining Relationship Between Variables

Explain Describe what type of relationship the variables would have. Explain.

	Variable 1 (x-axis)	Variable 2 (y-axis)	Relationship
1	Time it takes to get to school (minutes)	Distance (metres) a student lives from school	
Explain			

	Variable 1 (x-axis)	Variable 2 (y-axis)	Relationship
2	Hours ... a class	...mber of absences in a class	
Explain			

	Variable 1 (x-axis)	Variable 2 (y-axis)	Relationship
3	Time the water is being heated (minutes)	Temper... the	
Explain			

	Variable 1 (x-axis)	Variable 2 (y-axis)	Relationship
4	Students' height	Students' grades	
Explain			

	Variable 1 (x-axis)	Variable 2 (y-axis)	Relationship
5	Time spent practicing free throw shooting	Number of free throws missed each game	
Explain			

Name: _____ 37

Brainstorming Variables With Different Relationships

Your Turn! Write your own variables that would have the relationship provided

1)	Strong Positive Relationship
Variable 1	
Variable 2	
Explain	

2)	Weak Positive Relationship
Variable 1	
Variable 2	
Explain	

3)	[illegible]
Variable 1	
Variable 2	
Explain	

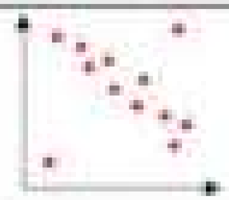
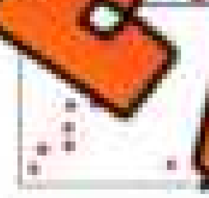
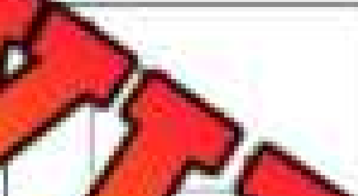
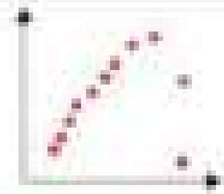
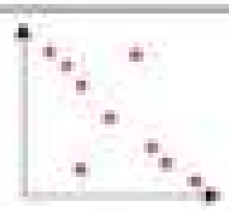
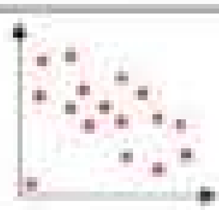
4)	Weak Negative Relationship
Variable 1	
Variable 2	
Explain	

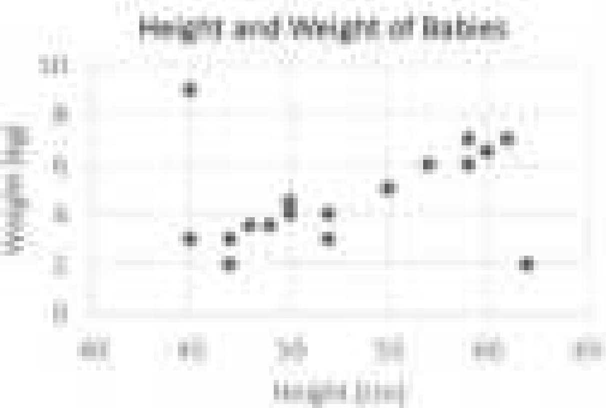
5)	No Relationship
Variable 1	
Variable 2	
Explain	

Relationship Between Variables - Outliers

When determining the relationship between variables, it is possible that the data has an outlier. An outlier could mean that something went wrong with the data collection, or it may be a valid, unexpected piece of the population that needs further clarification. In many cases, the outlier can be removed so that we can determine the relationship between the variables more accurately.

Practice [illegible] describe the relationship

			
1)	2)		
			
5)	6)	7)	8)



1) Which values are outliers?	
2) What is the relationship between the variables?	
3) What caused these outliers?	

Name: _____ 39

Relationship Between Variables - Outliers

Practice Answer the questions about the scatter plot

1)

1) Which values are outliers?	
2) What is the relationship between the variables?	
3) What caused these outliers?	

2)

1) Which value	
2) What is the rela... between the variable...	
3) What could have caused the outlier?	

3)

1) Which ...	
2) What is the re... between the variab...	
3) What caused these outliers?	

4)

1) Which values are outliers?	
2) What is the relationship between the variables?	
3) What caused these outliers?	

Name: _____ 40

Line of Best Fit

A line of best fit can be drawn through the majority of the points on a scatter plot. It can be used to make predictions if the relationship between the 2 variables is strong.

When drawing a line of best fit, we can try to use the following criteria:

- Draw the line in the middle of the data
- Have equal points on both sides of the line
- Points are an equal distance from the line

Remember – drawing a line of best fit is not an exact science. We should **try** to meet the criteria above, but it will not always be possible. The more y[illegible] follow this criteria, the better your line of best fit will be.

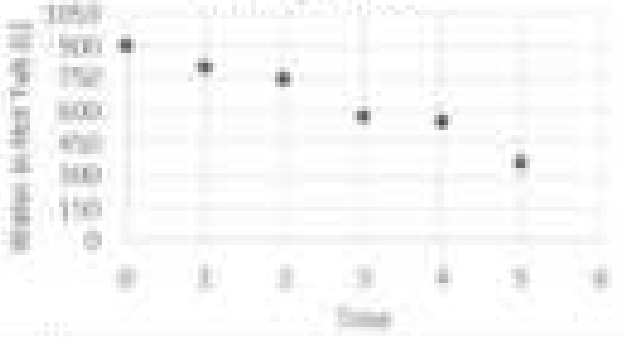
A good [illegible] allows us to make predictions about the data. The line of best fit in the examp[illegible] it to[illegible] prices for tickets in 2030 will be around $47.

Practice

Draw a [illegible] fit a[illegible] to make a prediction

1)	What will the temperature be at 4000m?

2)	How much wi[illegible] hours?



3)	What height would someone be with 195cm arm span?

4)	How much water will be in the tub after 4 hours?

Name: _____ 41

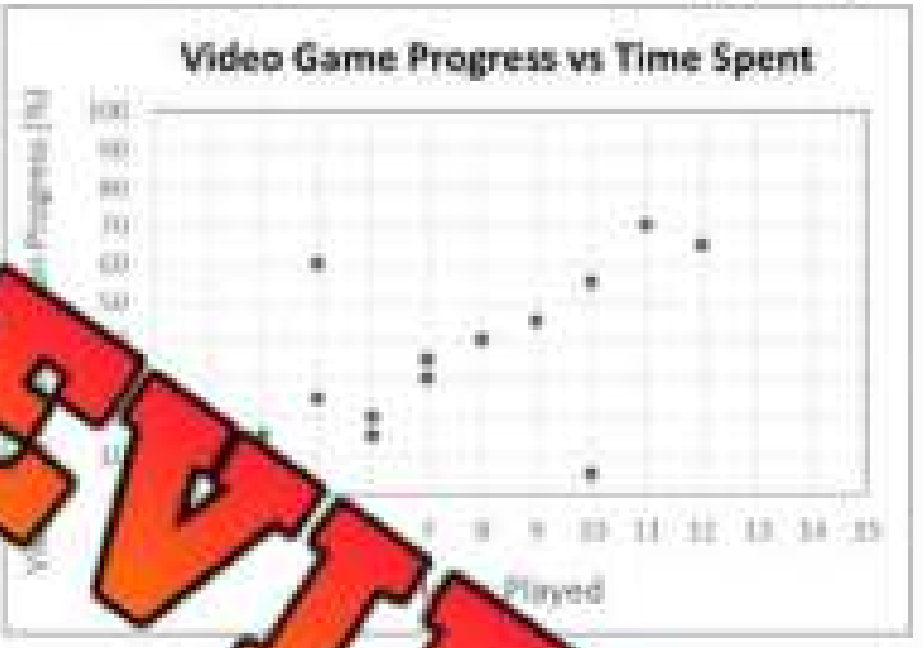
Interpreting Scatter Plot – Video Games

15 people were given a video game and were asked to track their progress in the game and how long they played it for. The results have been represented in the scatter plot below.

Practice | Answer the questions below

Fill in the table of values by reading the scatter plot. Assume each value has been rounded to the nearest whole.

X-Value	



1) What a[illegible]

2) What could explain [illegible]

3) How many people finished over half of the game?

4) How many people finished less than 30 percent?

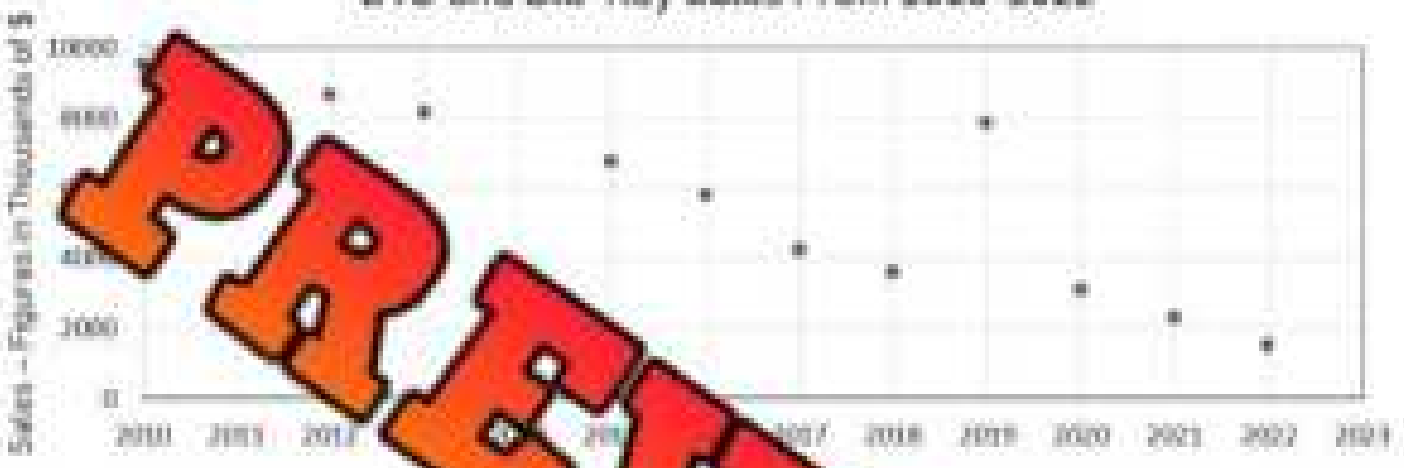
5) Draw a line of best fit. How far do you think a person would get if they played for 15 hours?

Name: _____ 42

Interpreting Scatter Plot – DVD/Blu-Ray Sales

The sales from 2010 to 2022 of blue-ray and DVD's are presented in the scatter plot below.

Practice Answer the questions below



1)	What are the outliers in the data?
2)	What could explain the outliers?
3)	What is the relationship between the two variables? Is it strong/weak, positive/ negative?
4)	Which years were the top 5 in sales?
5)	Draw a line of best fit. How many sales do you think there will be in 2023?
6)	How many sales were made in 2022? How many dollars were sold?

Name: _____ 43

Creating a Scatter Plot – Gold Rush Population

Directions Display the data below in a scatter-plot

The population in Dawson City fluctuated a lot due to the gold rush. The population has been displayed in the table below. Represent the data in a scatter-plot.

Year	1894	1895	1896	1897	1898	1899	1900
Popula (in thou	1	1	30	35	40	8	6

Interpreting The Data Provide at least 3 conclusions you can draw from the graph.

Name: _____ 44

Creating a Scatter Plot – Lemonade Sales

Directions Display the data below in a scatter plot

Zackary sells lemonade at the end of his driveway. He tracked his sales for the last 17 days and he also tracked the temperature as he wanted to learn more about his business. Represent his data on the scatter plot below.

Temperature °C	# of Sales
24	6
20	3
28	16
25	12
27	17
29	4
29	20
30	18
21	2
26	12
24	10
28	16
25	13
	4
	2
	19
	18

Interpreting The Data Answer the questions below

1) What two outliers did you notice?	
2) What could have caused the outliers?	
3) Draw a line of best fit. How many sales would you expect on a day that is 31°C?	

Name: _____ 45

Collecting Primary Data – Scatter Plot

Brainstorm Display the data below in a scatter-plot

Areas of Interest (basketball, video games, music, etc.)	

Research Circle the graph you would use to represent the data

Res (Ex.	

Hypothesis Do you expect a ... variables? Explain the type and why

Example I expect a strong negative relationship because the more screen time someone has the less time they have to exercise.	

Draw a table that will help you collect and organize your data.

Name: _____ 66

Creating a Scatter Plot

Use the data you collected to plot your graph. Remember the following labels:

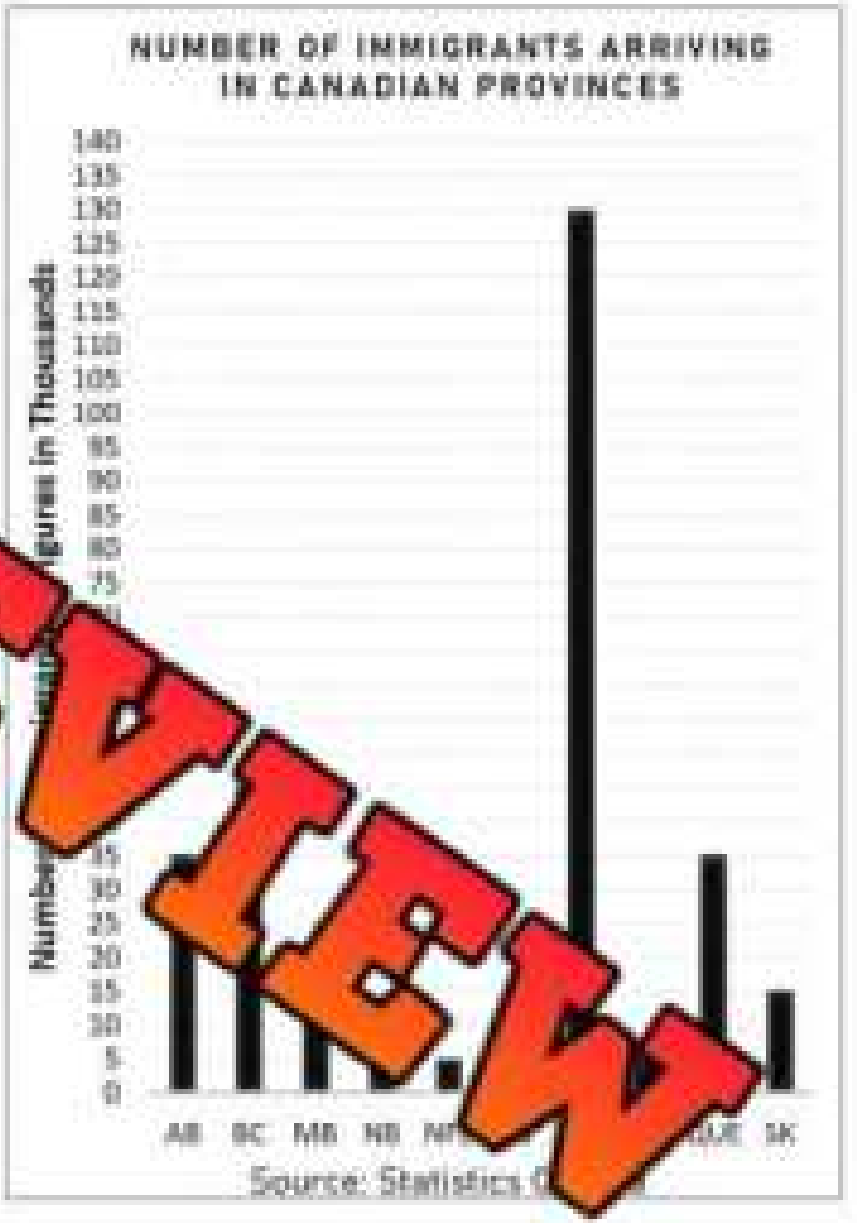
X axis label ☐ Y axis label ☐ Title ☐ Scale ☐ Value for y-axis ☐

Name: _____ 50

Vertical Bar Graph – Immigration

Canada is a popular place for people from other countries to move to. The number of immigrants who moved to Canadian provinces is represented in the bar graph. Fill in the frequency table below.

[illegible]	[illegible]
MB	
NB	
NFL	
NS	
ON	
PEI	
QUE	
SK	
Mean of Canada	
Mode of Canada	
Median of Canada	



a) How many more immigrants moved to Ontario than New Brunswick?	
b) Did more immigrants move to Ontario than all the other provinces combined?	
c) Is the data quantitative or qualitative?	
d) Was the data collected from a primary or secondary source?	
e) In your opinion, what is one reason why more people immigrate to Ontario?	

Name: ____________________

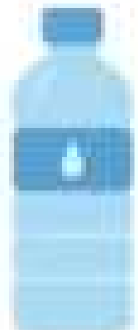
Activity Title: Flip the Data

Objective — What are we learning about?

Students will engage in a fun and active game where they read data from a bar graph and answer questions to earn the opportunity to flip a bottle or cup. This activity combines data interpretation skills with a physical challenge, adding excitement and a competitive element to learning.

Materials — What you will need for the activity

- ... cup ... g
- A sm... board ... display bar graphs
- Timer (sto... ... p)
- Question ca... on ... data
- Scoreboard to k...



Instructions — How you w... p...

1. Divide the class into small teams, ideally of 5 ... ude...
2. Prepare a series of bar graphs to display ... mar... ith corresponding question cards that ask about ...
3. One team at a time comes to the front where the g...
4. Display the first bar graph on the smartboard.
5. The first student from the active team reads the graph and sel... ard. Start the timer when the question is first shown.
6. The student answers the question based on the data presented in the graph. The teacher checks the answer.
7. If the student answers correctly, they flip their bottle or cup repeatedly until they land it upright. When they do, the next teammate can take their turn.
8. If the student's answer is incorrect, they must try another question card before they can attempt to flip.
9. The team's turn ends either when all members have successfully flipped their bottle/cup or when the timer reaches a set limit (e.g., 3 minutes).
10. Record the team's time or number of successful flips on the scoreboard.
11. Repeat steps 4-10 for each team. The team with the fastest time wins.

Name: _____ 60

Graph 1	What did you learn from the graph?

Name: _____ 62

Graph 3 | What did you learn from the graph?

Name: _____ 65

Graph 6 | What did you learn from the graph?

Name: _____ 66

Graph 7 | What did you learn from the graph?

Name: _____ 67

Questions Choose a question to ask the student who is about to flip their bottle

What is the title of the graph?
What is the title of the Y-axis?
What is the title of the X-axis?
What does each bar on the graph represent?
Which ca[illegible] shows the highest values for both bars?
Which c[illegible] the lowest values for both bars?
How [illegible] displayed on the graph?
What is the r[illegible] on the Y-axis?
What is the tot[illegible] represented by all bars?
What is the differenc[illegible] highest and lowest categories for both bars?
Are there any categories that [illegible] ch ones?
How does the value of one specific [illegible] compare to others?
What could be a possible reason for the hig[illegible]lue?
What could be a possible reason for the lowest [illegible]
What trends can you observe from the graph?
How might this data be useful?
If you could add another category to this graph, what would it be?
How would you describe the overall distribution of data?
What insights or conclusions can you draw from this graph?
How might the information on the graph impact decisions or opinions?
What are the 2 sets of data representing?
Name one surprising fact from this data
What scale was used in this graph?
What is a different scale that you could use in this graph?

Name: _____ 70

Multiple-Bar Graph – Favourite Social Media

The students in grade 6, 7, and 8s were asked which social media app was their favourite. The results have been sorted by grade in the multiple-bar graph below.

Part 1 Fill in the frequency table by re… graph above

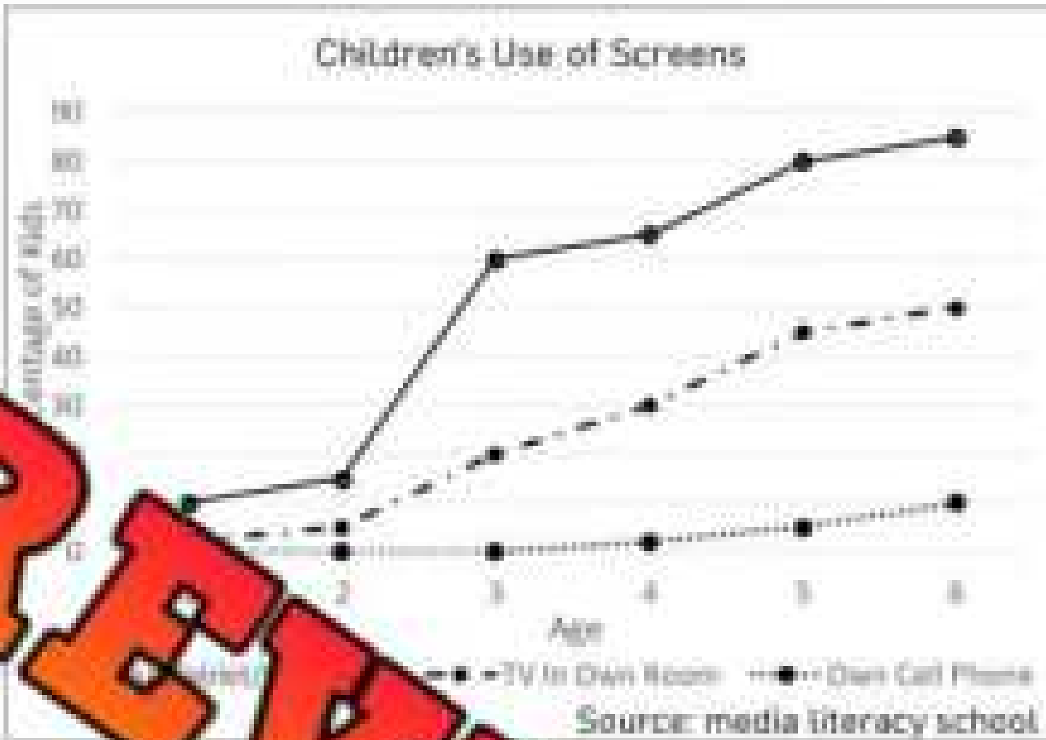
	6				8	
	#	%	#			%
Snapchat	15/130	12				
YouTube						
Tik Tok						
Facebook	30/130	23				
Instagram						
Total	/130					

Part 2 Answer the questions below

a) How many students in each grade were surveyed?	
b) Which social media was the most popular? How many votes did it get?	

Interpreting a Broken-Line Graph

Children are using screens younger and younger. The multiple-line graph represents the percentage of children w[illegible]ther use a tabl[illegible] compute[illegible] in the[illegible] room [illegible] ce[illegible] phone.



Questions Answer the que[illegible] belo[illegible]

1) What percentage of 5-year-olds use a tablet[illegible]

2) What percentage of 6-year-olds own a cell phone?

3) Is there a relationship between the two variables – age a[illegible] using screens?

____

____

4) At what age do most children start using a tablet/computer? Why do you think that is?

____

____

5) What do you think about this data? Is it good that children are using screens? Explain.

____

____

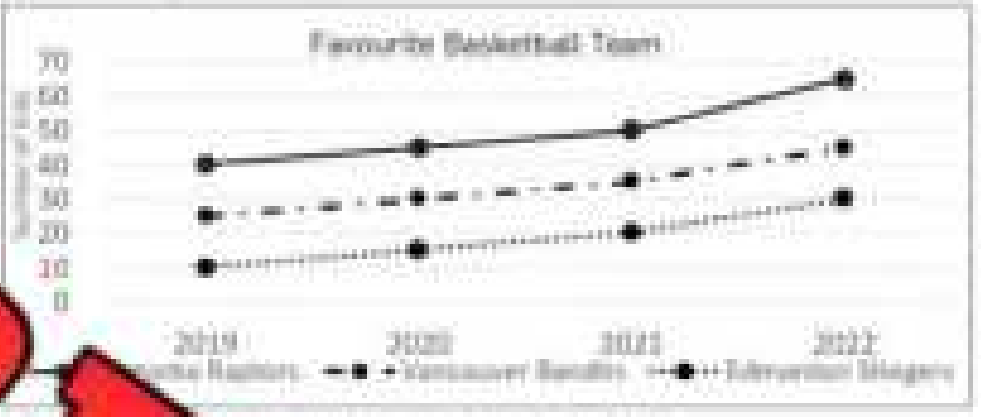
____

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

Name: _____

The graph represents how many students in a school like each of the Canadian basketball teams (Toronto Raptors, Vancouver Bandits, and Edmonton Stingers) as their favourite team. The data is collected over a 4-year period from 2019 to 2022.



1) How many students listed the Toronto Raptors as their favourite team in 2021?

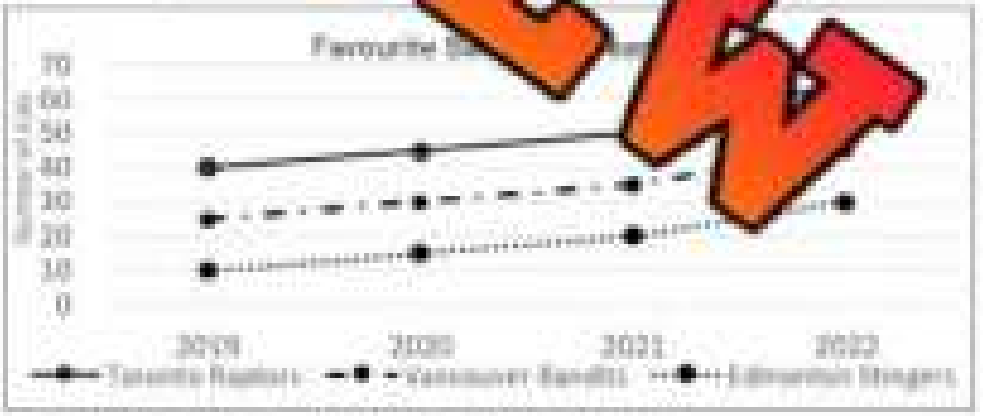
2) How much did the popularity of the Vancouver Bandits increase between 2019 and 2022?

3) What is the trend for the Edmonton Stingers' popularity over the 4-year period?

4) What conclusions can you draw about how popular basketball is in Canada?

Name: _____

The graph represents how many students in a school like each of the Canadian basketball teams (Toronto Raptors, Vancouver Bandits, and Edmonton Stingers) as their favourite team. The data is collected over a 4-year period from 2019 to 2022.



1) How many students listed the Toronto Raptors as their favourite team in 2021?

2) How much did the popularity of the Vancouver Bandits increase between 2019 and 2022?

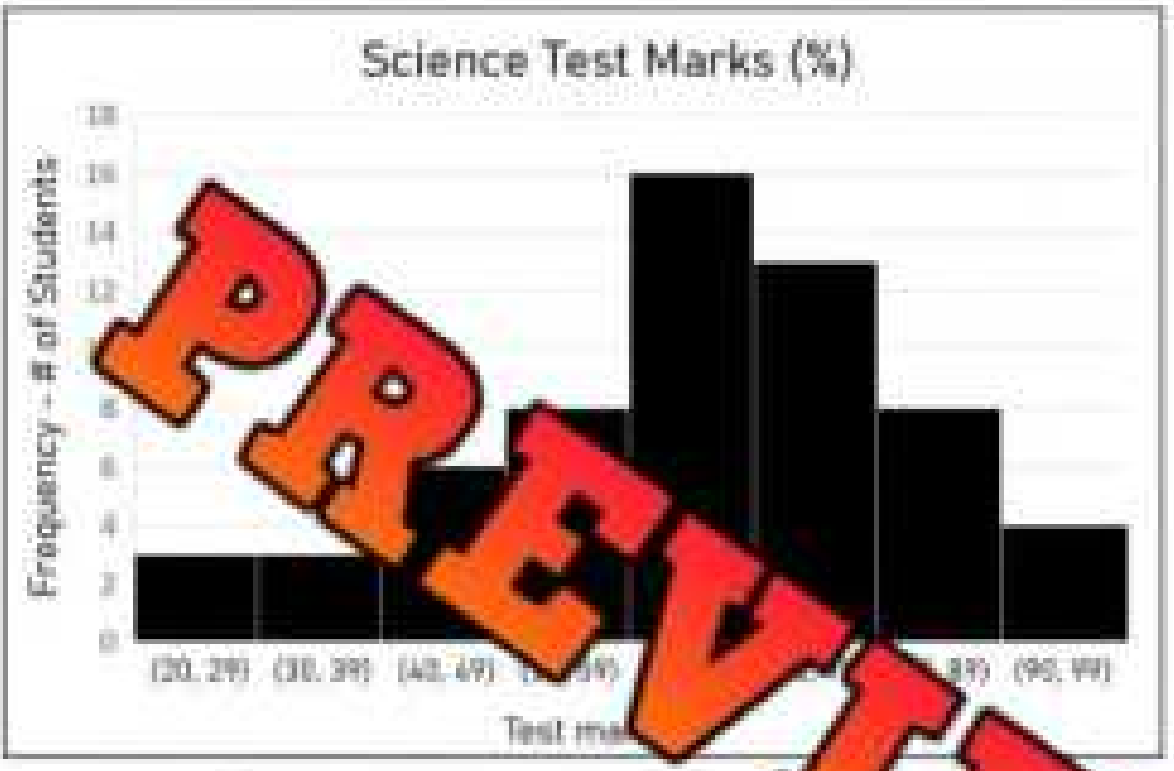
3) What is the trend for the Edmonton Stingers' popularity over the 4-year period?

4) What conclusions can you draw about how popular basketball is in Canada?

Name: _____ 75

Interpreting a Histogram

The science teacher posted a histogram of the results of the last test.



Questions Fill in the tables below

Frequency Table	
0-9	
10-19	
20-29	
30-39	
40-49	
50-59	
60-69	
70-79	
80-89	
90-99	

a) Which test score was most [illegible]?	
b) Did most people pass or fail?	
c) How many students failed the test [illegible]?	
d) How big are the intervals? What range of marks do they include?	
e) How many students took the test?	
f) How many students got an A (80%+)?	
g) Based on the results, do you think the test was easy, hard, or fair? Explain your thinking.	

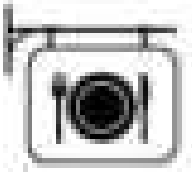
Name: _____ 76

Creating a Histogram

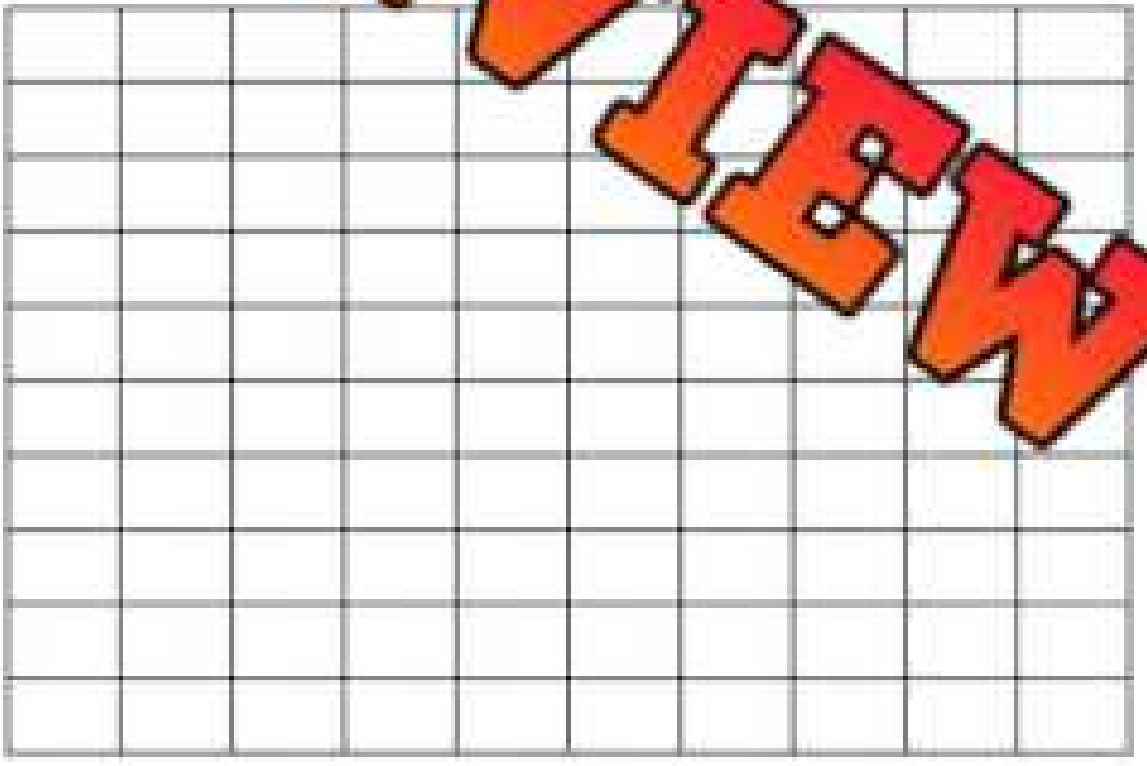
A **histogram** is used to display the frequency of numerical data. We can use a histogram to display continuous or discrete data, but only with quantitative data. If the data is qualitative, we would use a bar graph instead.

Directions Display the data below in a histogram

A restaur[illegible] wanted to know what age groups used his restaurant the mos[illegible] asked 30 customers their age. His data is pres[illegible]. Represent the data in a histogram.



15	18	[illegible]	[illegible]	25	28	13	33	55	57
62	21	[illegible]	[illegible]	[illegible]	0	30	44	41	58
68	61	72	[illegible]	[illegible]	[illegible]	9	42	53	64



Name: _____ 77

Collecting Data - Histogram

Data Collection Collect primary or secondary data and represent it in a histogram

Question of Interest	

Use the b... to organize your data.

Interpreting The Data Answer ... below

1) Was your data collected from a primary or sec... ce?

2) Why did you choose to learn more about this topic?

3) What conclusions can you draw from your data? What did you learn?

4) What further research should be done in relation to the topic you chose?

Name: _____ 78

Creating a Histogram

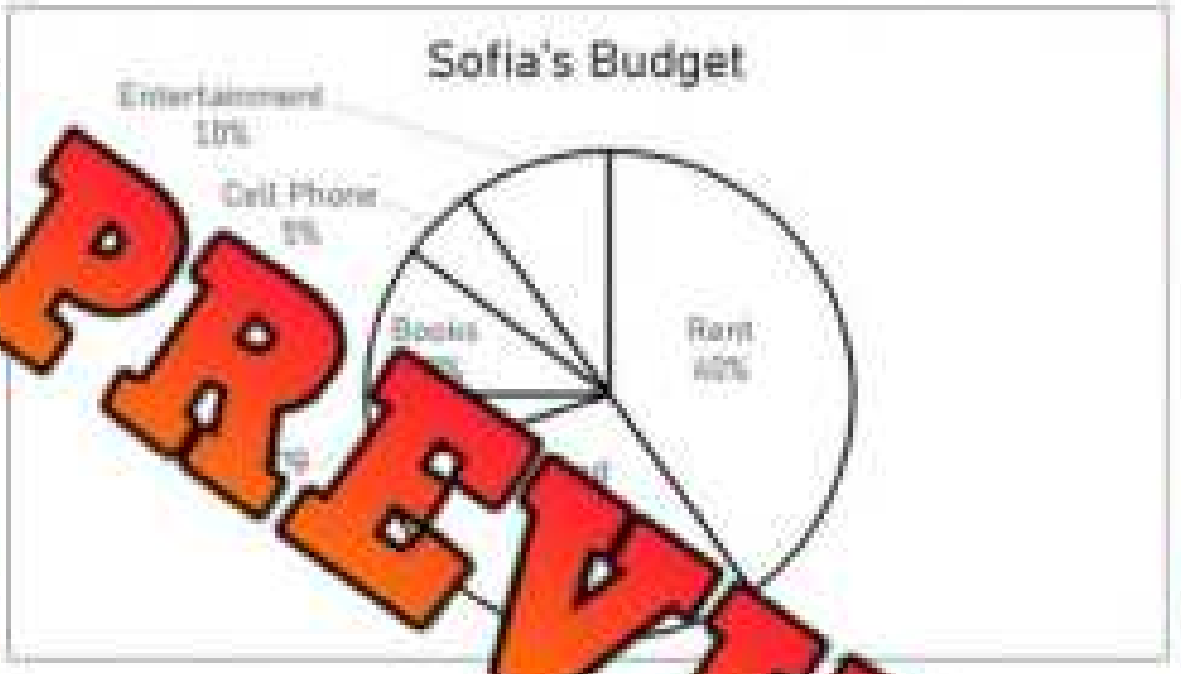
Use the data you collected to plot your graph. Remember the following labels:

X axis label ☐ Y axis label ☐ Title ☐ Scale ☐ Intervals/Bins ☐

Name: _____ 77

Circle Graph - Budget

Sofia is heading to college soon. She has $1000 to spend in total on the things she needs. She created a circle graph to better understand where her money is going.



Part 1 Fill in the frequency tab... graph

	Rent	Food	Clothing	Be...	...ll Pho...	...ntertainment
%						
$ Spent						

Part 2 Answer the questions below

1) What will Sofia spend most of her money on?	
2) Which two expenses will account for 70% of her money?	
3) How much money will she spend on everything except rent?	
4) What percentage do all 6 expenses add up to?	
5) What are your thoughts on her budget? How might your budget be the same or different?	

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

Name: _____

Alex is planning a vacation. He has $1500 to spend in total on various activities and needs. He created a circle graph to better understand how he will allocate his money.

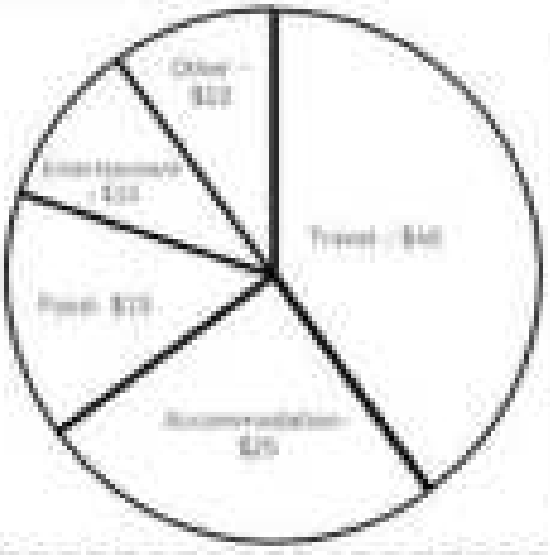
Alex's Vacation Budget

1) What will Alex spend most of his money on?	
2) Which two categories together account for 65% of his vacation budget?	
3) How much money will Alex spend on food and entertainment combined?	
4) What percentage do all 5 categories add up to?	

Name: _____

Alex is planning a vacation. He has $1500 to spend in total on various activities and needs. He created a circle graph to better understand how he will allocate his money.

Alex's Vacation Budget

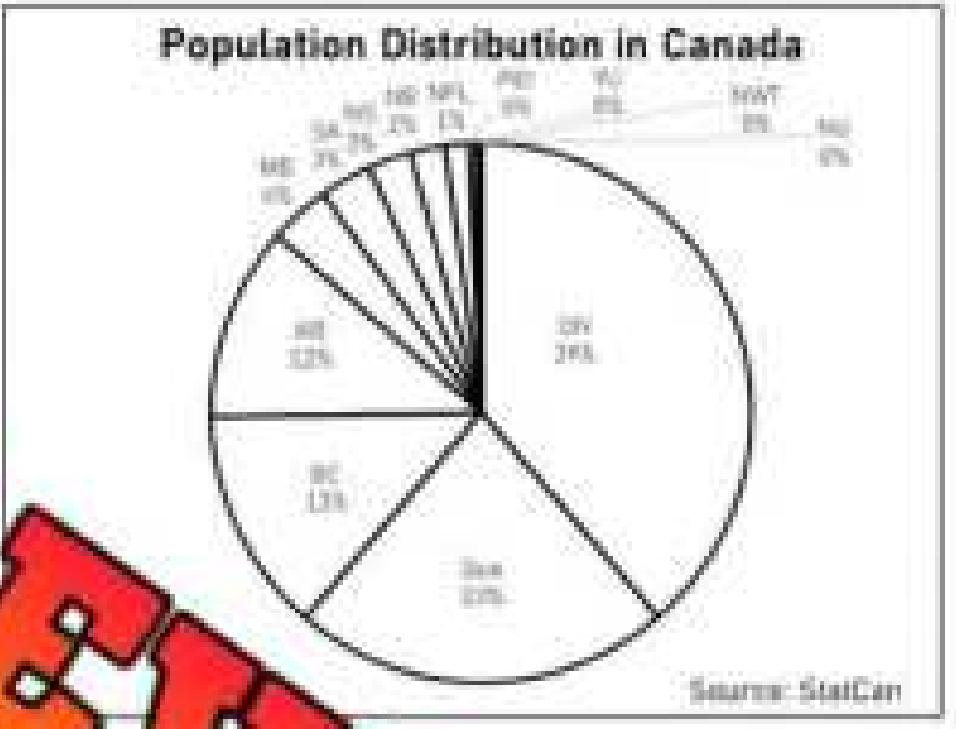


1) What will Alex spend most of his money on?	
2) Which two categories together account for 65% of his vacation budget?	
3) How much money will Alex spend on food and entertainment combined?	
4) What percentage do all 5 categories add up to?	

Name: _____ 01

Circle Graph – Population Distribution

The population of each province and territory in Canada has been displayed in the circle graph.



Part 1 Fill in the frequency by ... the circle graph

Province	AB	BC	MB	NB	NFL	NS	PE	SK	NWT	YU	NU
Population Distribution %											

Part 2 Answer the questions below

1) What percentage of Canadians live in Ontario and Quebec?

2) Do half of Canadians live in Ontario and Alberta?

3) Do half of Canadians live in Alberta, BC, and Quebec?

4) Martin thinks that more than 4 of 5 Canadians live in 4 provinces in Canada. Is he correct? Explain.

5) Why do you think not many Canadians live in the territories? Explain.

Name: _____ 82

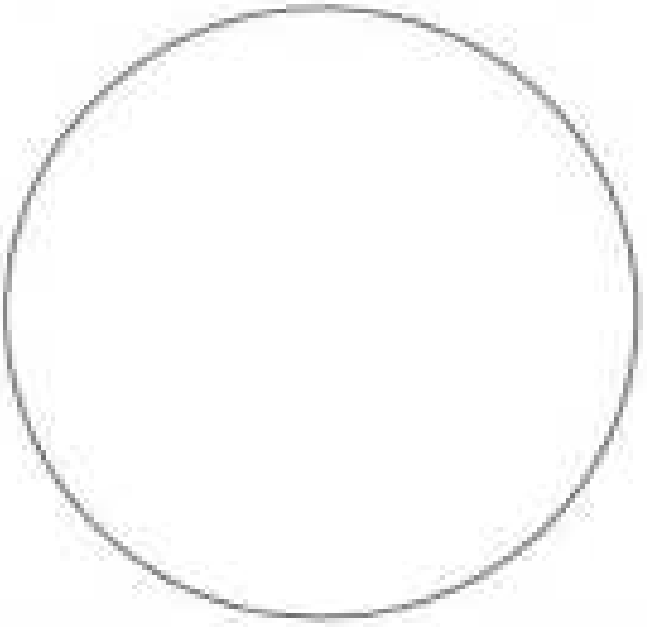
Drawing a Circle Graph – Global Emissions

According to the World Resources Institute, Canada accounts for approximately 2% of global greenhouse emissions. The emissions each country produces are listed in the table below.

Part 1 Fill in the table below to determine the angle measurements for the circle graph

	Relative Frequency (as a percentage)	Fraction	Decimal	Angle Measure
[illegible]	30	30/100	0.30	0.30 x 360 = 108°
[illegible]	15	15/100	0.15	0.15 x 360 = 54°
Europe	[illegible]			
Russia	[illegible]			
India	[illegible]			
Japan	[illegible]			
Brazil	2			
Canada	2			
Others	29			

Part 2 Use a protractor to draw the angles for [illegible] graph.



1) How many times [illegible] does China produce [illegible]

2) Why do graphs sometimes have an "other" category?

3) Why do you think China produces so many emissions?

Name: _____ 83

Collecting Qualitative Data – Circle Graph

Data Collection | Collect categorical data that you can plot using a circle graph

Question of Interest (Ex. Favourite _____ or which app ... use most)	

Draw a t... ...will help you collect and organize your data.

Interpreting The Data

1) Was your data collected from a primary or ... ...?

2) What conclusions can you draw from your data? Li... ...gs.

3) How will graphing this data as a circle graph help readers understand the data?

Name: _____ Bk

Creating a Circle Graph

Use the data you collected to plot your graph. Remember the following labels:

- ☐ Title
- ☐ Labels for each section
- ☐ Percentages/totals

CANADA'S POPULATION | JULY 1, 2020

Canada's population reached the 38 million mark between April 1 and July 1, 2020. However, the annual increase of 411,854 was the lowest since 2015/2016 due to international migration being slowed by COVID-19.

Canada recorded its lowest natural

This was expected because of the overall aging of the p

by the impacts of the COVID-19 pandemic, with mor

While Canada has welcomed record numbers of permanent and temporary immigrants since 2015/2016, international migration growth decreased sharply from April 1 to June 30, 2020, following the border restrictions introduced as a result of the pandemic.

International migration

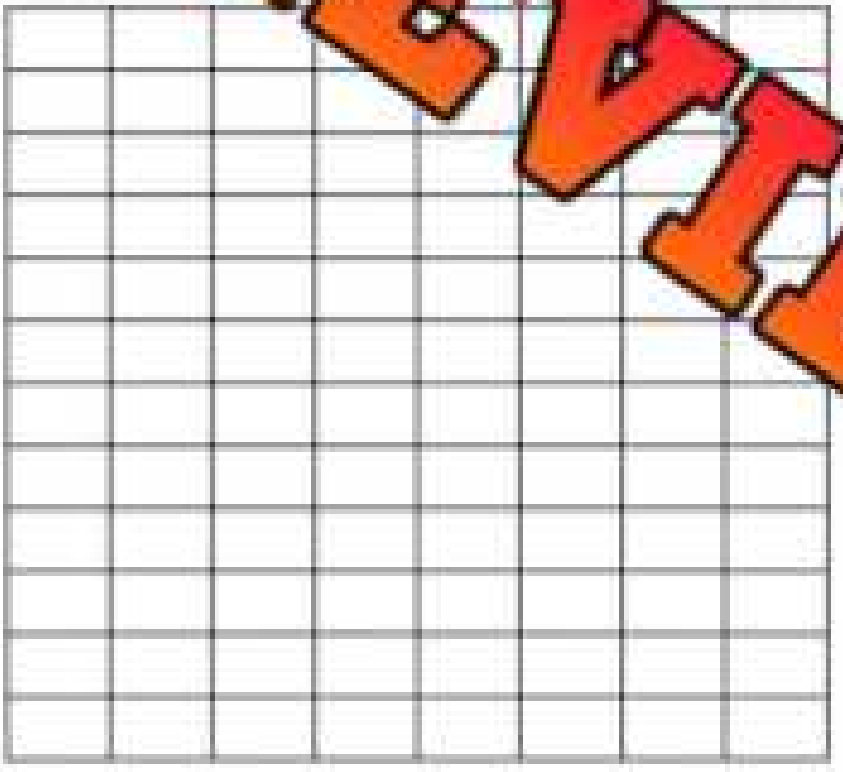
Name: _____ 95

Creating an Infographics

Directions Display the data set in different ways. Write in the boxes and draw pictures

Students in high school often have jobs outside of school. A study was done to determine if having a job led to better or worse grades. The number of hours a student worked, and their grades are represented in the table below.

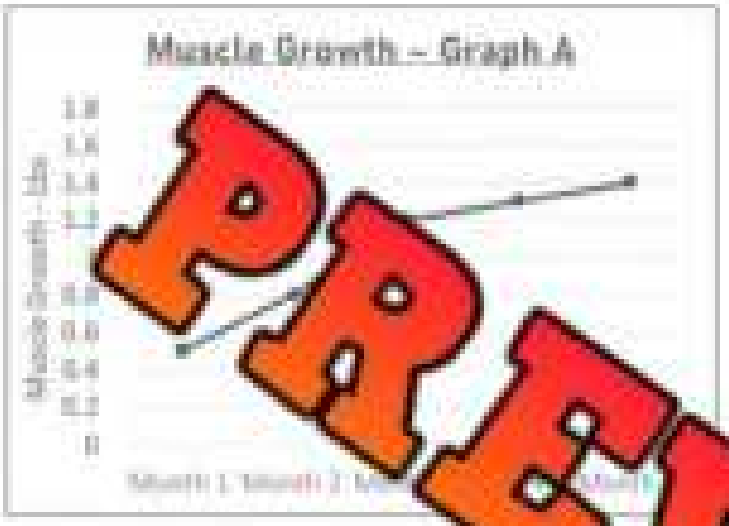
Hours W… (w…	3	2	1	4	3	6	7	5	6	4	5	6
A… Grade…	70	55	80	70	80	95	85	95	75	80	90	

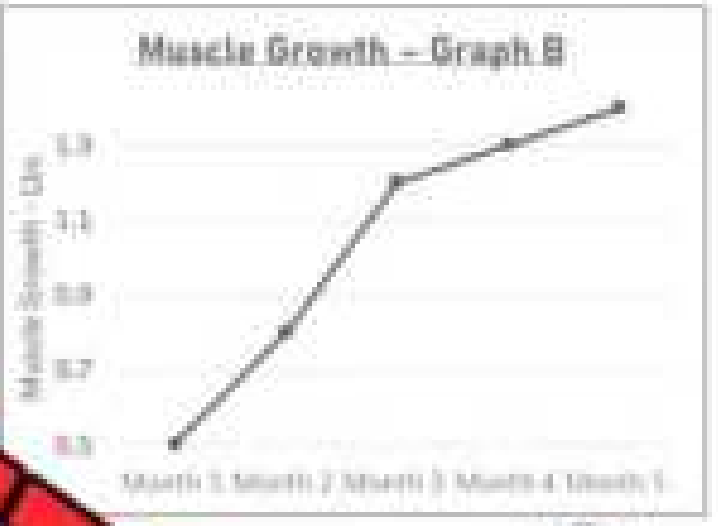


Name: _____ 99

Misleading Graphs

A supplement company that sells muscle-growth pills wants to share data they collected about the results of their pills. The users of their pills have gained muscle, which is what they want to show off. Their marketing team created 2 graphs. Which graph should they choose?





Questions What do you notice about these graphs?

a) Which graph would you use to show customers that your muscle-growth pills work really fast?

b) How are the graphs different? Do they have the same data?

c) How much muscle was gained in the 5 months?

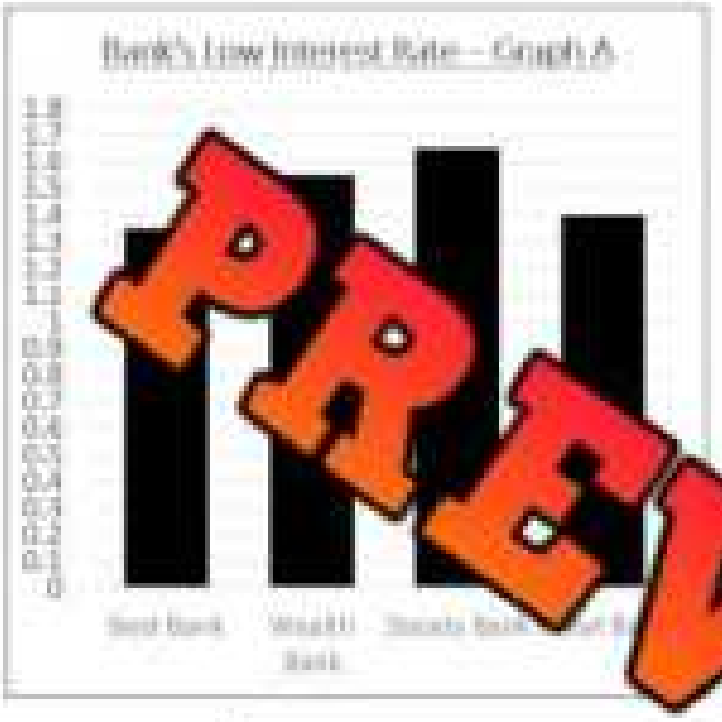
d) Does graph B make it seem like the users gained muscle quicker? Explain how they made it look this way.

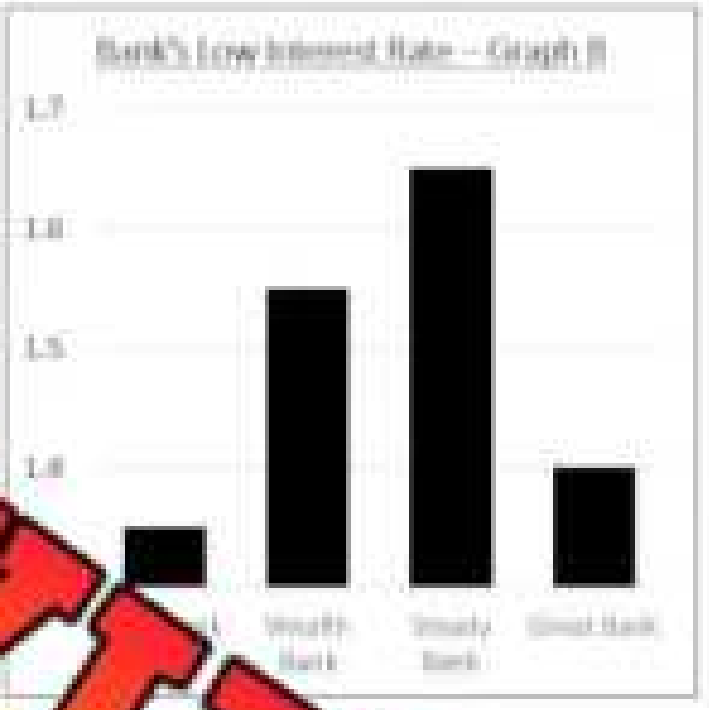
e) Why is it important to read a graph carefully?

Name: _____ 103

Misleading Graph – Bar Graph

Best Bank is advertising their low interest rate compared to 3 other bank's interest rates. They want to show their rate is by far the lowest. Which graph should they use?





Questions What do you notice about [illegible] graphs?

a) How are the graphs different? Do they have the same [illegible]

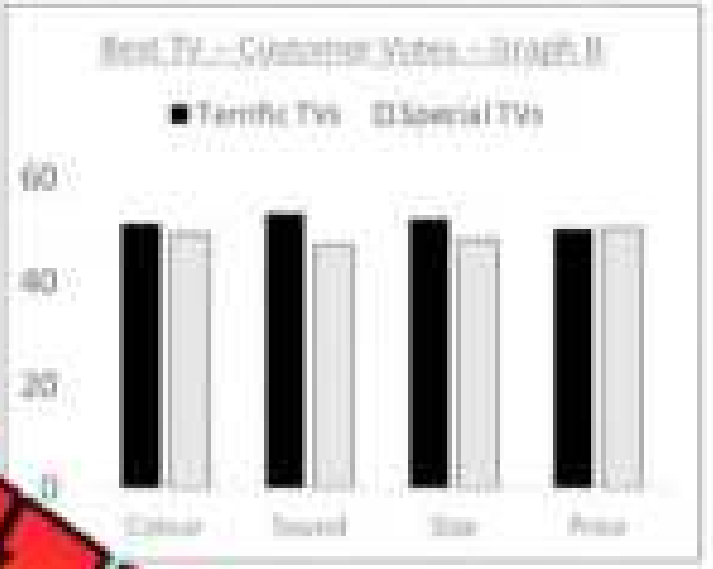
b) Which graph would you use if you were Best Bank? Explain.

c) Why would advertisers use misleading charts like this to sell their products?

Name: _____ 101

Misleading Graph – Multiple-Bar Graph

Terrific TVs sells televisions. Their biggest competition is a company named, Special TVs. Terrific TVs completed a study that compared the two brands. The results are below.



Questions What do you noti[illegible] the [illegible]?

a) Which graph would you use if you were T[illegible] TVs?

b) How many more votes in total did Terrific TVs get over Special T[illegible]

c) Is Terrific TVs a lot better than Special TVs? Explain.

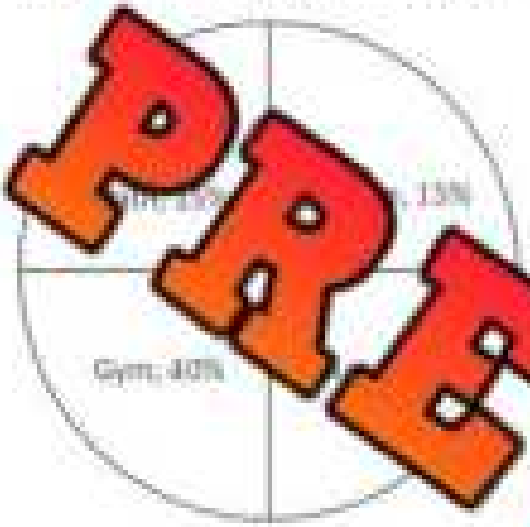
d) Do you think it is fair that businesses create misleading graphs like this one? Explain.

Name: _____ 102

Misleading Graph – Circle Graph

A Science and Technology school is trying to advertise that Science is a popular subject for students. A study that surveyed 100 students asking their favourite subject was completed. The results have been displayed in 2 graphs below.

Graph A - Most Popular Subjects



Graph B - Most Popular Subjects

Questions What do you notice about the two graphs?

a) Which of the two graphs is misleading? Explain why.

b) Which graph would you use if you were the science and technology school? Explain.

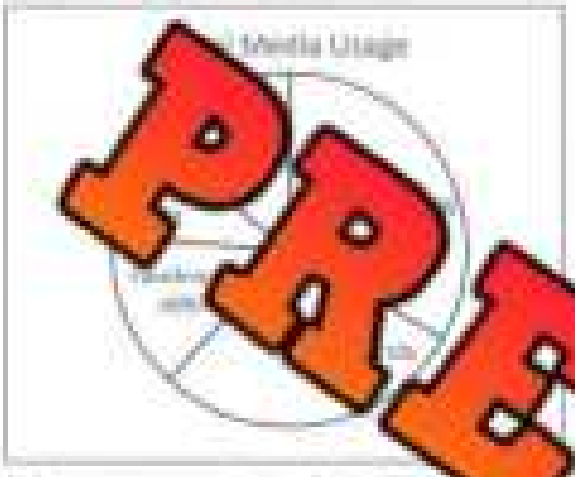
c) Do you think people would fall for this misleading graph? Explain your opinion.

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

A tech company conducted a survey to find out which social media platforms were the most popular. They asked 200 teenagers, aged 13–17. The results are displayed below.



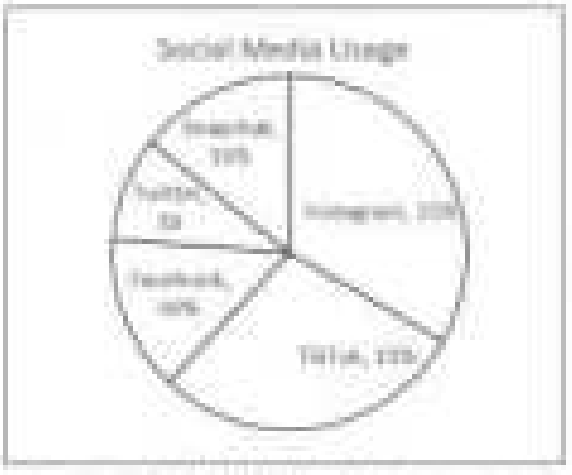
a) Why is this circle graph misleading?

b) Why is it important to look at the group being surveyed (teenagers) before trusting the data?

c) Can you trust all data? What are some ways companies can create misleading data through surveys?

Name: _____

A tech company conducted a survey to find out which social media platforms were the most popular. They asked 200 teenagers, aged 13–17. The results are displayed below.



a) Why is this circle graph misleading?

b) Why is it important to look at the group being surveyed (teenagers) before trusting the data?

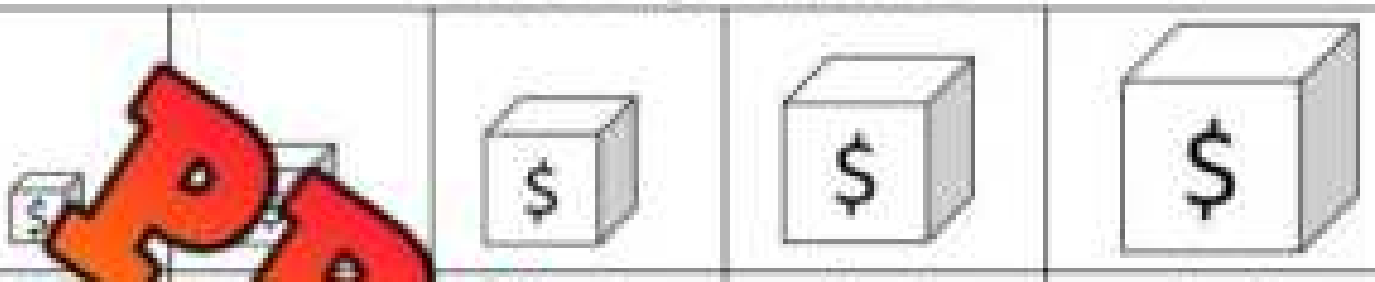
c) Can you trust all data? What are some ways companies can create misleading data through surveys?

Name: _____ 105

Misleading Pictograph – Company Earnings

Newco Software Company has been operating for the last 5 years. Their earnings each year have been represented in the pictograph below.

Newco's Earnings – Last 5 Years



Year 1	Year 2	Year 3	Year 4	Year 5
$15 405			$64 851	$81 235

Questions: What do you notice about the graph above?

a) How much more earnings did Newco make in Year 5 than Year 1?

b) What do you notice or wonder about the graph? Think of 3 things.

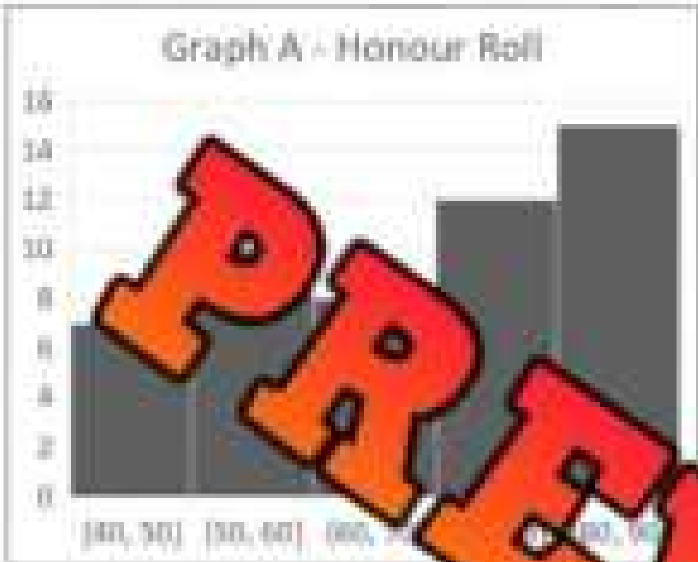
c) Why is the graph misleading? Hint: look at the size difference between Year 1 and Year 5. Remember your understanding of volume.

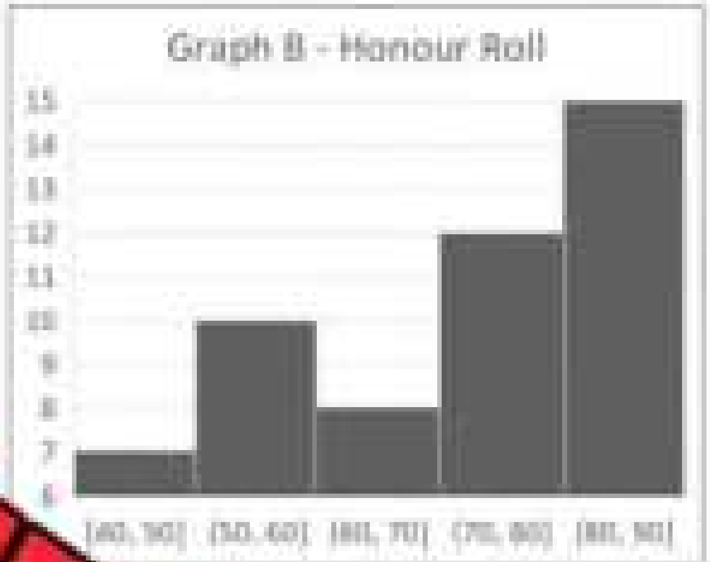
d) Approximately how many times larger is the Year 5 cube than the Year 1 cube?

Name: ______________________ 107

Misleading Graphs

Wellington High School is proud of how many students they have on their honour roll (80% or more). They want to show off their success by posting their data.





Questions What do you notice about the two graphs?

a) Which histogram should Wellington High School use if they want to emphasize their success?

____

____

b) How many more students were on the honour roll? ____________

c) How many did not make the honour roll? ____________

d) Would it be fair to use Graph B? Why or why not?

____

____

e) Make a connection – Have you ever seen an advertisement use a misleading graph?

____

____

Name: _____ 108

Truth or Lie? Graph Edition

Objective What are we learning about?

Students will learn to identify and explain misleading elements in graphs, developing critical thinking skills and understanding how data can be manipulated in visual representations.

Materials What you will need for the activity

- A [illegible] graphs (some accurate, some misleading)
- Smartboard [illegible] the graphs

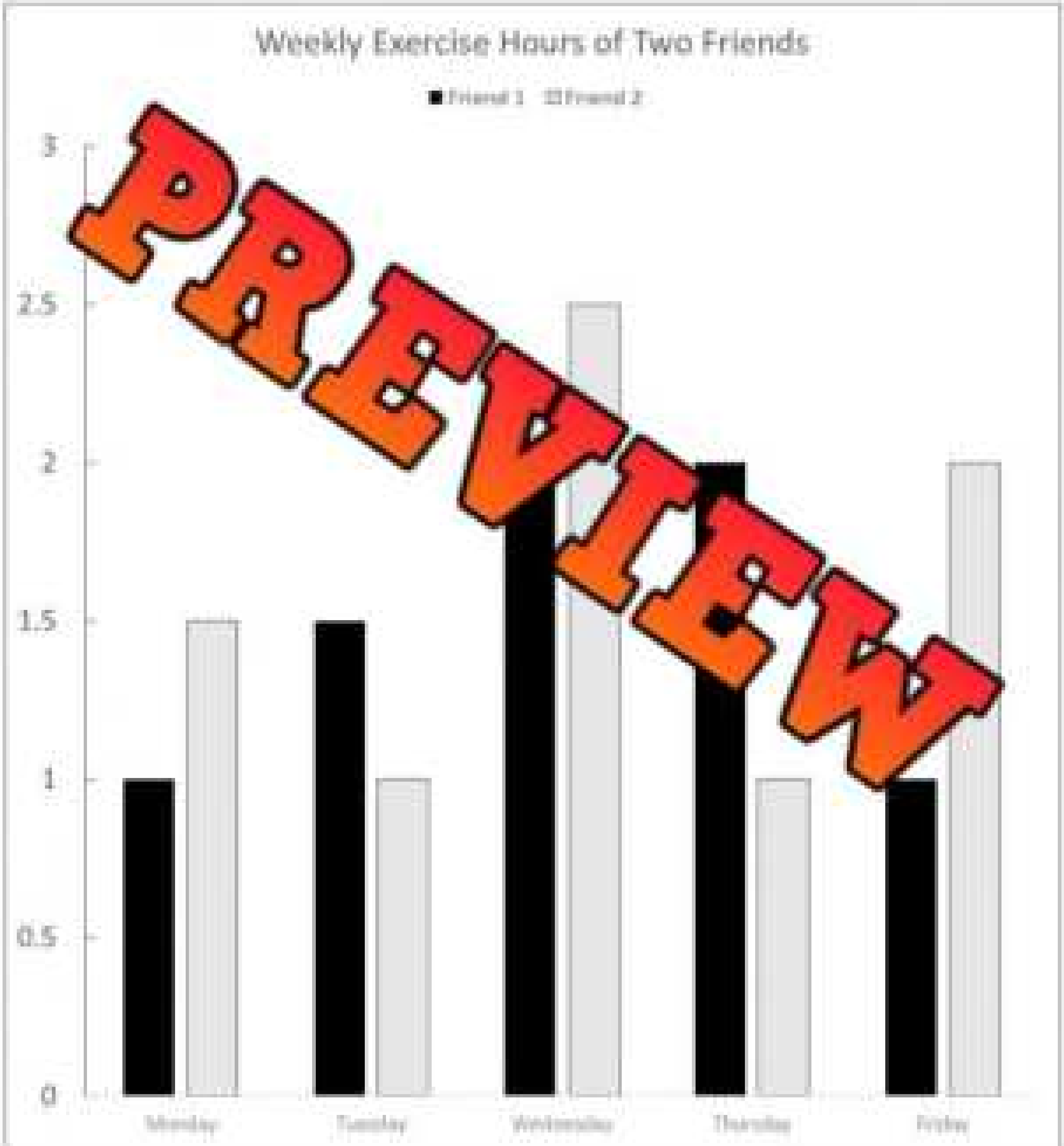
Instructions How [illegible] activity

1. Begin by explaining the concept of [illegible] graphs to the students, highlighting common ways graphs can be manipulated (e.g. [illegible] axes, omitting data, exaggerating differences).
2. Show each graph one at a time on the smart[illegible] ensure all students can see the graph clearly.
3. After showing each graph, ask the students to use fing[illegible] decision. They show one finger if they believe the graph is true (not misleading) and they show two fingers if they believe the graph is misleading in some way).
4. Once all students have made their decisions, invite a few students to explain their reasoning. Ask them to point out specific elements of the graph that make it true or misleading, such as the use of a misleading scale or omitted data.
5. Facilitate a class discussion to reinforce key concepts, summarizing the points made by the students and providing additional examples if necessary.
6. Repeat steps 3-5 for each graph in the set. Encourage students to look for new elements that might be misleading as they view different graphs.
7. After all graphs have been discussed, ask the students to reflect on what they have learned. Provide them with questions to think about or answer in their math journals or as a group.

Name: ____________________ 109

Graph | What do you notice about the graph?

Two friends, Alex and Jamie, tracked the hours they spent exercising from Monday to Friday. The graph compares their daily workout routines over the course of the week.



Name: _____ L10

Graph	What do you notice about the graph?

A local bakery recorded its monthly sales over the first half of the year. The graph illustrates the sales trends, aiming to show a rapid increase in income.

Name: ______________________ 111

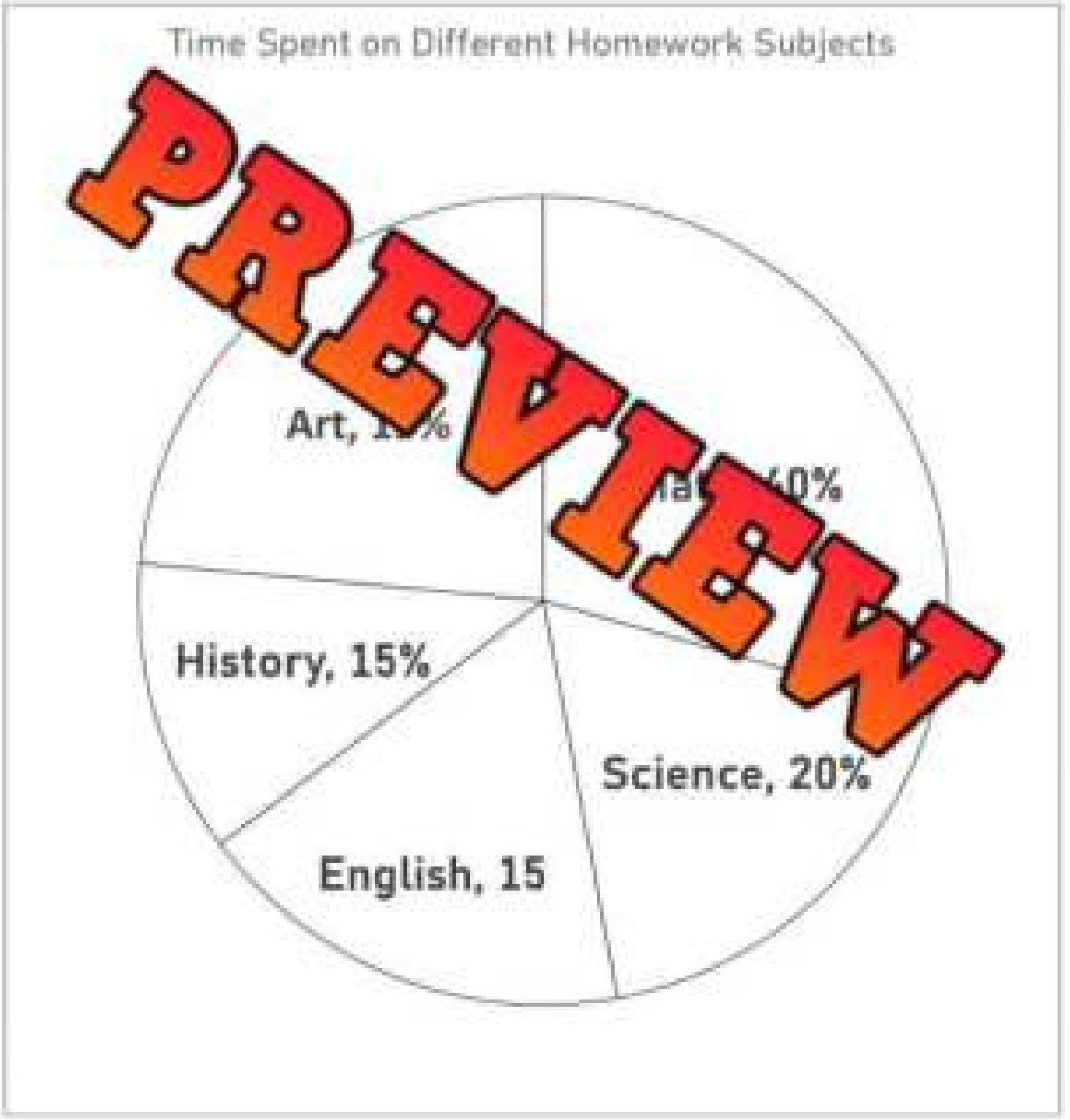
Graph | What do you notice about the graph?

Two households tracked their internet usage from January to May to monitor their data consumption. The graph displays how much data each household used each month.

Name: _____ 113

Graph	What do you notice about the graph?

A group of students tracked how much time they spent on different homework subjects—Math, Science, English, History, and Art. The circle graph displays how their time was divided between the subjects.



Name: ____________________ 114

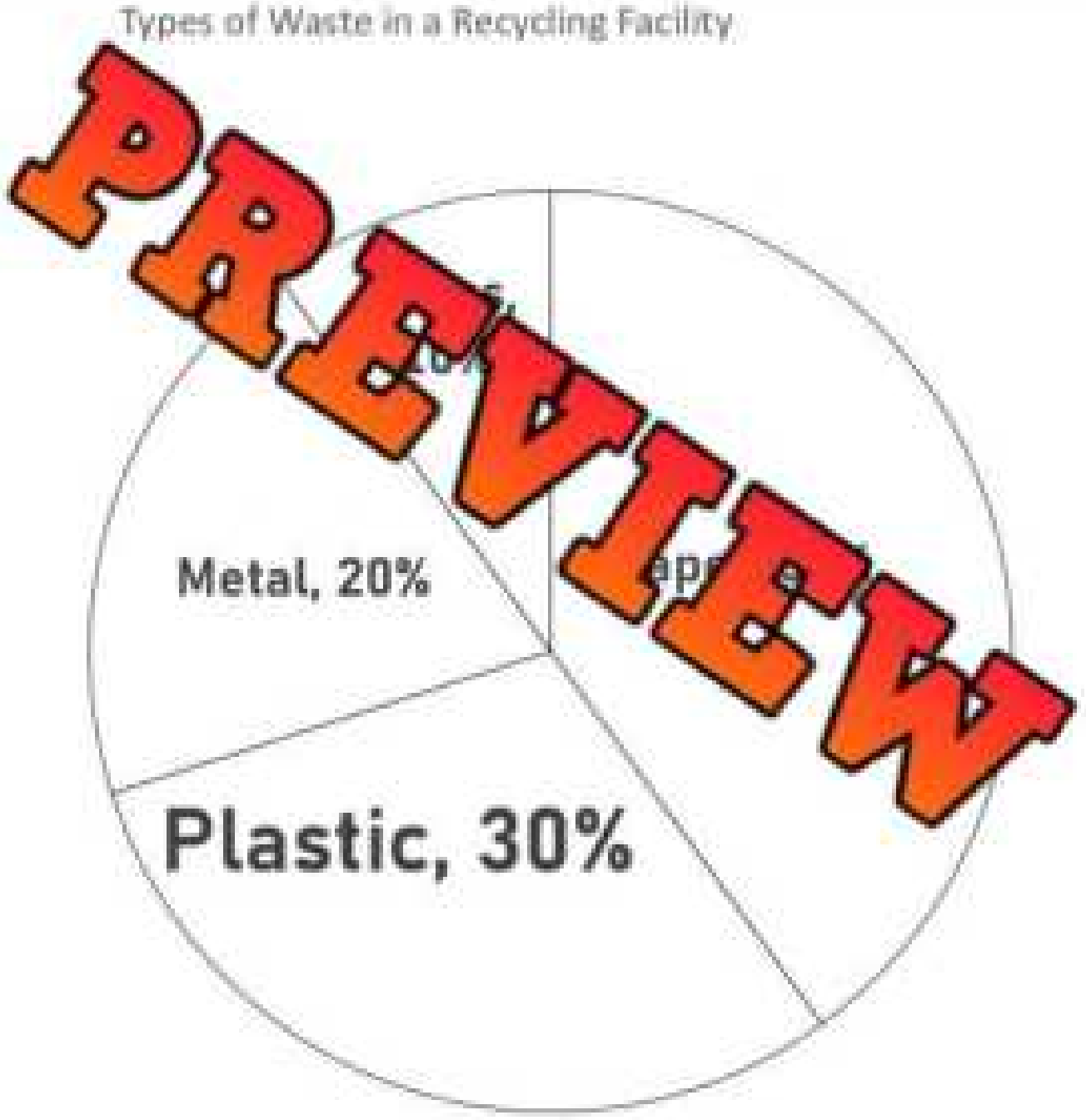
Graph | What do you notice about the graph?

The graph shows how temperatures fluctuated in a city over the course of a week, from Monday to Sunday.

Name: _____ L16

Graph | What do you notice about the graph?

A recycling facility is against the use of plastic for packaging, so they track the types of waste processed—paper, plastic, metal, and glass—and displayed them as a percentage of the total waste processed at their facility.



Name: _____ 117

Graph	What do you notice about the graph?

This graph compares the average salaries in two professions—Engineering and Marketing—over five years. The graph was made by professionals in the field of engineering and marketing who believe their incomes have not increased enough.

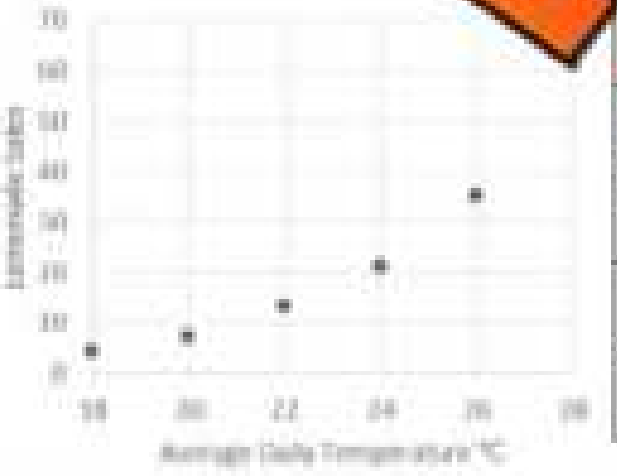
Name: _____ 119

Unit Test – Data Analysis

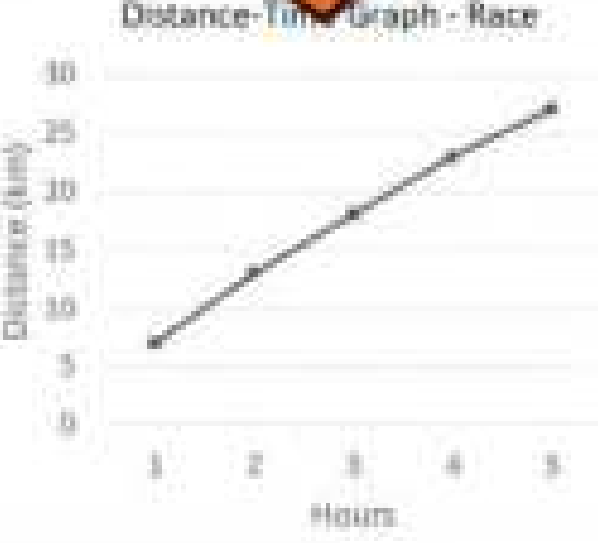
Part 1 Is the example one-variable or two-variable data? Use a checkmark ✓

	Example	One-Variable	Two-Variable
1)	Favourite subject in school		
2)	How many minutes studied and mark received on test		
3)	How [illegible]ons in attendance and how loud the arena is		
4)	How [illegible] player scores in a season		
5)	[illegible] piano and mistakes made [illegible] a son[illegible]		

Part 2 Does the graph represent one or two variables? Describe both variables



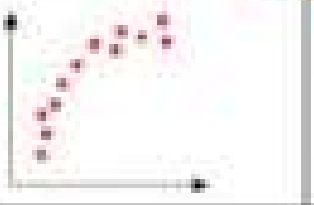
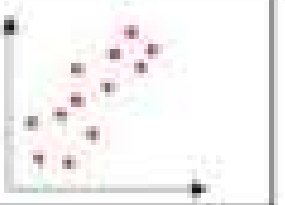
	Does the graph represent one or two variables?
1)	
	Describe variable number 1
2a)	
	Describe variable number 2 (if applicable)
2b)	



Part 3 Circle the graph you would use to represent the data

	Description	Graph A	Graph B
1)	You are displaying two sets of data from grade 7s and grade 8s	Multiple Bar Graph	Histogram
2)	You want to show the relationship between two variables	Histogram	Scatter Plot
3)	You want to graph continuous data	Broken-Line	Histogram
4)	You h[illegible]tegorical data and want to represent each [illegible] as parts of a whole	Broken Line Graph	Circle Graph
5)	[illegible] scores from students in [illegible] 70-80, 80-90 and 90-100	Broken-Line Graph	Histogram

Part 4 [illegible] between the variables

			
1)	2)		
			
5)	6)	7)	8)

Part 5 Describe what type of relationship the variables would have. Explain.

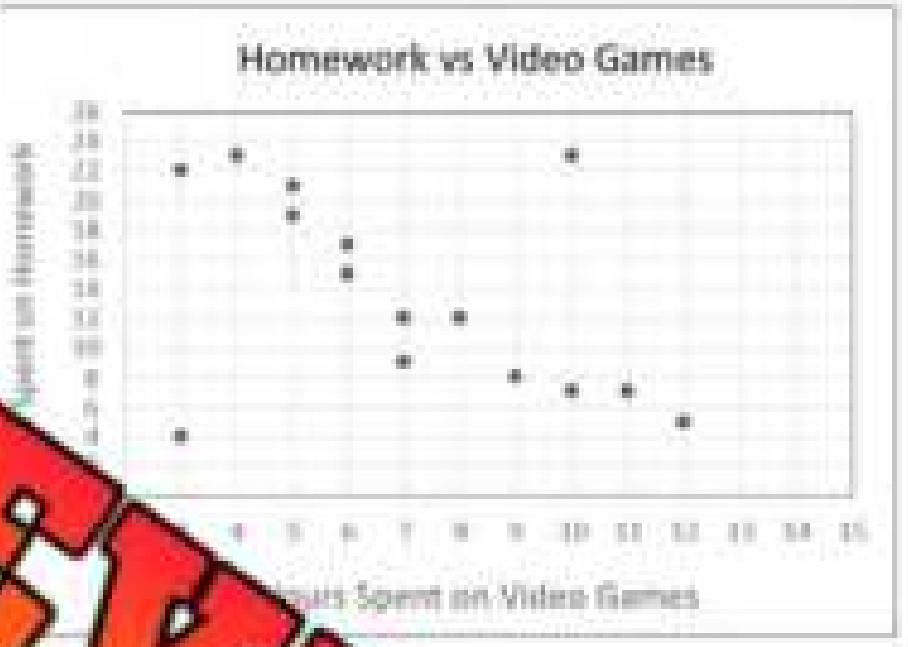
	Variable 1 (x-axis)	Variable 2 (y-axis)	Relationship
	Number of times you have been on an airplane	Fear of flying (scale from 1 – 10)	
Explain			

15 students were asked how many hours they spend on homework a week and how many hours they play video games a week. The results are displayed in the scatter plot below.

Part 6 Answer the questions below

Fill in the table of values by reading the scatter plot.

X-Value	Y-Values



1) [illegible] the data?

2) What [illegible]

3) What is the relationship between the variables?

4) How many students play more than 7 hours of games **and** do more than 7 hours of homework?

5) Draw a line of best fit. If someone played 14 hours of video games, how many hours of homework do you think they would do??

Part 7 Display the data below in a scatter-plot

Harris has an online business selling his artwork. He tracked how many views he had of his store and how many sales he had for the last 17 days.

Views	# of Sales
1	1
5	3
4	2
3	2
6	5
8	1
5	4
4	4
9	9
10	8
7	5
5	4
6	4
8	5
	5
	1
	3

Part 8 Answer the questions below

1) What outlier did you notice?	
2) What caused the outlier?	
3) Draw a line of best fit. How many sales would you expect if Harris had 12 views?	
4) What is the relationship between the variables?	

Grade 8
D2 Probability

	Curriculum Expectations	Pages That Cover the Expectations
D2.1	solve various problems that involve probability, using appropriate tools and strategies, including Venn and tree diagrams	127 – 138, 160 – 163
D2.2	determine and compare the theoretical and experimental probabilities of multiple independent events happening and of multiple dependent events happening	124 – 126, 139 – 159, 164 – 165

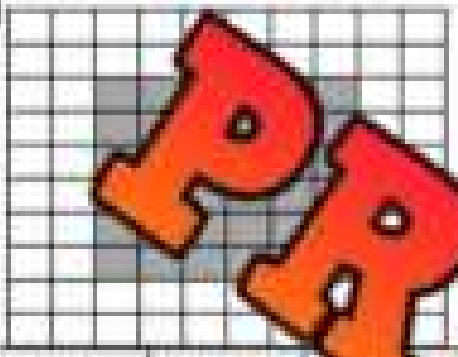
Name: _____ 12k

Independent Events – Darts

Independent events are two or more events that could happen at the same time without affecting the outcomes of the other events. Imagine below, that the shaded in area is a target and the white part is the wall. What is the probability of you hitting the target twice if you had two throws?

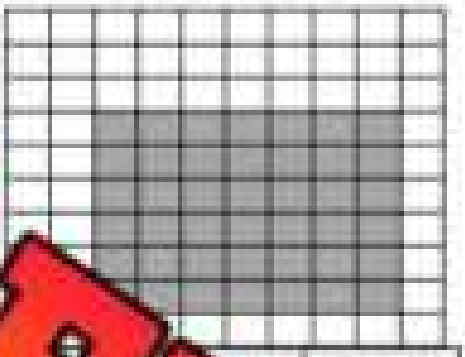
Questions What is the probability of you hitting the target twice if you had two throws?

1)



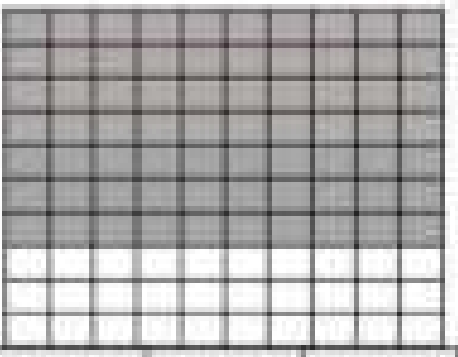
Fraction	Decimal	Percent

2)



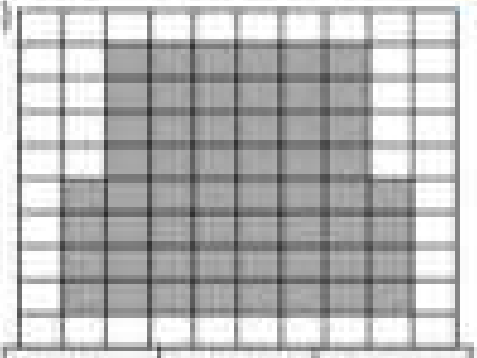
Fraction	Decimal	Percent

3)



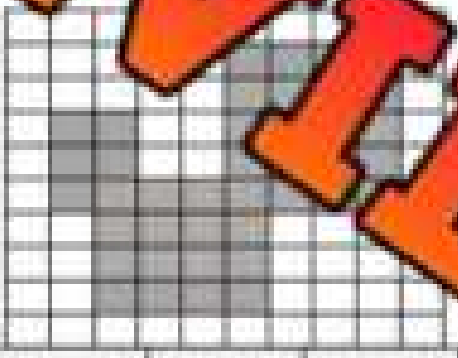
Fraction	Decimal	Percent

4)



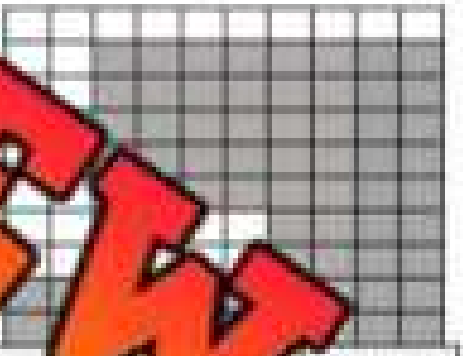
Fraction	Decimal	Percent

5)



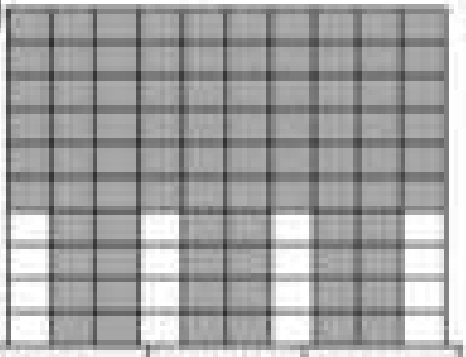
Fraction	Decimal	Percent

6)



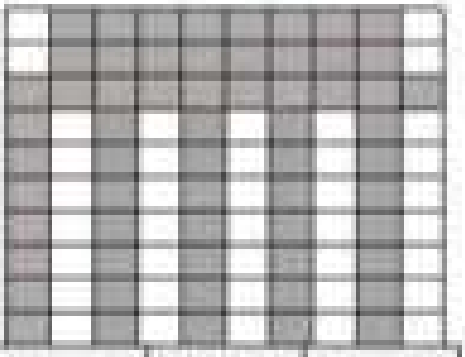
Fraction	Decimal	Percent

7)



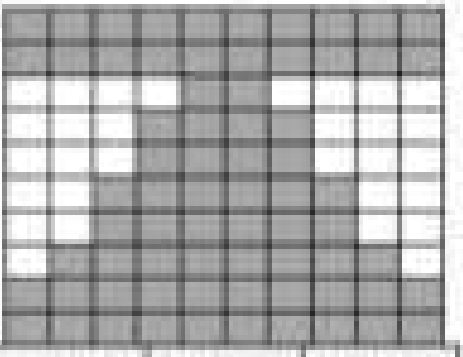
Fraction	Decimal	Percent

8)



Fraction	Decimal	Percent

9)

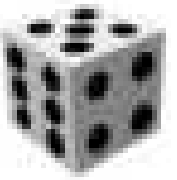


Fraction	Decimal	Percent

Name: _____ 12h

Independent Events – Rolling a Dice

Rolling a Dice
A dice has 6 sides. Each side has a number of dots between 1 and 6. When you roll a dice, you have an unlikely chance of rolling a certain number.



Questions	What is the probability of...

1) Rollin

	Decimal	Percent

2) Rolling a

	Decimal	Percent

3) Rolling an odd number?

Fraction	Decimal	Percent

4) Rolling two six-sided dice and getting two

Fraction	Decimal	Percent

5) Rolling two six-sided dice and getting a 1, 2, or 3 on both rolls?

Fraction	Decimal	Percent

6) Rolling two six-sided dice and getting an even number on both?

Fraction	Decimal	Percent

7) When rolling 2 dice, what is the probability of rolling a 1, 2, 3, 4, or 5 on both rolls?

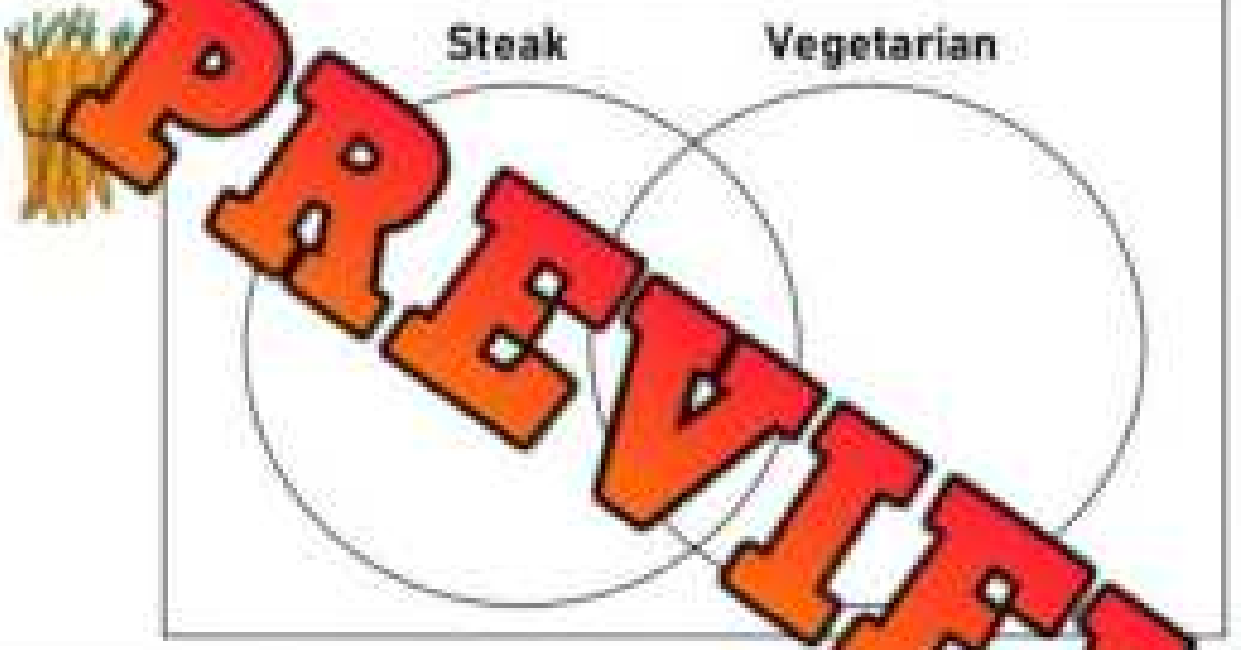
Fraction	Decimal	Percent

Name: _____ 127

Calculating Probability – Venn Diagram

At a wedding reception, the guests had 2 options for dinner – steak or vegetarian. Of the 50 guests at the reception, 30 are having steak, 20 are having vegetarian and 6 hungry guests are having both.

Part 1 Fill in the Venn diagram with the data above



Part 2 Answer the questions below

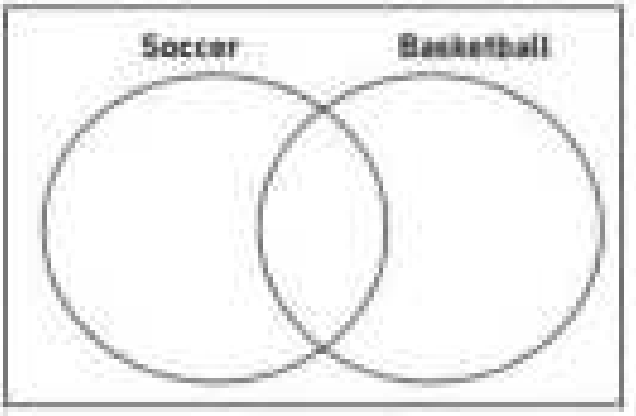
	Questions – What is the probability that a randomly selected guest...	Fraction	Dec	Percent
1)	ordered steak			
2)	ordered vegetarian			
3)	ordered steak or vegetarian but not both			
4)	ordered steak and vegetarian			
5)	didn't order a meal			
6)	ordered steak but not vegetarian			
7)	ordered vegetarian but not steak			

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

At a local sports event, participants had two options for activities – soccer or basketball. Out of the 60 participants, 35 are playing soccer, 25 are playing basketball, and 10 participants are playing both sports.



2) What is the probability that a randomly selected participant...	Fraction	Decimal	Percent
a) played soccer?			
b) played basketball?			
c) played soccer or basketball but not both?			
d) played both soccer and basketball?			
e) didn't participate in any activity?			

Name: _____

At a local sports event, participants had two options for activities – soccer or basketball. Out of the 60 participants, 35 are playing soccer, 25 are playing basketball, and 10 participants are playing both sports.

2) What is the probability that a randomly selected participant...	Fraction	Decimal	Percent
a) played soccer?			
b) played basketball?			
c) played soccer or basketball but not both?			
d) played both soccer and basketball?			
e) didn't participate in any activity?			

Name: _____ 12th

Calculating Probability – Venn Diagram

In a class of 30 students, 14 are wearing a sweater, 16 are wearing a t-shirt and 7 are wearing both.

Part 1 Fill in the Venn diagram with the data above

Part 2 Answer the questions below

What is the probability that a randomly selected student is wearing...		Fraction	Decimal	Percent
1)	a sweater			
2)	a sweater but not a t-shirt			
3)	a t-shirt			
4)	a t-shirt but not a sweater			
5)	neither a sweater nor a t-shirt			
6)	a sweater and a t-shirt			
7)	a sweater or a t-shirt but not both			

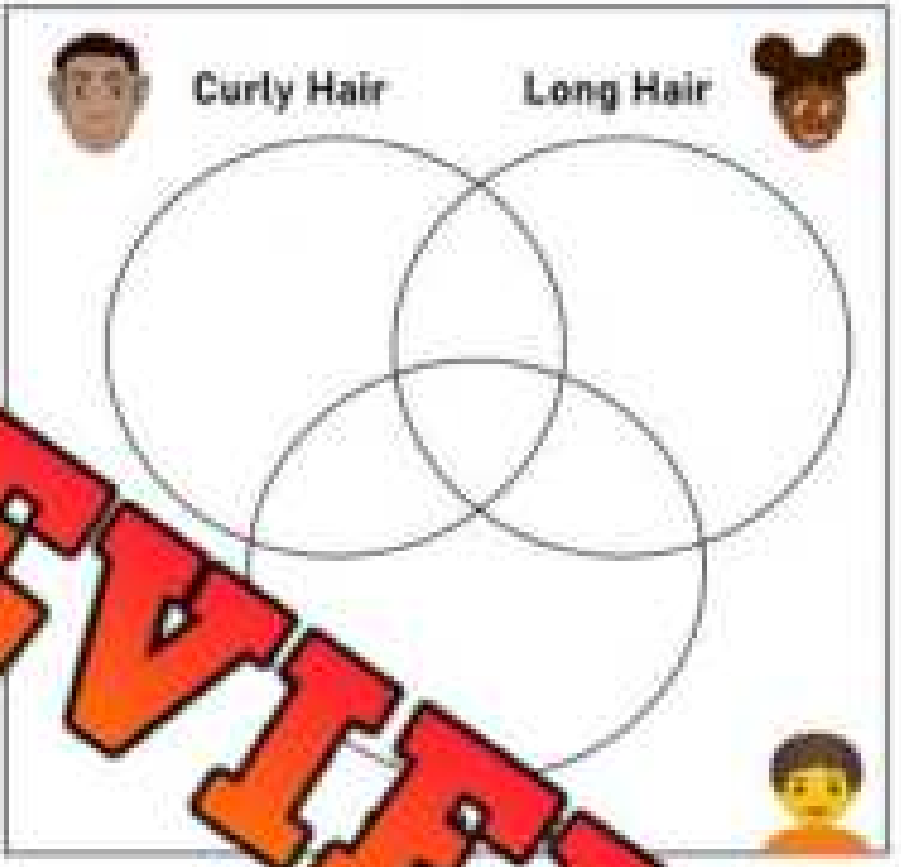
Name: _____ 130

Calculating Probability – Venn Diagram

Part 1 Fill in the Venn diagram with the data below

21 students were surveyed about their hair

Curly	Long	Short
Ella		Logan
Henry		Henry
Lu		
Sofia	Lily	
Nova	L	
Riley	Nova	
Julian	Julian	L
Nora	Nora	David
	Elena	Ben
	Owen	Eddie
	Violet	



Part 2 Answer the questions below

What is the probability that a randomly selected student...		Fraction	De	Percent
1)	has curly hair			
2)	has long hair			
3)	has short hair			
4)	does not have curly hair			
5)	has curly short hair			
6)	has curly long hair			
7)	has short hair that isn't curly			
8)	has long hair that isn't curly			

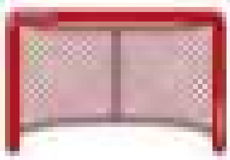
Name: ______________________________

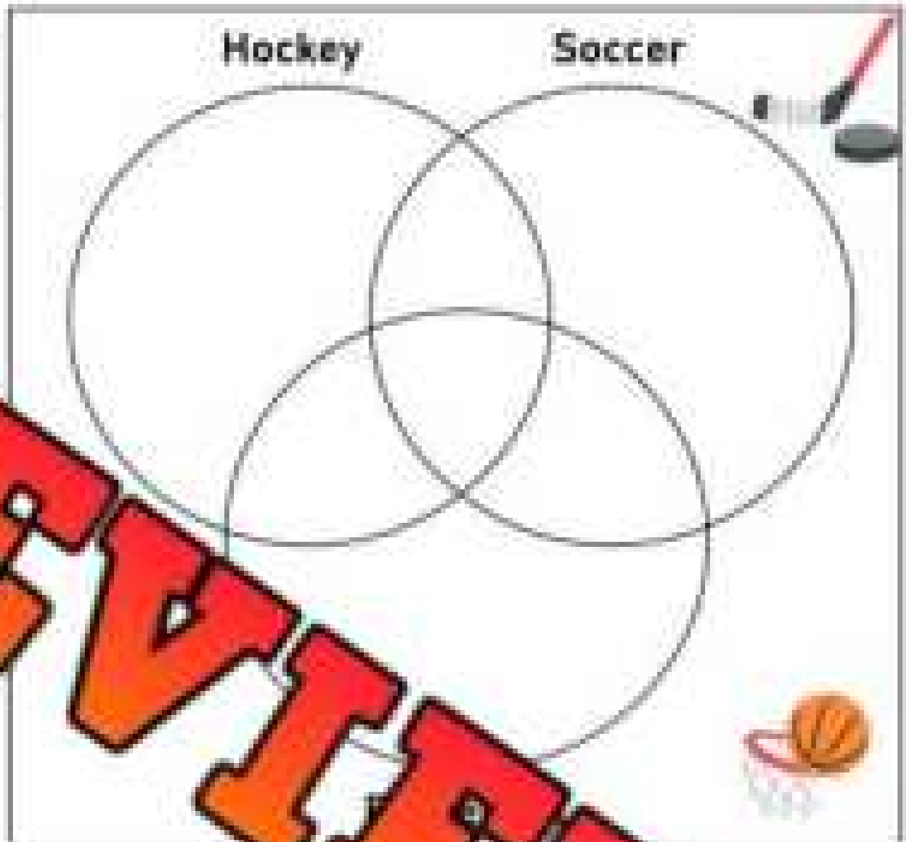
Calculating Probability – Venn Diagram

Part 1 Fill in the Venn diagram with the data above

100 people were surveyed about which sports they play

- 33 pl[illegible]etball
- 45 pl[illegible]
- 41 [illegible]
- [illegible]d so[illegible]
- 8 play bo[illegible] and hockey
- 9 play both so[illegible] basketball
- 6 play all three sports





Part 2 Answer the questions below

What is the probability that a randomly selected person…		Fraction	De[illegible]	Percent
1)	plays hockey			
2)	plays just hockey and not soccer or basketball			
3)	plays soccer			
4)	plays basketball and soccer but not hockey			
5)	plays basketball			
6)	plays all three sports			
7)	doesn't play hockey, soccer, nor basketball			
8)	plays hockey and soccer but not basketball			

Name: _____ 132

Calculating Probability – Venn Diagram

Questions | Answer the questions below using Venn diagrams

1) In a class of 24 students:
- 12 play the guitar
- 13 play the piano
- 5 play both the guitar and the piano

	What is the probability that a randomly selected student...	Percent
a)	plays the piano	
b)	plays just the guitar and not the	
c)	plays neither the guitar nor the piano	

2) In a company, there were 80 workers
- 50 workers like coffee
- 41 workers like tea
- 20 workers like both coffee and tea

	What is the probability that a randomly selected worker...	Percent
a)	likes coffee and tea	
b)	likes just tea and not coffee	
c)	likes neither coffee nor tea	

Name: _____ 133

Theoretical Probability of Two Events – Tree Diagrams

A tree diagram is used to show the probability of an outcome happening when we have more than one event

Combinations
HHH
HHT
HTH
HTT
THH
THT
TTH
TTT

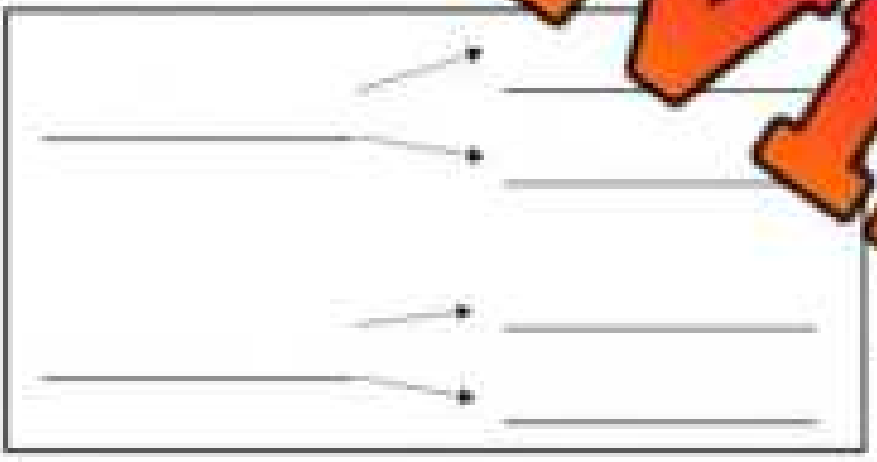
If you flip a coin three times, you could have 8 different combinations of outcomes.

HHH, HHT, HTH, HTT, THH, THT, TTH, TTT

This means you have a 1/8 probability of flipping three heads or tails in a row.

Questions: Dr... ...g ar... ...how many different combinations you could have

Rebecca was allowed to ... ...e drink at a Halloween party. The types of drinks and candy are li...



...inations

1) How many combinations could Rebecca have? _____

2) What is the probability she will choose...	Fraction	Decimal	Percent
a) chocolate and soda			
b) chocolate and juice			
c) gummies and soda			
d) gummies or chocolate and juice			

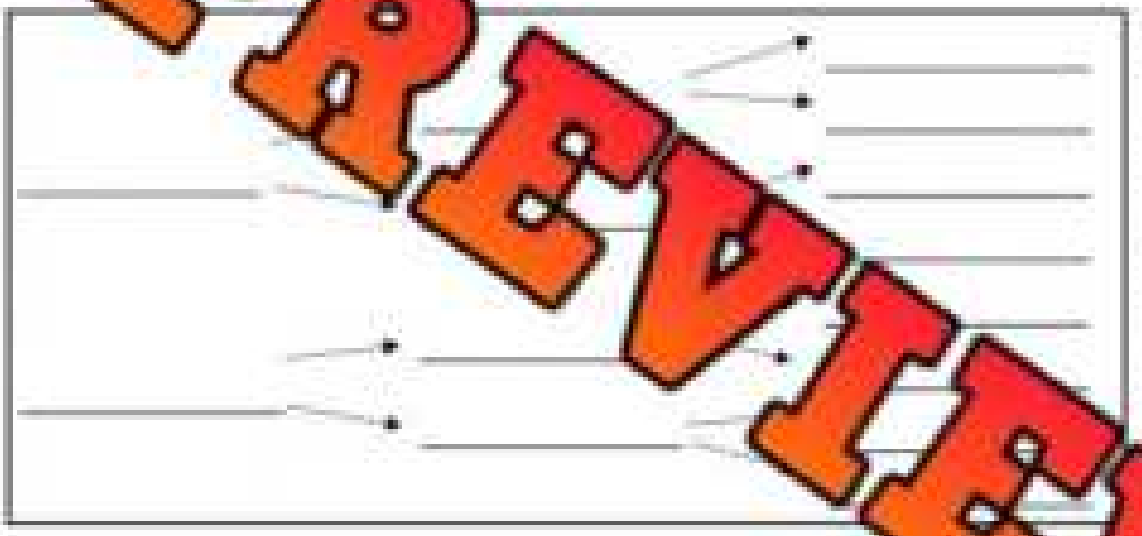
Name: _____ 13k

Tree Diagrams – Independent Events

Questions Draw a tree diagram to show how many different combinations you could have

An ice cream shop sells different cones, ice cream, and toppings. Their menu is listed below.

Cones	Ice Cream	Toppings
ar Cone (S)	Vanilla (V)	Butterscotch (B)
e (W)	Chocolate (C)	Fudge (F)



Combinations

1) How many combinations of ice cream could you have? _____

2) What is the probability of a customer ordering a..	Fraction	Decimal	Percent
a) sugar cone with vanilla ice cream and fudge			
b) sugar cone with chocolate ice cream and butterscotch			
c) waffle cone with chocolate or vanilla and fudge			
d) waffle or sugar cone with vanilla ice cream and fudge or butterscotch			
e) sugar cone with chocolate and fudge or butterscotch			
f) sugar or waffle cone with vanilla or chocolate ice cream and butterscotch or fudge toppings			

Name: _____ 13b

Drawing Tree Diagrams

Questions Draw a tree diagram to help you find the probability of different combinations

You are having a surprise dessert at a party you are having. Your parents said it is either cookies or brownies. They also told you the options for the treats and icing. What is the probability of them choosing a specific combination of baked good, treat, and icing.

Baked Goods	Treats	Icing
Cookies (C)	Chocolate Chips (CC)	Vanilla (V)
Brownies (B)	Smarties (S)	Chocolate (CH)
	Raisins (R)	Caramel (CA)

1) How many combinations of food could you have? _____

2) What is the probability of your parents choosing...	Fraction	Decimal	Percent
a) Cookies with chocolate chips and vanilla icing			
b) Brownies with raisins and caramel icing			
c) Cookies or brownies with smarties and vanilla icing			
d) Cookies or brownies with raisins or smarties and vanilla or chocolate icing			
e) Cookies with chocolate chips, smarties or raisins and vanilla or caramel icing			

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Draw a tree diagram to help you find the probability of different combinations.

You are designing an avatar, and you have the following options for customizing its outfit. You can choose one shirt colour, one pants type, and one shoe type for the avatar.

Shirt Colour	Pants Type	Shoe Type
Red (R)	Jeans (J)	Sneakers (SN)
Blue (B)	Shorts (S)	Boots (BO)
Green (G)		

Name: _____

Draw a tree diagram to help you find the probability of different combinations.

You are designing an avatar, and you have the following options for customizing its outfit. You can choose one shirt colour, one pants type, and one shoe type for the avatar.

Shirt Colour	Pants Type	Shoe Type
Red (R)	Jeans (J)	Sneakers (SN)
Blue (B)	Shorts (S)	Boots (BO)
Green (G)		

Name: _____ 138

Determining Probability of Multiple Events

Questions | Solve each problem

1) A customer walks in Premiere Pizza where you can order one type of pizza and a drink for $6. The menu is below.

Pizza	Drink
[illegible]pperoni	Soda
[illegible]on	Juice
[illegible]con	Milk

a) How many combinations could the customer order?

b) What is the probability the customer orders bacon pizza with juice?

c) What is the probability the customer orders onion or pepperoni pizza with juice or soda?

2) Your teacher teaches 3 classes in the morning. The options for each class are below.

Class 1	Class 2	Class 3
Math	Music	Social Studies
Language	French	Science
Health	Drama	Gym

a) How many combinations could your teacher choose?

b) What is the probability your teacher chooses math, music or drama, and gym?

c) What is the probability your teacher [illegible], drama or French, and science or [illegible]

3) At a fancy restaurant, you can order a surprise dinner. They tell you the options for the meat, vegetables, and dessert.

Meat	Vegetables	Dessert
Chicken	Potatoes	Cake
Steak	Salad	Brownie
Fish	Corn	

a) How many combinations could the chef make?

b) What is the probability the chef makes steak or chicken with potatoes and cake?

c) What is the probability the chef makes chicken or fish with corn or salad and brownie?

4) [illegible] you with your [illegible] below.

Top	[illegible]		
Shirt	Jeans	[illegible]	[illegible]
Sweater	Shorts	[illegible]	Cap
Jersey	Jogs		

a) How many combinations could your mom pick?

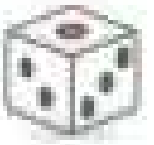
b) What is the probability your mom picks a shirt with pants and shoes and a cap?

c) What is the probability your mom picks a jersey or shirt with jogs and sandals or shoes with a toque?

Name: _____ 139

Independent Events – Dice Challenge

Part 1 Find the probability of each sum when two dice are rolled



1) What is the probability of you rolling two six-sided dice and getting a sum of the two dice greater than 7?

2) What is the probability of you rolling two six-sided dice and getting a sum of the two dice greater than 10?

3) What is the probability of you rolling two six-sided dice and getting a sum of the two dice less than 4?

+	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						

Part 2 Find the probability of each product when two dice are rolled

×	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						

1) What is the probability of you rolling two six-sided dice and getting a product of the two dice greater than 15?

2) What is the probability of you rolling two six-sided dice and getting a product of the two dice less than or equal to 15?

3) What is the probability of you rolling two six-sided dice and getting a product of the two dice greater than or equal to 24?

Name: _____ 140

Independent vs Dependent Events

Two events are **independent events** if the outcome of one event does not affect the outcome of the other. Example - flipping a coin twice or rolling a dice and flipping a coin.

Two events are **dependent events** if the outcome of one event affects the outcome of the other. Example – drawing names from a hat (the number of names decreases after each draw, which affects the probability of the next event(s).

Questions re the events independent or dependent?

1)	om a box of different	Dependent	Independent
2)	Perform on a landing on 300 points both	Dependent	Independent
3)	Snowing today and no	Dependent	Independent
4)	Randomly selecting two t-shirts that is full of multi-coloured sh	Dependent	Independent
5)	A teacher hands out candy from their bi rent types of candy		Independent
6)	Making 5 three pointers in a row		ndent
7)	Your teacher is selecting 2 students to help them. You hope you and your best friend get chosen.	Dep	ndent
8)	Drawing a heart from a deck of cards and then drawing another heart from the same deck of cards	Dependent	Independent
9)	Drawing an 8 from a deck of cards and then drawing an 8 from a different deck of cards	Dependent	Independent
10)	You winning 3 hockey games in a row	Dependent	Independent
11)	Winning today's race and next week's race	Dependent	Independent
12)	Flip a coin and select a card from a deck of cards	Dependent	Independent

Name: _____ 141

Dependent Events – Money Bag

A bag has one of each Canadian coins - 5¢, 10¢, 25¢, $1, $2.

What is the probability you will select a dime and then a quarter?

Solution

Probability to pick a Dime is 1/5

Probability to pick a Quarter is 1/4 (no dime in the bag)

Desired probability $= \frac{1}{5} \times \frac{1}{4} = \frac{1}{20}$

Question: What is the probability of the following scenarios:

	Scenario – Probability	Answer – Show Your Work
1)	Selecting a Toonie?	
2)	Selecting a Quarter and then a Loonie	
3)	Selecting a Nickel and then a Dime, and then a Loonie?	
4)	Selecting a Toonie, and then a Loonie, and then a Nickel?	
5)	Selecting the following coins in the order presented: Nickel, Quarter, Toonie, Dime?	
6)	Selecting the following coins in the order presented: Nickel, Dime, Quarter, Loonie, Toonie?	

Name: _____ 142

Dependent Events – Prize Box

Question: Determine the probability of the following scenarios

	Scenario	Answer – Show Your Work
1)	You get one pick. What is the likelihood of picking a basketball?	
2)	You get two picks. What is the likelihood of picking a set of headphones first and a pencil second?	
3)	You get three picks. What is the likelihood of picking a baseball first, a pencil second, and a phone third?	
4)	You get four picks. What is the likelihood of picking a phone first, a basketball second, headphones third, and a hairbrush fourth?	
5)	You are picking from the prize box third. One phone and one set of headphones are already gone. What is the likelihood of you picking a phone?	
6)	You are picking from the prize box fifth. One phone, one hairbrush, and two baseballs are already gone. You get two picks. What is the likelihood of you picking a phone first and then headphones second?	

Name: _____ 143

Theoretical vs Experimental Probability

Theoretical Probability
What should happen

Example – The theoretical probability of flipping a heads is 1 time out of 2 or ½.

Experiment Probability
What did happen after the event (experiment)

Example – You flipped a coin 10 times and got 7 heads. The experimental probability is 7/10.

Part 1 — Write the theoretical probability of the events happening below

Question	Fraction	Decimal	Percent
1) W… …obability of flipping a heads?			
2) Wh… …e th… …bability of flipping a tails?			
3) What is the… …robability of flipping a heads if you flipped the c… …mes?			
4) What is the theoreti… …y of … heads and then rolling a dice an… …7?			
5) What is the theoretical probab… …y of … getting an odd number and then flippi…			

Part 2 — Experimental Probability – Flip a … …d tim… …rd your results

1) How many heads and tails do you think you will flip … Tails

20

2) Perform the experiment by flipping a coin 20 times. Record how many h… …d tails you get.

	Tallies	Frequency	Fraction	Decimal	Percent
Heads					
Tails					

3) Was the theoretical probability and experimental probability the same? Should it be the same? Explain.

_____

_____

Name: _____ 144

Theoretical vs Experimental Probability

Examples of Theoretical and Experimental Probability
Theoretical: You should roll a 3 once every 6 rolls = 1/6
Experimental: You rolled a 3 twice when you rolled a dice six times = 2/6

Part 1 — Circle if the example is theoretical or experimental

Example	Theoretical	Experimental
1) There [illegible] of rain today	Theoretical	Experimental
2) Y[illegible] and got heads 3 times	Theoretical	Experimental
3) You ha[illegible] heart from a deck of cards	Theoretical	Experimental
4) A scratch ca[illegible] of winning a prize	Theoretical	Experimental
5) Your batting aver[illegible] a hit 1 in 4	Theoretical	Experimental
6) You made 4 of 10 three p[illegible]	Theoretical	Experimental
7) Seabiscuit won the race even th[illegible]	Theoretical	Experimental
8) The Toronto Raptors won 4/7 games[illegible]	Theoretical	Experimental
9) You have a 1/90 chance of winning a giveawa[illegible]	Theoretical	Experimental
10) You won a cross-country race with 90 people [illegible]	Theoretical	Experimental

Part 2 — Is the example theoretical or experimental? What is the probability?

Example	Theoretical or Experimental	Fraction	Decimal	Percent
1) You should make 8 in 10 free throws				
2) You buy one raffle ticket out of 90 that are sold.				
3) You rolled a dice 10 times and got a 3, 4 times.				
4) You pulled 20 cards from a deck of cards and got 5 red ones.				
5) There is a 35% chance of precipitation				

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Answer the following questions.

1) You roll a fair die, and based on theory, each number should appear once every 6 rolls = 1/6.

Circle Answer: Theoretical or Experimental

2) A bag contains 5 blue marbles and 5 red marbles. You picked 5 blue marbles out of 9 picks from the bag.

Circle Answer: Theoretical or Experimental

3) Fill the table

Example	Theoretical or Experimental	Fraction	Decimal	Percent
The probability of selecting an ace from a deck of cards is 4/52				

Name: _____

Answer the following questions.

1) You roll a fair die, and based on theory, each number should appear once every 6 rolls = 1/6.

Circle Answer: Theoretical or Experimental

2) A bag contains 5 blue marbles and 5 red marbles. You picked 5 blue marbles out of 9 picks from the bag.

Circle Answer: Theoretical or Experimental

3) Fill the table

Example	Theoretical or Experimental	Fraction	Decimal	Percent
The probability of selecting an ace from a deck of cards is 4/52				

Name: _____

Answer the following questions.

1) You roll a fair die, and based on theory, each number should appear once every 6 rolls = 1/6.

Circle Answer: Theoretical or Experimental

2) A bag contains 5 blue marbles and 5 red marbles. You picked 5 blue marbles out of 9 picks from the bag.

Circle Answer: Theoretical or Experimental

3) Fill the table

Example	Theoretical or Experimental	Fraction	Decimal	Percent
The probability of selecting an ace from a deck of cards is 4/52				

Name: _____ 146

Activity – Math Hot Seat: Probability Showdown

Objective What are we learning about?

Students will practice differentiating between theoretical and experimental probability by participating in a fun and interactive game, enhancing their ability to understand probability concepts.

Materials ou will need for the activity

- Index cards with probability questions (theoretical and experimental)
- Chairs arranged in a circle
- Stopwatch or timer
- Whiteboard and markers

Instructions How you will implement the activity

1. Prepare a stack of index cards with various probability questions. Ensure some questions ask students to identify theoretical probabilities and others to calculate experimental probability.
2. Arrange chairs in a circle with one "hot seat" in the center.
3. Explain the rules of the game to the students. One student will sit in the hot seat while the rest sit in the surrounding chairs.
4. The teacher will read a probability question from the stack. The student in the hot seat has a limited time (e.g., 30 seconds) to answer the question.
5. If the student in the hot seat answers correctly within the time limit, they stay in the hot seat for the next round. If they answer incorrectly or run out of time, they switch places with another student from the circle.
6. Continue the game until each student has had the opportunity to sit in the hot seat multiple times, or until the designated game time is up.
7. Keep track of the number of correct answers each student provides while in the hot seat. The student with the most correct answers at the end of the game wins.

Name: _____ 147

Index Cards | Use the math problems below

#	Probability Question	Answer
1	A coin is flipped 50 times and lands on heads 22 times. What is the experimental probability of heads as a percent?	44%
2	A die is rolled 10 times, and it lands on a 5 two times. What is the experimental probability of rolling a 5 as a percent?	20%
3	A deck of cards is shuffled, and one card is drawn. What is the theoretical probability of drawing a red card as a percent?	50%
4	A jar [illegible] 25 marbles, and 7 are red. What is the probability of ran[illegible] red marble as a fraction?	7/25
5	[illegible]s and lands on green 6 times. What is the [illegible] landing on green as a fraction?	6/20 or 3/10
6	What is th[illegible] of rolling a 6 on a standard die? Provide your answ[illegible]	1/6
7	A bag has 10 [illegible] 10 [illegible] the probability of drawing a red ball as a perc[illegible]	50%
8	In 25 coin flips, 14 land [illegible] experimental probability of tails as a fraction?	14/25
9	A die is rolled 5 times, and it lands o[illegible] Wh[illegible] experimental probability of rolling a 3 as a percen[illegible]	20%
10	A jar has 50 candies, and 12 are blue. What is [illegible] probability of drawing a blue candy as a percent?	24%
11	What is the theoretical probability of drawing an Ace from a standard deck of cards? Provide your answer as a fraction.	4/52 or 1/13
12	A spinner is divided into 4 equal sections. What is the theoretical probability of landing on one section as a percent?	
13	A die is rolled 20 times and lands on an even number 8 times. What is the experimental probability of rolling an even number as a fraction?	8/20 or 2/5
14	A jar has 30 marbles, and 6 are green. What is the probability of picking a green marble as a fraction?	6/30 or 1/5
15	What is the theoretical probability of flipping a coin and getting heads? Provide your answer as a percent.	50%
16	In a jar of 20 candies, 8 are red. What is the probability of picking a red candy as a percent?	40%
17	A spinner is spun 50 times and lands on red 18 times. What is the experimental probability of landing on red as a fraction?	18/50 or 9/25
18	What is the theoretical probability of rolling a number greater than 4 on a die? Provide your answer as a fraction.	2/6 or 1/3

Name: _____ 148

Index Cards | Use the math problems below

#	Probability Question	Answer
19	A deck of cards has 52 cards. What is the theoretical probability of drawing a black card as a percent?	50%
20	A die is rolled 25 times and lands on a 2 six times. What is the experimental probability of rolling a 2 as a percent?	24%
21	A coin is flipped 10 times and lands on tails 7 times. What is the experimental probability of tails as a fraction?	7/10
22	What is the theoretical probability of drawing a heart from a standard deck of cards? Provide your answer as a percent.	25%
23	A bag contains 15 marbles: 5 red, 5 blue, and 5 yellow. What is the probability of drawing a blue marble as a percent?	33.33%
24	A coin is flipped 40 times and lands on heads 22 times. What is the experimental probability of heads as a fraction?	22/40 or 11/20
25	A die is rolled 20 times and lands on a 6 each time. What is the experimental probability of rolling a 6 as a percent?	100%
26	What is the theoretical probability of rolling an even number on a die? Provide your answer as a fraction.	3/6 or 1/2
27	In 20 flips of a coin, 8 land on tails. What is the experimental probability of tails as a percent?	40%
28	A jar contains 10 marbles. 3 are blue. What is the probability of picking a blue marble as a percent?	30%
29	A spinner has 8 equal sections, and it is spun 20 times. It lands on red 5 times. What is the experimental probability of landing on red as a fraction?	1/20
30	What is the theoretical probability of drawing a King from a standard deck of cards? Provide your answer as a fraction.	1/13
31	A die is rolled 6 times, and it lands on a 4 two times. What is the experimental probability of rolling a 4 as a fraction?	2/6 or 1/3
32	In a bag of 25 candies, 9 are red. What is the probability of picking a red candy as a fraction?	9/25
33	A coin is flipped 15 times and lands on heads 6 times. What is the experimental probability of heads as a fraction?	6/15 or 2/5
34	A jar has 50 marbles. 18 are blue. What is the probability of picking a blue marble as a percent?	36%
35	What is the theoretical probability of rolling a number less than 3 on a die? Provide your answer as a fraction.	2/6 or 1/3
36	A spinner has 6 equal sections. What is the theoretical probability of landing on one section as a fraction?	1/6

Name: _____ 1/49

Index Cards | Use the math problems below

#	Probability Question	Answer
37	A die is rolled 12 times and lands on a 5 four times. What is the experimental probability of rolling a 5 as a fraction?	4/12 or 1/3
38	A jar contains 20 candies, and 8 are yellow. What is the probability of picking a yellow candy as a percent?	40%
39	A spinner is spun 30 times and lands on blue 12 times. What is the experimental probability of landing on blue as a fraction?	12/30 or 2/5
40	What is the theoretical probability of drawing a face card from a standard deck of cards? Provide your answer as a fraction.	12/52
41	In 10 rolls of a die, it lands on the number 4 times. What is the experimental probability of rolling the number as a fraction?	4/10 or 2/5
42	A coin is flipped 5 times and lands on heads 3 times. What is the experimental probability of flipping a heads?	3/5
43	A jar has 10 marbles, and 3 are green. What is the probability of picking a green marble as a percent?	30%
44	A spinner is spun 25 times and lands on yellow 8 times. What is the experimental probability of landing on yellow as a fraction?	8/25
45	A deck of cards has 52 cards. What is the theoretical probability of drawing a Jack as a fraction?	
46	A die is rolled 30 times, and it lands on a 6 nine times. What is the experimental probability of rolling a 6 as a fraction?	9/30 or 3/10
47	A spinner is spun 10 times, and it lands on red 4 times. What is the experimental probability of landing on red as a percent?	40%
48	What is the theoretical probability of drawing a club from a standard deck of cards? Provide your answer as a percent.	25%
49	A die is rolled 4 times, and it lands on a 2 twice. What is the experimental probability of rolling a 2 as a fraction?	2/4 or 1/2
50	A jar contains 25 marbles, 10 are red, and 5 are blue. What is the probability of picking a blue marble as a percent?	20%

Name: _____ 150

Theoretical vs Experimental Probability - # of Events

The theoretical and experimental probability of an event happening is not guaranteed to be the same. Performing more trials in an experiment will cause the experimental probability to be closer to the theoretical probability.

Example – if you flip a coin 2 times, it is easy to picture getting heads twice in a row. That would mean the experimental probability of getting a heads was 100% or 2/2. However, if you flipped the coin 100 times, it is almost impossible to get 100 heads in a row.

Part 1

...y times should you get a 1, 2, 3, 4, 5, or 6 when performing the ...lls below?

	1	2	3	4	5	6
6 rolls						
12 rolls						
60 rolls						
600 rolls						
1200 rolls						

Part 2

Follow the instructions bel... ...periments

1) Roll the dice 6 times. Tally your results.

1	2				6

2) Roll the dice 60 times. Record how many of each number you get.

	1	2	3	4	5	6
Tallies						
Total						

3) Did the experimental probability get closer to the theoretical probability when you rolled the dice more times? Explain why this happens.

Name: _____ 151

Theoretical vs Experimental - Dice

Part 1 What is the theoretical probability of the dependent events below?

	Scenario – What is the probability of...	Probability (Fraction)	Probability (Percent)
1)	Rolling a 1 and then a 2 using a 6-sided dice		
2)	Rolling a 4 and then a 4 using a 6-sided dice		
3)	Rolling a 3 and then a 3 using a 6-sided dice		
4)	Rolling a 6 and then a 6 using a 6-sided dice		
5)	Rolling a 1 three times in a row using a 6-sided dice		

Part 2 Follow the instructions to complete the experiments

1) The theoretical probability of rolling two 6's in a row is 1/36 or 2.7 percent. Try this experiment for yourself by filling in the table below.

Steps:

1) Get 2 dice or roll one dice twice.
2) Every time you roll, mark 1 tally.
3) If you get two sixes in a row, mark a tally under the 6/6 column.
4) Complete 36 trials. How many times should you roll double 6?

Number of Rolls - Tally	6/6

2) The theoretical probability of rolling a 1 and then a 2 is 1/36 or 2.7 percent. Complete the same steps as above for the numbers 1 and 2. Can you get more than 1 favourable outcome in 36 rolls?

Number of Rolls - Tally	1/2

Name: _____ 152

Rolling Doubles

Part 1 What is the theoretical probability of rolling doubles when rolling 2 dice

1) What is the theoretical probability of rolling doubles when rolling 2 six-sided dice?

Tip: favourable outcomes / total possible outcomes

2) How many times would you expect to roll doubles if you performed 24 trials?

Part 2 What is the experimental probability of rolling doubles when rolling 2 dice

1) Roll 2 six-sided dice 24 times and record your rolls you complete using the table below. Put a tally every time you roll doubles.

Number of Rolls	Doubles

2) Was your experimental probability the same as the theoretical probability? Why or why not?

3) Was your experimental probability the same as the other students in your class? Explain why or why not.

4) If you performed 1000 rolls, do you think your experimental probability would be closer or further from the theoretical probability? Explain.

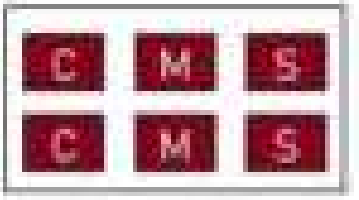
Name: _____ 153

Tree Diagrams – Independent Events

Questions Draw a tree diagram to help you find the probability of different combinations

There is a bag full of the following different flavoured chocolates:

- 2 coconut (C)
- 2 mint (M)
- 2 salted-caramel (S)



Draw a tree diagram for the following scenario:
You pull a chocolate and then put it back in the bag before pulling another chocolate

Tree Diagram	Combinations
1st Draw 2nd Draw	

1) How many combinations of chocolates could you draw? _____

2) What is the probability of drawing...	Fraction	Decimal	Percent
a) coconut and then mint			
b) mint and then coconut			
c) salted-caramel and then coconut or mint			
d) coconut, mint, or salted caramel and then mint			

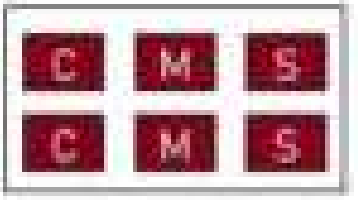
Name: _____ 15A

Tree Diagrams – Dependent Events

Questions Draw a tree diagram to help you find the probability of different combinations

There is a bag full of the following different flavoured chocolates:

- 2 coconut (C)
- 2 mint (M)
- 2 salted-caramel (S)



Draw a tree diagram for the following scenario:
You pull a chocolate and eat it before pulling another chocolate

Tree Diagram	Combinations
1st Draw 2nd Draw	

1) How many combinations of chocolates could you draw? _____

2) What is the probability of drawing...	Fraction	Decimal	Percent
a) coconut and then mint			
b) mint and then coconut			
c) salted-caramel and then coconut or mint			
d) coconut or salted-caramel and then mint			

Name: _____ 155

Tree Diagrams – Dependent Events

Questions Draw a tree diagram to help you find the probability of different combinations

Jeremy has 10 socks in his drawer.

- 2 of the socks are white
- 2 of th[illegible] are black
- 2 of [illegible]
- [illegible]
- 2 of [illegible]

Brad takes out two socks [illegible] after the other.

Draw a tree diagram to represent the scenario above

1) How many combinations of colours could you draw? _____

What is the probability taking out...	Fraction	Percent
2) A red sock and then a blue sock?		
3) Two black socks?		
4) A white sock and then a black sock?		

Name: _____ 15s

Tree Diagram – 4 Events

Questions Draw a tree diagram to help you find the probability of different combinations

Lane flips a coin 4 times. Draw a tree diagram that lists all the possible outcomes she could get as she flips the coins.

2) How many combinations could Lane get? _____

3) In this order, what is the probability that she flips the following...	Fraction	Percent
a) heads, heads, tails, tails		
b) heads, tails, heads, tails		
c) tails, tails, tails, heads		
d) 4 tails		
e) 2 heads and 2 tails in any order		
f) 1 heads and 3 tails in any order		

Name: _____ 157

Number Simulation – Independent Events

Part 1 Theoretical Probability – Answer the questions below

Pretend you are drawing two numbers from 1–15. Since these are independent events, you can select the same number more than once.

If you pick 3 numbers, what is the theoretical probability of...	
1) Picking ... numbers?	
2) Pi...	
3) P...	

If you compl... draw... bers)	
4) 10 trials, how m... odd numbers?	
5) 30 trials, how many t... you ... numbers?	
6) 100 trials, how many times ... y... bers?	

Part 2 Experimental Probability – Perform ... below

Set up the experiment by cutting the numbers out ... m in a bag. Perform the number of trials below by selecting 3 nu... the ... er. ... select a number, you put the number back in the bag befo... r.

Complete...	
1) 10 trials – how many times did you get all odd numbers?	
2) 30 trials – how many times did you get all odd numbers?	
3) 100 trials – how many times did you get all odd numbers?	

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	

Name: _____ 158

Number Simulation – Dependent Events

Part 1 Theoretical Probability – Answer the questions below

Pretend you have the numbers 1-15 on slips of paper in a bag. When you draw a number, you cannot get that number again for that trial. Each trial is selecting 3 numbers. Once you have completed a trial (selected 3 numbers), the numbers go back in the bag.

If you pu[illegible]umbers, what is the theoretical probability of...	
1) Pick[illegible]bers?	
2) P[illegible]	
3) Pick[illegible]a 2, t[illegible]en	

If you complete[illegible] dr[illegible]rs)	
4) 10 trials, how many t[illegible] yo[illegible]d numbers?	
5) 30 trials, how many times [illegible]bers?	
6) 100 trials, how many times would y[illegible] odd[illegible]?	

Part 2 Experimental Probability – Per[illegible]e ex[illegible]elow

Set up the experiment by cutting out the numbers bel[illegible]ing t[illegible] a bag. Perform the number of trials below by selecting 3 numb[illegible]. Re[illegible] select three numbers, you put the numbers back in the bag.

Complete...	
1) 10 trials – how many times did you get all odd numbers?	
2) 30 trials – how many times did you get all odd numbers?	
3) 100 trials – how many times did you get all odd numbers?	

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	

Name: _____ 159

Class List – Random Selections

Challenge Write your answers as a fraction

1) A class has 24 students. Ms. Lee is randomly picking students to hand out classroom prizes.

a) What is the probability that Eli is picked first?

b) What is the probability that either Eli or his best friend Sasha is picked first?

c) What is the probability that Eli is picked first and Sasha is picked second (without replacement)?

2) There are 24 students in the class. Ms. Lee picks three students for lunchroom duty. The order matters.

a) What is the probability that Jessa, Jenna, and Jordan are chosen in that exact order?

b) Jenna was picked, but there are two picks left. What is the probability that Eli and Sasha will both be chosen in that order?

3) Only 7 students haven't been chosen for any jobs yet. They are: Eli, Sasha, Jordan, Tasha, Leo, Amir, and Noah.

a) What is the probability that Tasha and Leo are picked next, back-to-back, in that order?

b) If Tasha and Leo are picked, what is the probability Amir is picked next?

c) Amir was picked and now only 4 students remain: Eli, Sasha, Jordan, and Noah. What is the probability that Noah won't be picked?

Name: _____ 1/6

Tree Diagrams – Dependent Events

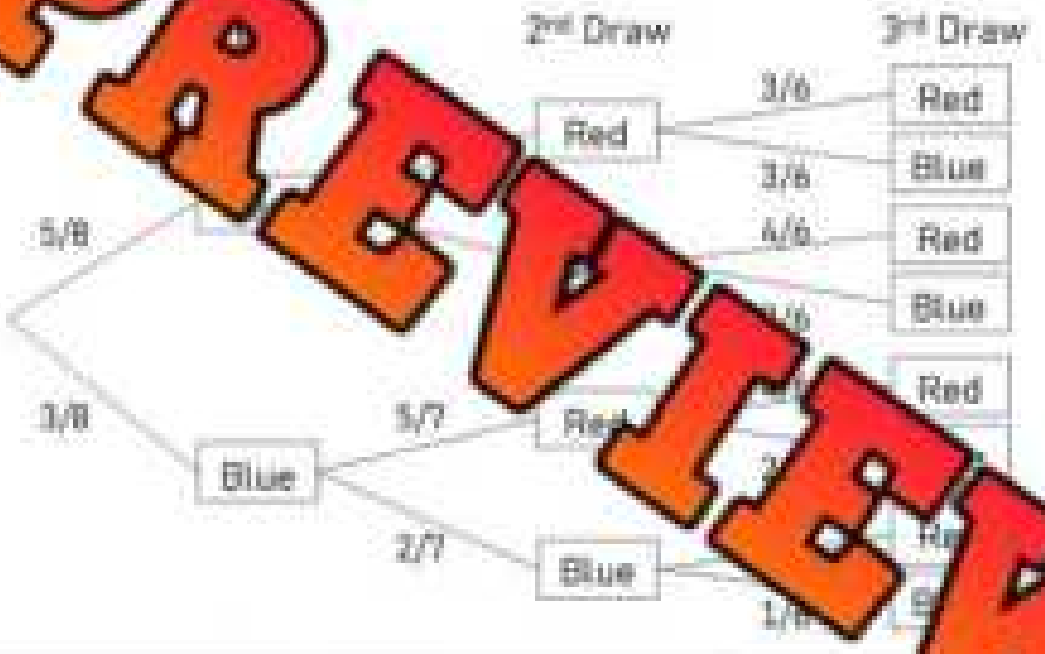
Questions Use the tree diagram to help you find the probability of different combinations

There is a bag full of the following different coloured beads:

- 5 red beads
- 3 blue beads

Ivy selects 3 beads from the box. She does not replace any of the beads before the next bead was selected.

Use the [illegible] tree diagram to solve the questions below.



What is the probability that Ivy will select...	Fraction	Percent
1) 3 red beads?		
2) 2 red beads in a row and then 1 blue bead?		
3) 3 blue beads in a row?		
4) 1 blue bead and then 2 red beads?		
5) 2 blue beads and then a red bead?		
6) 1 red bead and then 2 blue beads?		
7) Why are these trials dependent events?		

Name: _____ 161

Tree Diagrams – Dependent Events

Questions Draw a tree diagram to help you find the probability of different combinations

There is a box of multi-coloured candy with the following candies inside:

- 7 green (G) candies
- 4 orange (O) candies

Sage will select 3 candies from the box. She will not replace any of the candies before she takes the next ca

Fill in th n the tree diagrams below.

What is the probability that Sage will select...	Fraction	Percent
1) 3 green candies?		
2) 3 orange candies?		
3) 2 green candies and then 1 orange candy?		
4) 2 orange candies and then 1 green candy?		
5) 1 green candy and then 2 orange candies?		

Name: _____ 162

Tree Diagram – Free Throws

Part 1 Draw a tree diagram to help you find the probability of different combinations

When Roger goes to the free throw line in a game, he has a 0.5 chance of making the first free throw. He has a 0.4 chance of making the second free throw.

Fill in the blanks on the tree diagram below.

Part 2 Answer the questions below

What is the probability that Roger...	Decimal	Percent
1) makes the first free throw and misses the second		
2) misses the first free throw and makes the second		
3) makes both free throws		
4) misses both free throws		

Name: _____ 163

Tree Diagram – Dunk Contest

Questions Draw a tree diagram to help you find the probability of different combinations

Ryan is in his first dunk contest. He will try to perform 3 different dunks in the contest. He has practiced each dunk and learned the following:

- He has a 0.4 chance of completing the first dunk
- He has a chance of completing the second dunk
- He has a chance of completing the third dunk

Draw a tree diagram to show

What is the probability that Ryan will...	Decimal	Percent
1) make all three dunks		
2) make his first dunk and miss his next two		
3) miss his first dunk and then make his next two		
4) miss his first and second dunk and make his third		
5) make his first and second dunk and miss his third		

Name: _____ 164

Odds In Favour

Understanding Odds in Favour
Odds in favour compare the number of ways an event can happen to the number of ways it cannot happen. These are called **complementary** events because they cover all possible outcomes together.

While pr[illegible] tells us the chance of an event o[illegible]tal, odds are written as a ratio [illegible]mes to unfavourable ones.

Example:
If you roll two dice, there is 1 way to get a sum of 2 and 35 ways not to.

The odds in favour of rolling a sum of 2 are 1:35 (read as "1 to 35").

This means for every 1 way to roll a 2, there are 35 ways to roll something else.

Questions [illegible] in favour and display it as a ratio

#		Odds in Favour – Ratio
1	A soccer player scor[illegible] penalty kicks. What are the odds in **favour** of scoring one?	
2	A jar has 12 sour candies and 28 sweet candies. What are the odds in **favour** of pulling a sweet candy?	
3	A student guesses on a multiple choice test with 5 answer choices per question. What are the odds in **favour** of guessing the correct answer?	
4	A video game loot box gives a rare item 4 times out of 50 tries. What are the odds in **favour** of getting a rare item?	
5	A Grade 8 student has a playlist with 30 rock songs, 15 pop songs, and 5 classical tracks. What are the odds in **favour** of randomly hearing a rock or pop song?	
6	A library has 120 fiction books and 80 nonfiction books. What are the odds in **favour** of picking a fiction book at random?	

Name: _____ 165

Odds In Favour

Questions | Determine the odds in favour and display it as a ratio

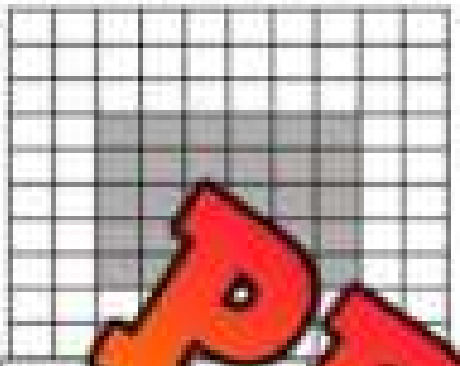
#	Word Problem	Odds in Favour – Ratio
1	A student rolls two dice. What are the odds in **favour** of getting a sum greater than 10?	
2	[illegible] 5 out of every 8 free throws. What [illegible] odds [illegible] making both shots in two attempts?	
3	A raffle has 50 total [illegible] What are the odds in **favour** of [illegible] winner is drawn?	
4	A vending machine has 8 different drinks, 3 [illegible] and 5 are sodas. What are the odds in **favour** of [illegible] fruit juice twice in a row without replacement?	
5	A student flips 3 coins. What are the odds in **favour** of getting exactly 2 heads?	
6	A combination lock has digits 0–5. What are the odds in **favour** of guessing the 3-digit code on the first try?	

Name: _____ 166

Unit Quiz - Probability

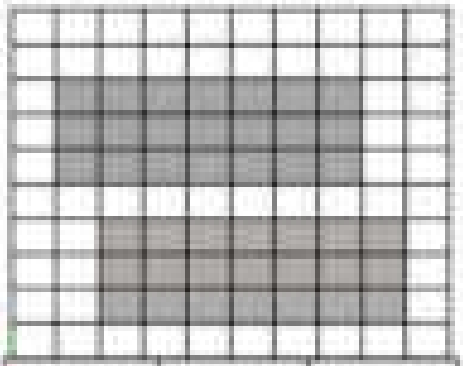
Part 1 Represent the probability of hitting the target using a fraction, decimal and percent

1)



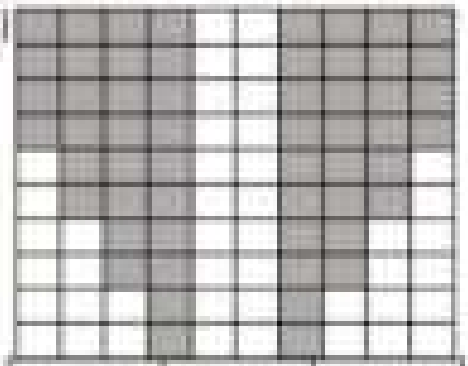
Fraction	Decimal	Percent

2)



Fraction	Decimal	Percent

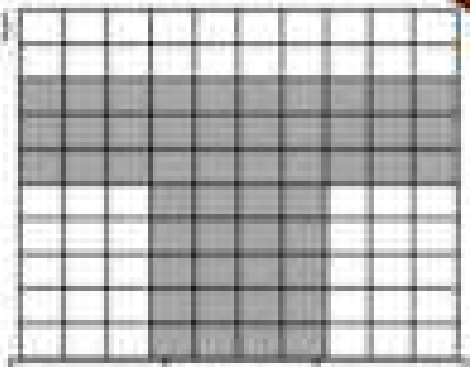
3)



Fraction	Decimal	Percent

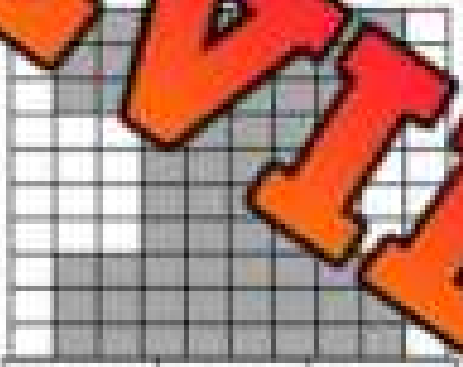
Part 2 What is the probability of hitting the target twice if you get 2 throws?

1)



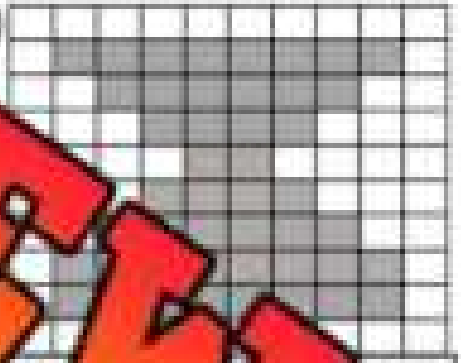
Fraction	Decimal	Percent

2)



Fraction	Decimal	Percent

3)

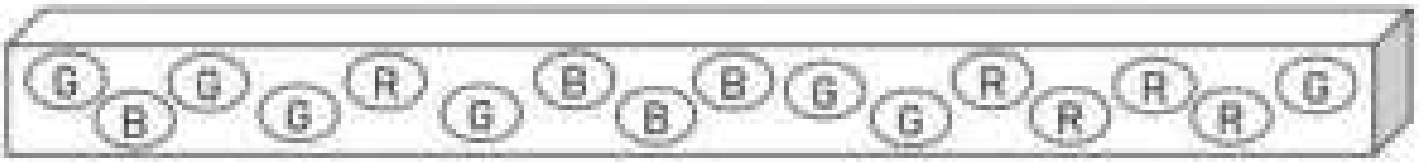


Fr	ercent

Part 3 Are the events independent or dependent?

1)	Raining today and then raining tomorrow	Dependent	Independent
2)	Pulling out a red marble from a box of multi-coloured marbles three times in a row	Dependent	Independent
3)	Drawing a heart from a standard deck of 52 cards twice in a row	Dependent	Independent
4)	Winning the lottery this year and next year	Dependent	Independent

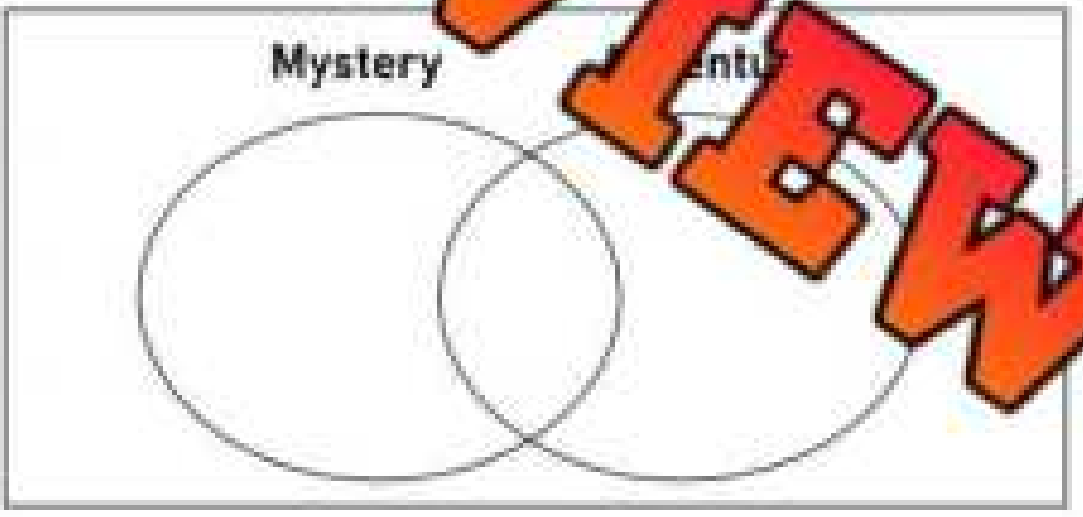
Part 4 What is the probability of the following scenarios when selecting candies from a box



	Scenario – Probability of…	Answer – Show Your Work
1)	Picking a green and then blue candy?	
2)	Pick[illegible]en candies?	
3)	[illegible]d, then green candy	

Part 5 Fill in [illegible] with the data below

In a class of 30 students [illegible] books, 17 like adventure books and 15 like both types of [illegible]

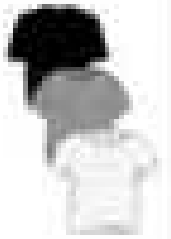


	What is the probability that a student…	Fraction	Decimal	Percent
1)	likes mystery books and not adventure books			
2)	likes adventure books			
3)	likes neither adventure nor mystery books			

Part 6 Draw a tree diagram to help you find the probability of different combinations

Dan has 9 different coloured shirts in his closet

- 4 of the shirts are white
- 3 of the shirts are black
- 2 of the shirts are grey



Dan has 3 more days of work this week and he wants to plan which shirts he will wear. He pulls out 3 shirts randomly as he is in a hurry.

1) Draw a tree diagram to represent the scenario above

2) How many combinations of shirts could he draw? _____

3) What is the probability of taking out...	Fraction	Percent
a) a white, then black, then grey shirt?		
b) three black shirts?		
c) a white shirt, and then two black shirts?		

Google Slides Lessons Preview

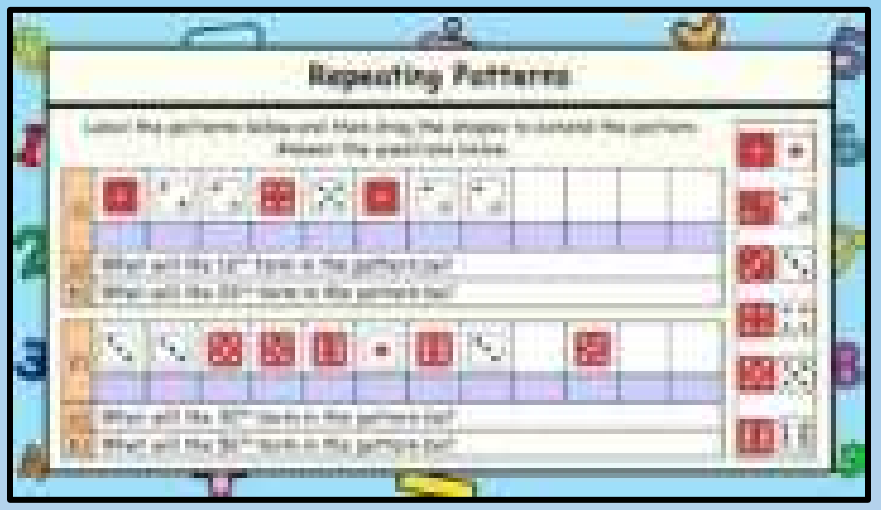
Ontario Math Curriculum

Algebra – Patterns, Equations – Grade 8

3-Part Lesson Format

Part 1 – Minds On!

- Learning Goals
- Discussion Questions
- Quotes
- And More!

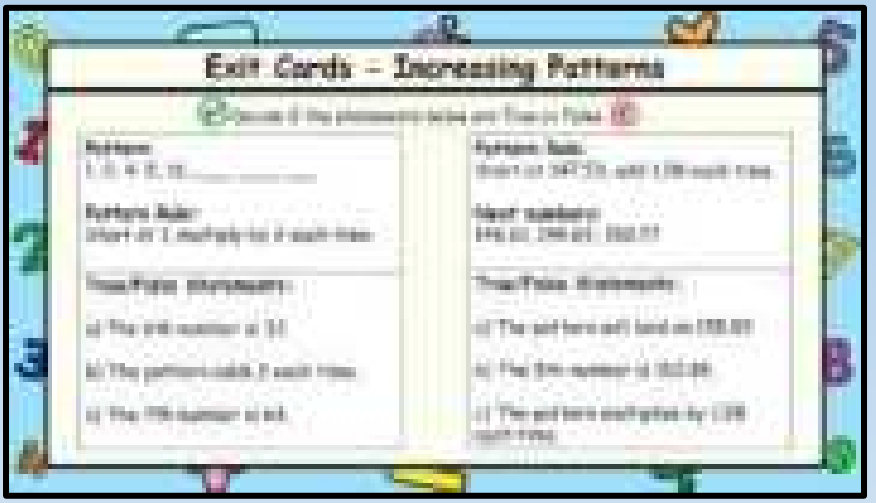


Part 2 – Action!

- Writing
- Matching
- Drag and Drop
- Drawing
- And More!

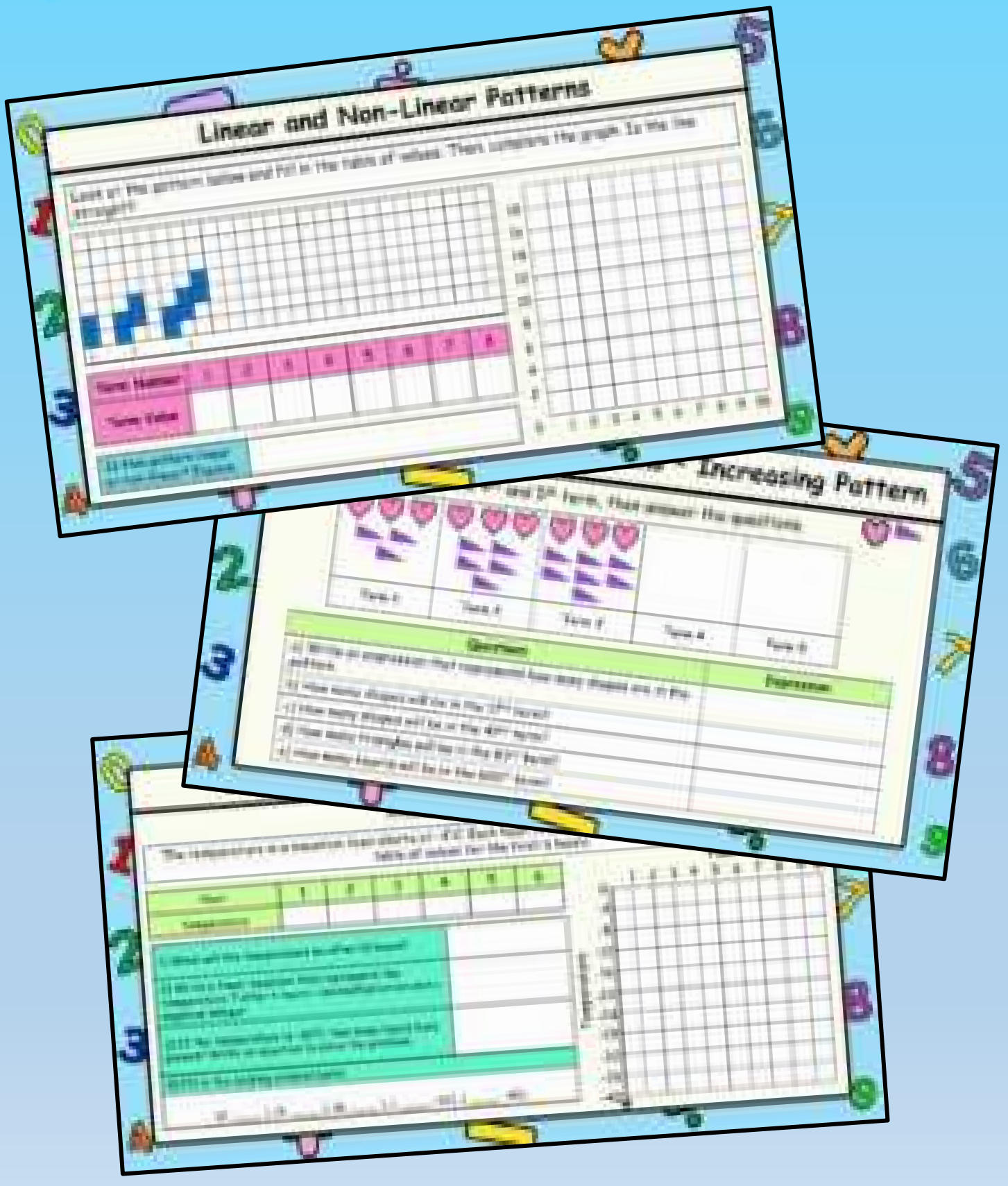
Part 3 – Consolidation!

- Exit Cards
- Quizzes
- Reflection
- And More!



Ontario Math Curriculum

Algebra – Patterns, Equations – Grade 8



Ontario Math Curriculum

Algebra – Patterns, Equations – Grade 8

Workbook Preview

Grade 8
C1. Patterns and Relationships

	Curriculum Expectations	Pages That Cover the Expectations
C1.1	identify and compare a variety of repeating, growing, and shrinking patterns, including patterns found in real-life contexts, and compare linear growing and shrinking patterns on the basis of their constant rates and initial values	5 – 7, 11, 39 – 49, 52 – 57, 60 – 61
C1.2	create and translate repeating, growing, and shrinking patterns involving rational numbers using various representations, including algebraic expressions and equations for linear growing and shrinking patterns	35 – 38, 42 – 43, 50 – 51, 58 – 59
C1.3	determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in growing and shrinking patterns involving rational numbers, and use algebraic representations of the pattern rules to solve for unknown values in linear growing and shrinking patterns	8 – 10, 12 – 34, 52 – 57, 60 – 61
C1.4	create and describe patterns to illustrate relationships among rational numbers	62 – 80

Name: _____ 16

Pattern Rule – Input/Output Tables

Instructions Fill in the input/output tables below.

Rule: add 4	
In	Out
112	
121	
143	

Rule: add 7	
In	Out
235	
251	
274	
295	

Rule: add 12	
In	Out
344	
361	
387	
408	

Rule: su	
In	
473	
486	
504	
527	

subtract 11	
	Out
574	
592	
60	
646	

Rule: Subtract 9	
In	Out
778	
791	
807	
827	

Rule: multiply by 2	
In	Out
3	
12	
25	
41	

Rule: multiply by	
In	Out
5	
9	
13	
17	

iply by 7	
	ut
10	
12	

Rule: divide by 3	
In	Out
150	
240	
300	
390	

Rule: divide by 4	
In	Out
40	
80	
100	
240	

Rule: divide by 6	
In	Out
48	
72	
120	
180	

Name: _____ 20

Algebra Jeopardy

Objective What are we learning about?

To reinforce students' understanding of basic algebraic concepts and their application to solve simple equations and word problems in a fun and competitive game for

Mat you need for the activity?

- Jeopardy
- Buzzer or bell

Instructions How will you comp

1. Print the Jeopardy board on the next p
2. Divide the class into two teams.
3. Ask one team to go first by selecting a point value.
4. Read the question aloud from the point value.
5. The first team to ring the bell or buzzer gets to answer.
6. If they answer correctly, award them the points. If not, another team can answer.
7. Continue the game until all questions have been answered.
8. Tally the points to determine the winning team.
9. Conclude by discussing what they learned about the topic in the questions.

Name: ______________________ 21

Jeopardy Questions | Ask students the questions below

$100	$200	$300	$400	$500
87, 93, 99, ____	5.2, 5.5, 5.8, ____	Start at 1, multiply by 3 and add 1, what is the fourth term?	A plant grows 3.5 cm every week. If it was 12.3 cm tall at the start, how tall will it be after 3 weeks?	A builder lays 14.5 bricks per hour. If they have already laid 58 bricks, how many bricks will they have laid after 4 more hours of work?
14[illegible] 170, ____	[illegible]	[illegible]t at 6, divide by 2 [illegible]dd 1, what is [illegible]	A rabbit population doubles every year. If there are 4 rabbits this year, how many will there be in 5 years?	A runner increases their distance by 1.75 km every week. If they started at 5.25 km, how far will they be running after 10 weeks?
82, 75, 68, ____	18.52, 18.59, 18.66, ____	Sta[illegible] 2 and a[illegible], w[illegible] the fifth ter[illegible]	[illegible]ed increases [illegible]ery hour [illegible]t 48 [illegible]km/h [illegible] speed [illegible]	A teacher's class size increases by 3.5 students every term. If the initial class size was 20 students, what will the class size be after 4 terms?
177, 168, 159, ____	35.7, 35.1, 34.5, ____	Start at 3, multiply by 4 and subtract 2, what is the fourth term?	[illegible] meters [illegible] 5 meters [illegible] day, and 7.5 m[illegible] the third day. How [illegible] will it travel in total by the sixth day?	[illegible]es a raise of [illegible]ry year. If his [illegible]5,000, w[illegible]er 4 [illegible]
2, 10, 50, ____	17.3, 16.8, 16.3, ____	Start at 7, multiply by 3 and subtract 1, what is the third term?	A train travels 75 km in the first hour, 112.5 km in the second hour, and 150 km in the third hour. How far will it travel in total by the fifth hour?	A swimm[illegible] increases their training distance by 2.25 km every week. If they started at 4.75 km, how far will they be swimming after 8 weeks?
9, 18, 36, ____	11.32, 11.53, 11.74, ____	Start at 6, multiply by 5 and add 2, what is the fourth term?	A tree grows 5.5 inches in the first year, 7.5 inches in the second year, and 9.5 inches in the third year. How much will it have grown in total by the sixth year?	A bank account balance increases by $75.50 every month due to interest. If the initial balance was $2500, what will the balance be after 10 months?

Name: _____ 22

Table of Values – Finding Term N

When finding a random term in a pattern, we can use a variable. Often *n* is used to take the place of the term number. When we use *n*, we can change the value to find the term value for any term number.

We can find the value for *n* by looking at the pattern between the term number and term value. To do this, we look across the table from the term number to the term value.

Practice ... the pattern rule when you look across the table of values.

Term Number	Term Value
1	
2	12
3	18
4	
5	
8	

1) 6n

Term Number	Term Value
	3
2	8
3	
4	
5	
9	

2) 5n – 2

Term Number	Term Value
1	4
2	8
3	12
4	16

3) _____

Term Number	Term Value
1	9
2	16
3	23
4	30
5	
9	

4) _____

Term Number	Term Value
1	6
2	9
3	12
4	15
5	
10	

5) _____

Term Number	Term Value
1	4
2	10
3	16
4	22
5	
11	

6) _____

Name: _____ 23

Table of Values – Finding Term N

Practice Find the pattern rule when you look across the table of values.

Term Number	Term Value
1	10
2	15
3	
8	

1) _____

Term Number	Term Value
1	7
2	17
3	27
4	37
5	

Term Number	Term Value
1	5
2	13
3	21
4	29
5	
11	

3) _____

Term Number	Term Value
1	5
2	15
3	25
4	35
5	
11	

4) _____

Term Number	Term Value
2	
3	
4	32
5	
11	

5) _____

Term Number	Term Value
1	8
2	14
3	23
4	32

6) _____

Word Problem Use a table of values and find the n^{th} term.

Owen's earnings are increasing in a pattern as he gets more customers. He earned $100 in his first month, $330 in his second month, $1020 in the third month and $3090 in the fourth month.

a) How much will he earn in the 5th month if the pattern continues?

b) How much will he earn in the 10th month if the pattern continues?

Name: _____ 24

Using Algebraic Expressions

In the expression $6y + 5$, the 6 is the **numerical coefficient** of the variable and the 5 is the **constant term**. The **variable** is the y, which can represent any number.

Part 1 Use the algebraic expression to fill in the tables.

Term Number	Term Value
1	
2	
3	
4	
5	
8	

1) $5x + 2$

Term Number	Term Value
1	
2	
3	
4	
5	
9	

2) $4x$

Term Number	Term Value
1	
2	
3	
4	
5	
11	

3) $t + 9$

Term Number	Term Value
1	
2	
3	
4	
5	
11	

4) $4n - 3$

Term Number	Term Value
1	
2	
4	
5	
10	
20	

5) $20 - x + 8$

Term Number	Term Value
1	
2	
4	
5	
5	
11	

6) $7x - 6$

Part 2 Write 4 algebraic expressions using:
Variable = n Constant term = 12 Numerical coefficient = 4

1	
2	

3	
4	

Name: _____ 25

Pattern Rule – Input/Output Tables

Instructions Fill in the input/output tables below.

1)

In n	Out $3n$
1	
2	
3	
4	
5	

2)

In n	Out $3n + 2$
1	
2	
3	
4	
5	

3)

In n	Out $4n - 4$
1	
2	
3	
4	
5	

4)

In x	Out $5x - 4$
10	
20	
30	
40	
50	

5)

In x	Out $8x$
2	
4	
6	
8	
10	

6)

In x	Out $50 \div x$
1	

7)

In p	Out $7p + 20$
20	
40	
60	
80	
100	

8)

In p	Out $10p - 15$
3	
6	
9	
12	
15	

9)

In p	Out $8p + 100$
5	
10	
15	
20	
25	

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Fill in the input/output tables below.

In n	Out $12x + 3$
3	
5	
7	
9	
11	

Name: _____

Fill in the input/output tables below.

In n	Out $12x + 3$
3	
5	
7	
9	
11	

Name: _____

Fill in the input/output tables below.

In n	Out $12x + 3$
3	
5	
7	
9	
11	

Name: _____

Fill in the input/output tables below.

In n	Out $12x + 3$
3	
5	
7	
9	
11	

Name: _____ 27

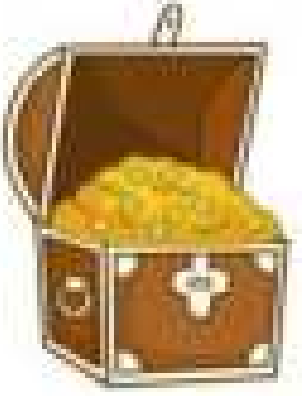
Activity Title: Algebraic Adventure Hunt

Objective — What are we learning about?

To help students understand and practice filling in input/output tables using given expressions involving all four operations through a fun and engaging treasure hunt.

Materials — What will you need for the activity?

- Stopwatch or timer (or use a smartphone)
- Index cards
- Markers
- Small prizes or treats (for
- Tape



Instructions — How will you complete the activity?

1) Cut out the index cards with the input/output tables printed on them. These will be the treasure hunt challenge questions.
2) Hide these cards around the classroom or in a designated area. Consider taping them under chairs, desks, or tucked into non-obvious spots.
3) Divide the class into small teams and give each team a stopwatch.
4) Explain the game: each team will hunt for a card, fill in the table as quickly as they can, and return to you for verification.
5) Start the timer when you say "Go!" Each team rushes to find their first card.
6) When a team thinks they have the correct answer, they come back to you for verification. If they get it right, the teacher keeps the card. If the answer is wrong, they can try again or hide the card back in its original spot and find a new card.
7) The game continues until all cards are found or you call time. The team with the most correct answers wins.
8) Discuss the game, focusing on the concepts taught on the cards.

Name ______________________ 31

Instructions Cut out the cards below.

In h	Out h ÷ 6 + 5	In f	Out 5f − 51	In e	Out 15e + 2[illegible]	In b	Out b ÷ 7 - 7
12		15		5		[illegible]	
24		20		9		70	
36		25		13		84	
48		30		[illegible]		98	
60		35		[illegible]		112	

In k	Out k ÷ 4 −18	In g	Out 13g [illegible]	In [illegible]	Out d ÷ 9 − 5	In c	Out 5c + 55
112		7		[illegible]		3	
240		14		72		5	
304		21		99		7	
368		[illegible]		126		9	
432		35		153		11	

Name: _____ 33

Growing Patterns

Instructions How many blocks are in each term? Sketch the next 3 terms.

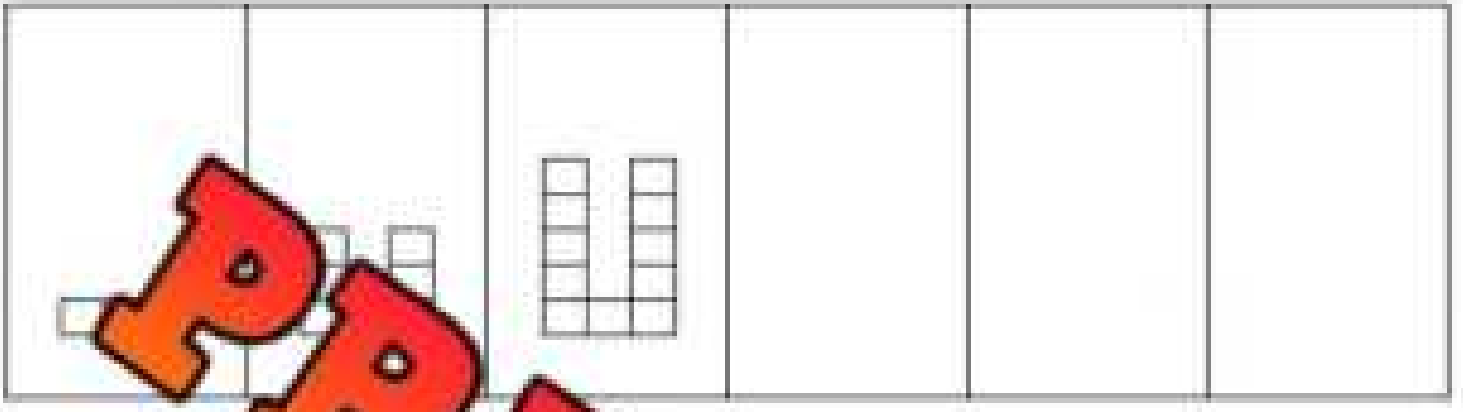
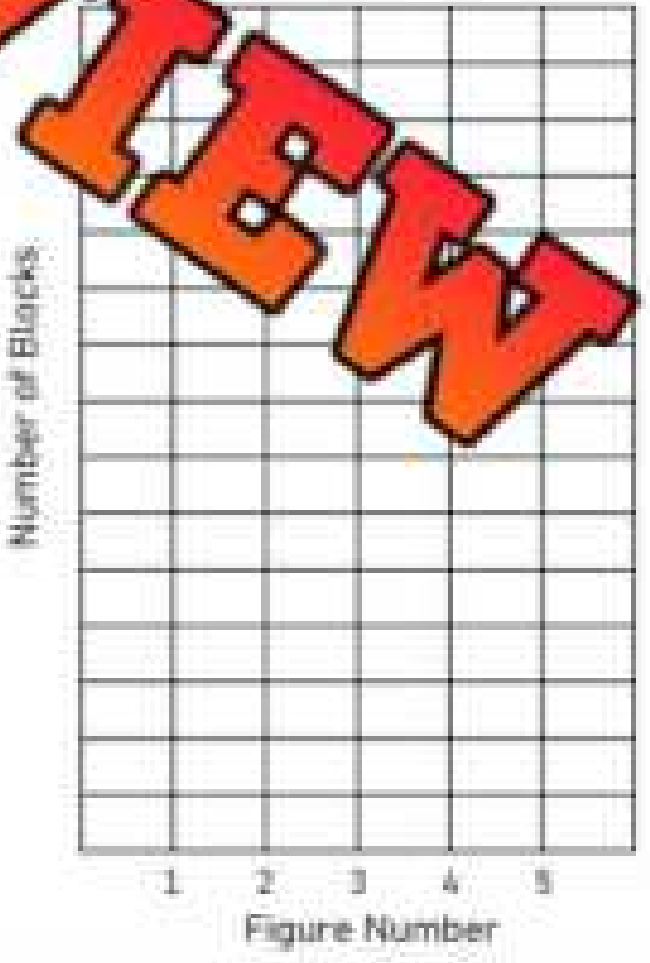


Figure Number	1	2	3	4	5	20	50
Number of Blocks							

1) Describe the recursive pattern?

2) What is the functional relationship between the variables? (Write the expression)

3) How many blocks would the 100th figure have?



Name: _____ 35

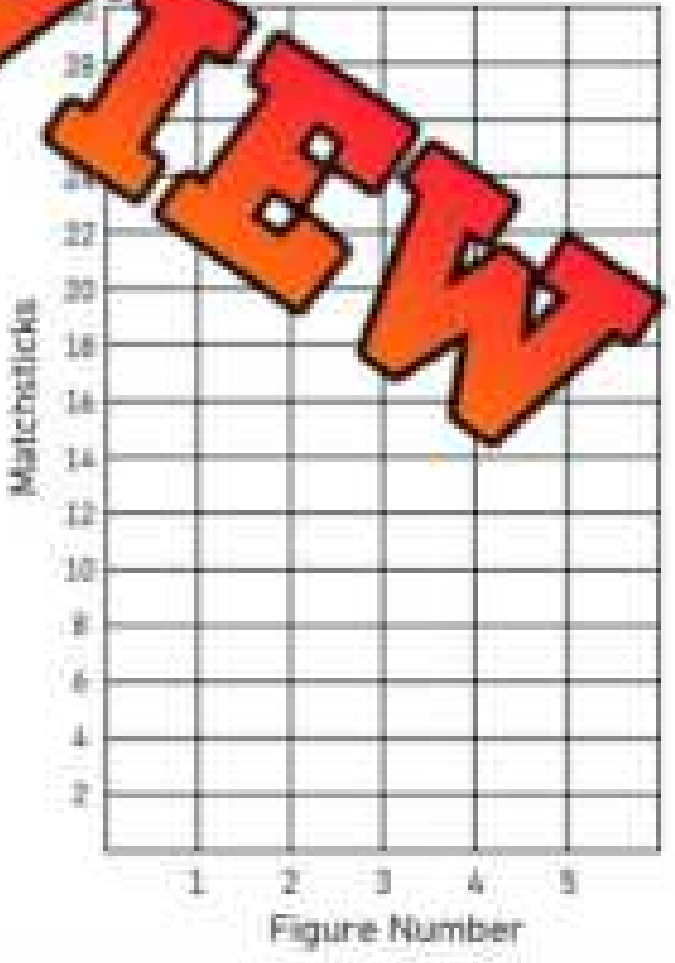
Matchstick Growing Patterns

Instructions How many matchsticks are in each figure? Draw the next 2 figures.

F-1	F-2	F-3	F-4	F-5

Figure Number	1	2	3	4	5	10	20
Number of Matchsticks							

Questions
1) Write an expression that represents the functional relationship.
2) How many matchsticks will the 7th term have?
3) How many matchsticks will the 10th term have?
4) What figure would use 201 matchsticks?



Name: _____ 37

Shrinking Patterns

Instructions How many grey blocks are in each term?

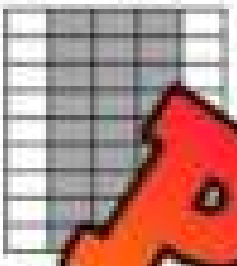
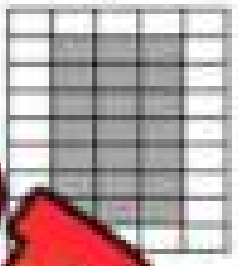
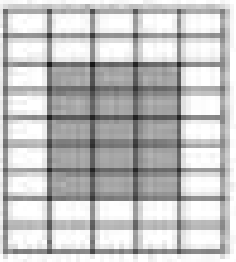
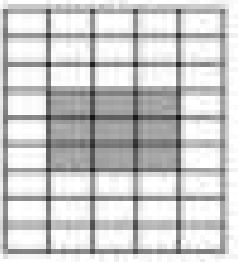
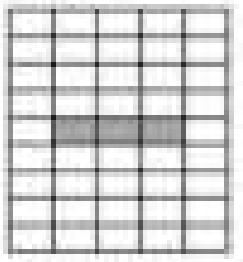
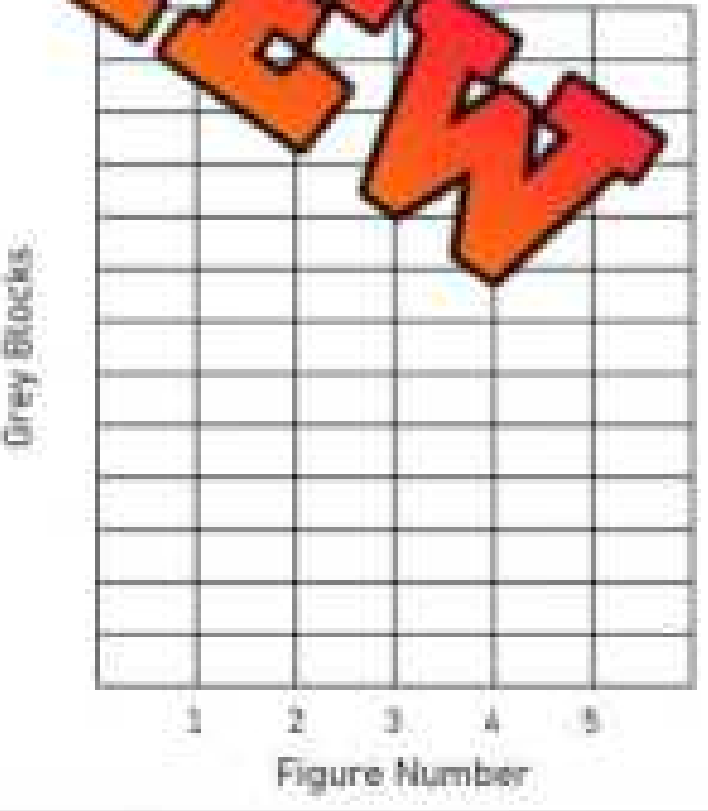
Figure 1	Figure 2	Figure 3	Figure 4	Figure 5
				

Figure Numb	2	3	4	5
Number Of Grey Blocks				
Number Of White Blocks				
Number Of Total Blocks				

Write the functional relationship between the two-variables below (Write the expression)
1) Figure number and grey blocks
2) Figure number and white blocks



Name: _____ 39

Two-Variable Linear Relationships

A **two-variable linear relationship** is when the increasing or decreasing of one variable causes a corresponding increase or decrease in the other variable. For example, driving 100km/hr would be a linear relationship between time driving and distance driven (for every hour driven, you travel 100km). As you drive longer, you travel further at a predictable distance.

Instructions: Fill in the tables and answer the questions.

1) Cl[illegible] for today has been represented in the table below

Ho[illegible]	1	2	3	4	5	6	7	8
Money Ear[illegible]		44	66					

a) Is the relati[illegible] variables linear? Yes No

b) What is the funct[illegible] variables? _____

2) John sells cars. He earns a comm[illegible] is a car. His earnings for last week are represented in [illegible] were some days he did not earn commission.

Days Worked (x)	0	1	2	[illegible]	[illegible]	6	7
Money Earned (y)	0	140	280	[illegible]	[illegible]	[illegible]40	1280

a) Is the relationship between variables linear? Yes

b) If you graphed this relationship, would the line be straight[illegible]in.

3) Greg has a membership to a shopping website. He pays a yearly membership fee and orders the same thing each week for 10 weeks. His spending is displayed below.

Weeks (x)	0	1	2	3	4	5	6	7
Money Spent (y)	50	80	110	140	170	200	230	260

a) Is the relationship between variables linear? Yes No

b) What is the functional relationship between variables? _____

c) If you graphed this relationship, would the line be straight or curved? Explain.

Name: ______________________ 40

Two-Variable Linear Relationships

Instructions Answer the question below.

1) At an ice cream shop, you pay for the cone and then more money for every scoop you add.

Scoops (x)	0	1	2	3	4	5
Cost [illegible]	$2.00	$2.50	$3.00	$3.50	$4.00	$4.50

a) What [illegible] relationship between the two variables (algebraic expression)?

b) How much [illegible] cost?

c) How much would [illegible] cost on a cone?

2) It costs $15 for admission [illegible] inside, you pay for each additional ride you go on.

Rides (x)	0	1	2	[illegible]	4	5
Total Cost (y)	$15.00	$17.50	[illegible]	[illegible]	[illegible]	$27.50

a) What is the functional relationship between the [illegible] (alge[illegible]pression)

b) How much would it cost to go on 50 rides?

3) Roger rents a truck and pays a set rate for every 10km he drives.

KM Driven (x)	0	10	20	30	40	50	60	70	80
Cost (y)	$50	$55	$60	$65	$70	$75	$80	$85	$90

a) What is the functional relationship between the two variables (algebraic expression)

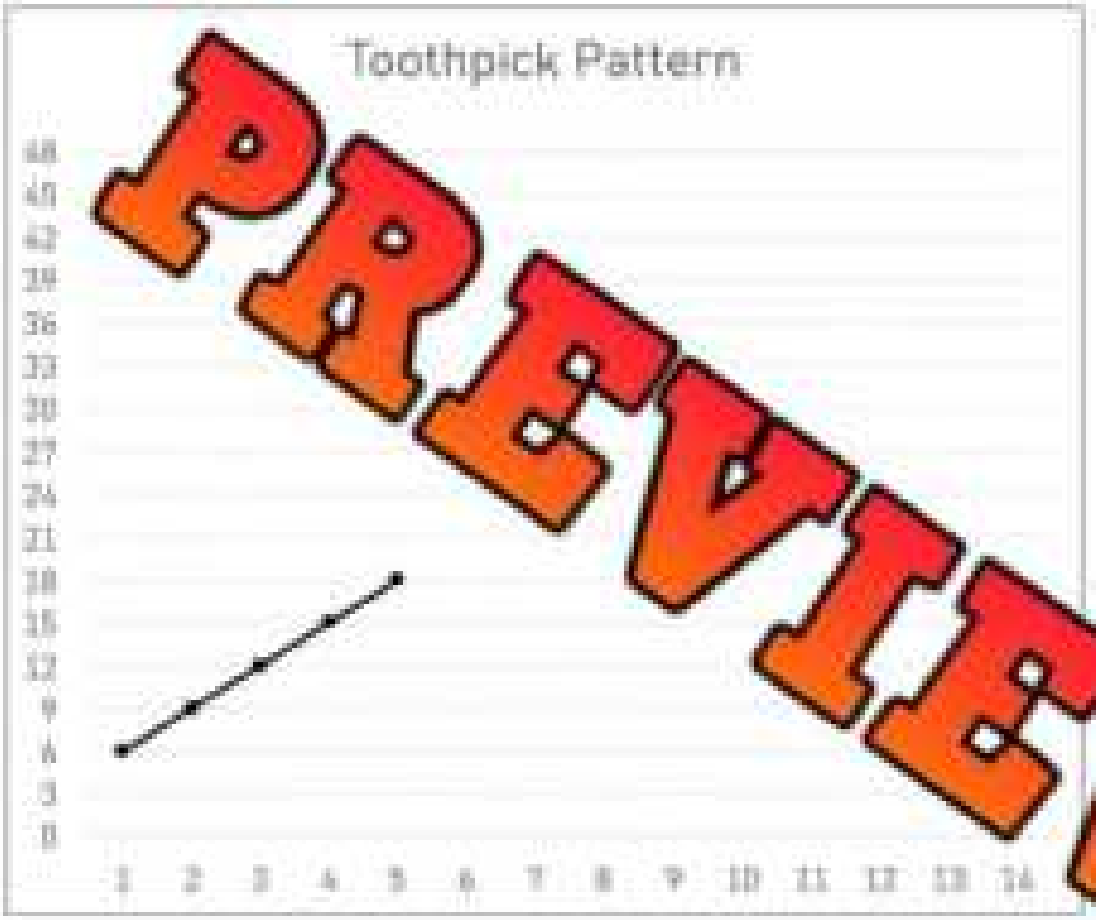
b) How much would it cost to drive 250km?

Name: _____ 41

Reading a Linear Pattern - Graph

A **linear** pattern displays a constant rate of change. The pattern increases or decreases by the same amount each time.

Instructions Continue the line on the graph and fill in the table of values.



Term Number	Term Value
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	

1) Draw the toothpick pattern below for the graph/table of values. Use any design you'd like.

Term 1	Term 2	Term 3	Term 4	Term 5

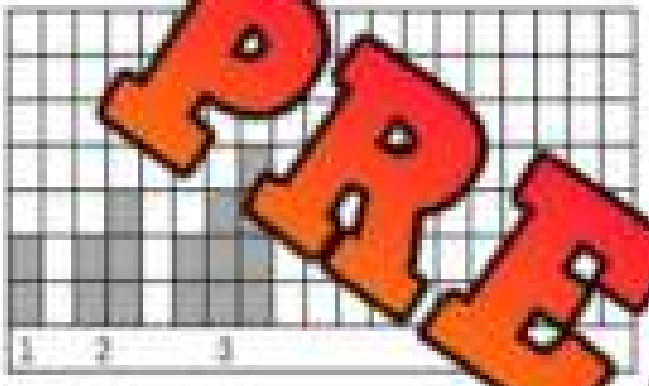
2) What is the constant rate of change?

Name: _____ 42

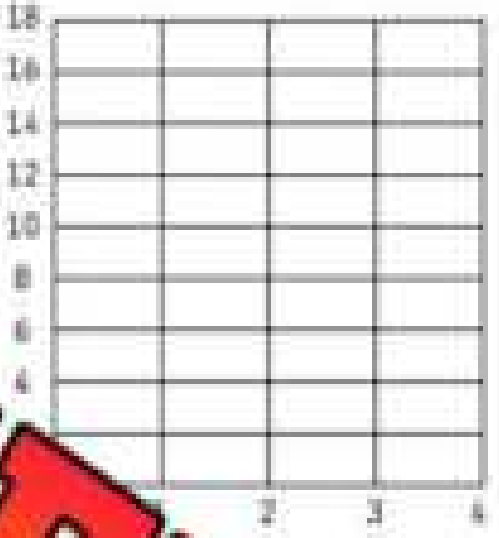
Linear and Non-Linear Patterns

Not all patterns are linear. Some patterns increase/decrease by the same amount each time, while others grow/shrink at different rates. When the pattern grows or shrinks by different amounts, it is called **non-linear.**

Instruction Look at the patterns below and fill in the table of values. Then complete the graph. Is the line straight?



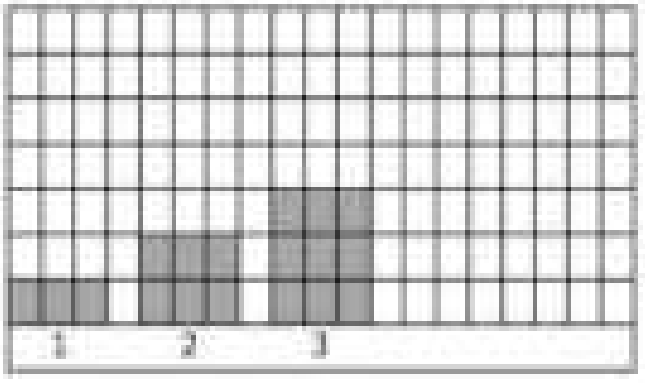
Term Number	Term Value
1	
2	
3	



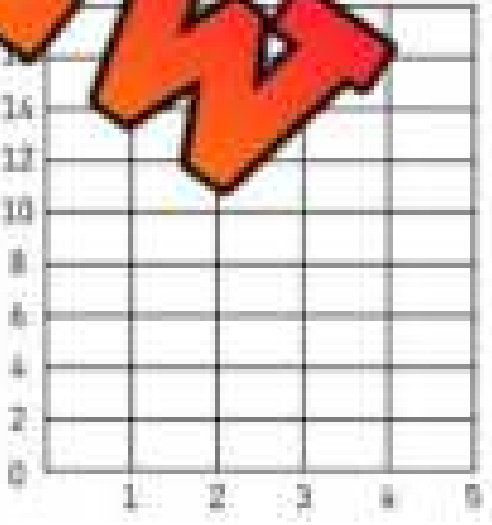
1) Is this pattern linear or non-linear? Explain

_____

_____



Term Number	Term Value
1	
2	
3	
4	
5	



1) Is this pattern linear or non-linear? Explain

_____

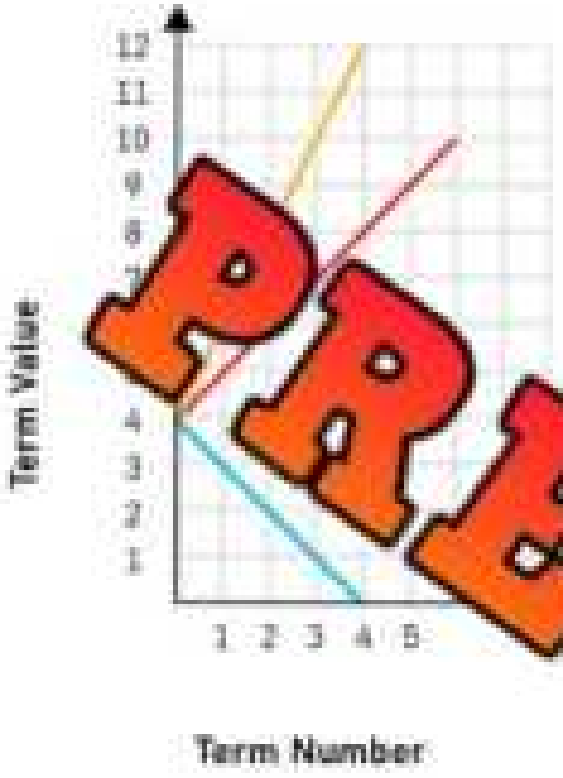
_____

2) How many blocks would be in term number 10?

Name: _____ 43

Linear and Non-Linear Patterns

Instruction Look at the graphs closely. Answer the questions below.



1) How are the lines the same?

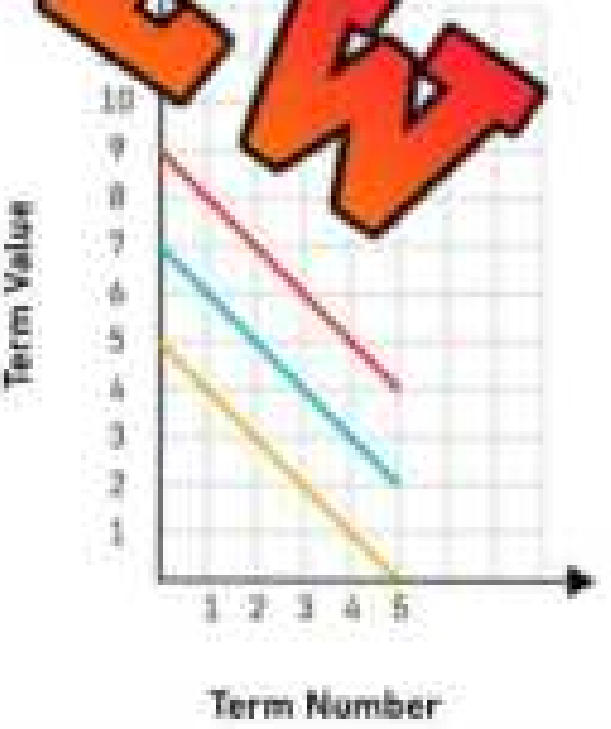
2) How are the lines different?

3) What could these three lines represent?

1) How are the lines the same?

2) How are the lines different?

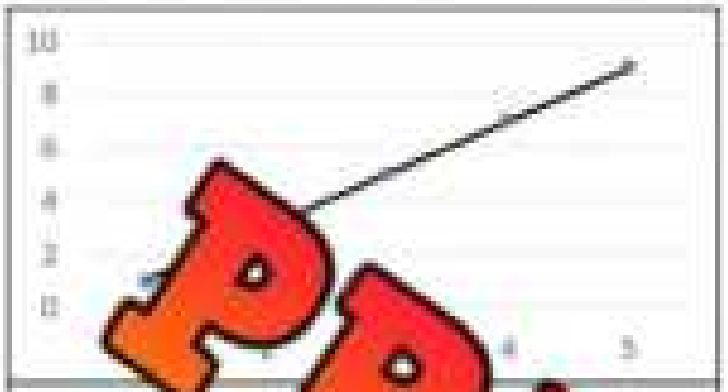
3) What could these three lines represent?



Name: _____ 44

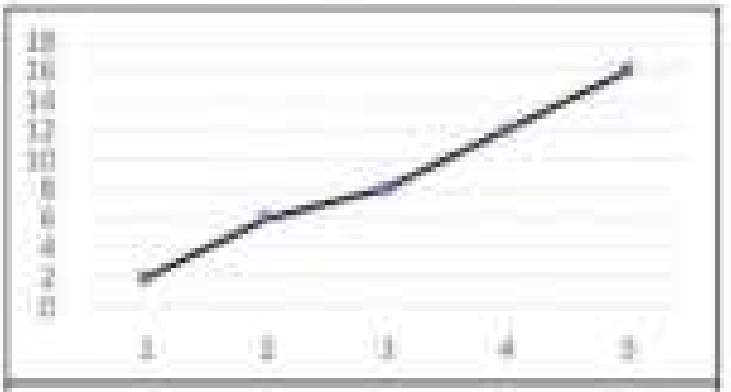
Increasing Linear Patterns – Yes or No?

Instructions Circle if the pattern displayed on the graph is linear or not.



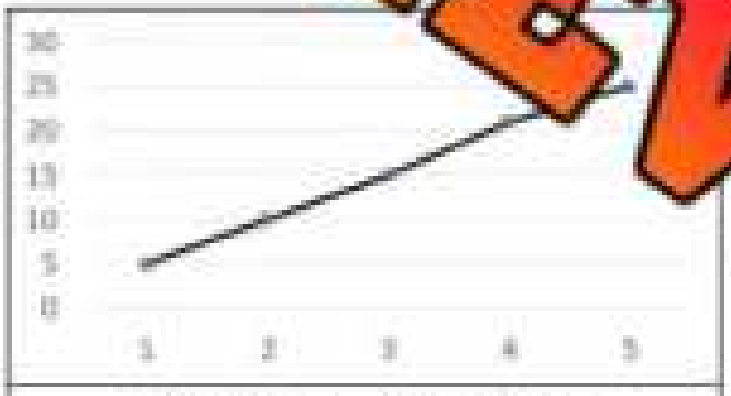
1) Linear Non-Linear

Rate of change =



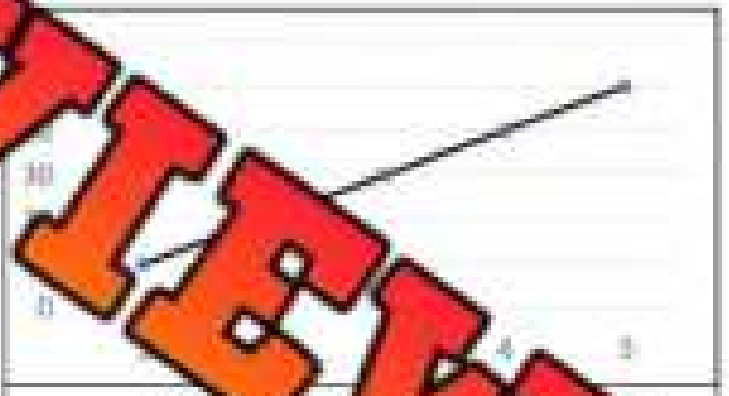
2) Linear Non-Linear

Rate of change =



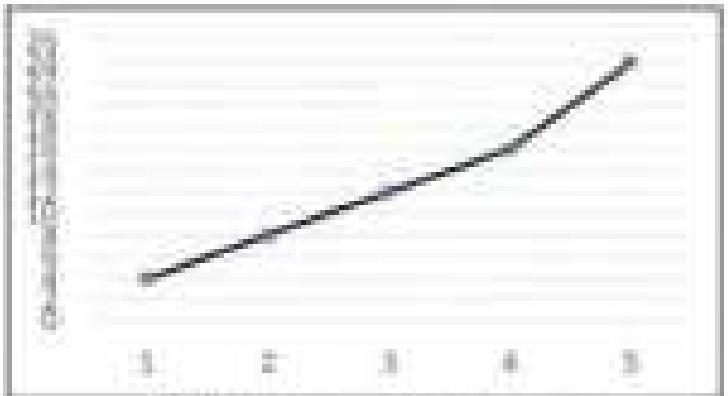
3) Linear Non-Linear

Rate of change =



4) Linear Non-Linear

Rate of change =



5) Linear Non-Linear

Rate of change =

6) Linear Non-Linear

Rate of change =

Name: _____ 45

Increasing Linear Patterns – Yes or No?

Instructions Circle if the pattern is linear or not, based on the table of values.

Term Number	Term Value
1	5
2	9
3	13
4	17
5	21
Linear	Non-Linear

Term Number	Term Value
1	37
2	44
3	51
4	57
5	64
Linear	Non-Linear

Term Number	Term Value
1	88
2	96
3	104
4	112
5	120
Linear	Non-Linear

Term Number	Term Value
1	2.5
2	4.5
3	6.5
4	8.5
5	10.5
Linear	Non-Linear

Term Number	Term Value
1	5
2	10
3	15
4	17
5	21.5
Linear	Non-Linear

Term Number	Term Value
1	200
2	275
3	350
4	425
5	[illegible]
[illegible]	[illegible]-Linear

Term Number	Term Value
1	44.0
2	47.5
3	50.5
4	54.0
5	57.5
Linear	Non-Linear

Term Number	Term Value
1	140
2	280
3	420
4	580
5	720
Linear	Non-Linear

Term Number	Term Value
1	112.1
2	112.3
3	112.5
4	112.7
5	112.9
Linear	Non-Linear

Name: _____ 47

Comparing Rates of Change

Questions Circle which variable (x or y) increases at a greater rate of change.

1) Term Number	1	2	3	4	5
x	25	45	65	85	105
y	10	35	60	85	110
	x	or	y		

2) T	1	2	3	4	5
	17	123	129	135	141
y	13	144	149	154	159
		or	y		

3) Term Number	1	2	3	4	5
x	2		27	249	261
y	364			403	416
	x	or	y		

4) Term Number	1	2	3	4	5
x	0.5	1.2			3
y	12.1	12.7	13.3		
	x	or	y		

5) Term Number	1	2	3	4	5
x	141	158	175	192	209
y	513	529	545	561	577
	x	or	y		

6) Term Number	1	2	3	4	5
x	17.8	19.9	22.0	24.1	26.2
y	22.3	23.7	25.1	26.5	27.9
	x	or	y		

Name: _____ 48

Comparing Rates of Pay - Employees

Jeffrey is the boss at his company. He determines how much to pay his employees. Sometimes, Jeffrey pays his employees a starting bonus, where they get a one-time payment for starting their job.

Questions Who will get paid more money over time?

Weeks	0	1	2	3	4	5	6	7
Cotton's Earnings ($)	1000	1400	1800	2200				
Spence's Earnings ($)	0	500	1000	1500				

a) Who will earn more after 7 weeks? _____

b) How much is Cotton's earnings per week? _____

c) How much is Spence's earnings per week? _____

d) Whose earnings increase at a greater rate? _____

Weeks	0	1	2	3	4	5	6	7
Jacob's Earnings ($)	0	750	1500					
Jeremy's Earnings ($)	1500	2000	2500					

a) Who will earn more after 7 weeks? _____

b) How much is Jacob's earnings per week? _____

c) How much is Jeremy's earnings per week? _____

d) If we graphed both of their earnings, whose graph would be steeper? _____

Weeks	0	1	2	3	4	5	6	7
Amelia's Earnings ($)	2500	3350	4200	5050				
Raven's Earnings ($)	0	1150	2300	3450				

a) Who earned a bonus to start their job? _____

b) How much is Amelia's earnings per week? _____

c) How much is Raven's earnings per week? _____

d) Who will earn more after 7 weeks? _____ How much more will they earn? _____

Name: _____ 50

Writing Algebraic Expressions

Practice Answer the question below.

1)	Situation	Expression/Answer
a)	Caleb sells lemonade at his stand. For every sale (s), he earns $4. Write the expression.	
b)	Caleb [illegible] sales Monday. How much money did he ma[illegible] expression and the answer.	
c)	[illegible] sold 25 [illegible] the week. How much money did he make? Wri[illegible] and the answer.	
d)	Caleb earned $[illegible] lemonade. How many cups (c) did he sell?	

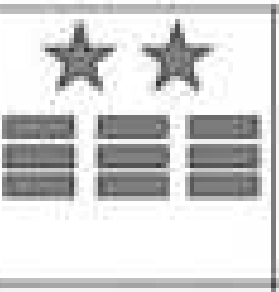
2)	Situation	Expression/Answer
a)	Maya earns $16 for every hour (h) she works. She has to spend $3 each time she works to take the bus. Write the expression.	
b)	Maya worked 7 hours yesterday. How much money did she take home? Write the expression and the answer.	
c)	Maya earned $141 today after she paid for her bus ride. How many hours did she work? Write the expression and the answer.	

3)	Situation	Expression/Answer
a)	Isaac is driving across Ontario to visit a friend. For every hour (h) he drives, he travels 115km. Write the expression.	
b)	Isaac drove 11 hours today. How far did he go? Write the expression and the answer.	
c)	Isaac needs to drive 920km. How many hours does he need to drive?	

Name: _____ 51

Writing Algebraic Expressions – Growing Pattern

Questions Draw the 4th and 5th term, then answer the questions.

Term 1	Term 2	Term 3	Term 4	Term 5
				

1) Questions	Expression
a) Write an expression that represents how many shapes are in the pattern using the variable n for term number	
b) How many shapes will be in the 10th term?	
c) How many shapes will be in the 20th term?	
d) How many **rectangles** will be in the 50th term?	
e) How many **stars** will be in the 1000th term?	

Term 1	Term 2	Term 3	Term 4	Term 5
				

2) Questions	Expression
a) Write an expression that represents how many shapes are in the pattern using the variable n for term number	
b) How many shapes will be in the 10th term?	
c) How many shapes will be in the 20th term?	
d) How many **rectangles** will be in the 50th term?	

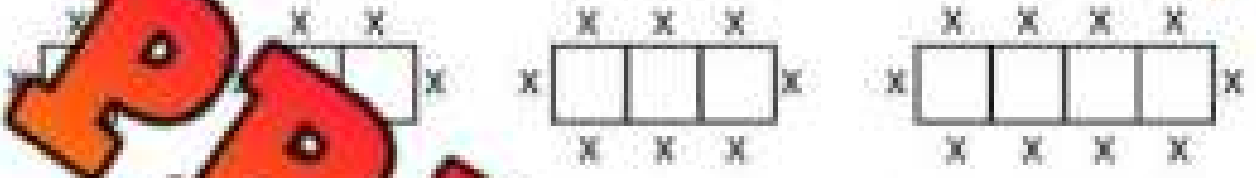
Name: _____ 53

Banquet Word Problem – T-Tables

Challenge Answer the word problem below. Use the T-Table to help.

You have been put in charge of organizing the end of the year banquet for your baseball team. You want to have as many seats as you can.

The diagram below shows how many people can sit at the tables.



a) Fill in the table to learn about the pattern of how many people can attend the banquet.

Tables	1	2	3	5	10	20	50
# of Seats							

b) Write the algebraic expression you used to find the

c) What if you didn't put the tables together? Would 8 tables fit if they were less than 8 tables apart? Draw a diagram to help and fill in the

Tables	1	2	3	4	5	6	20	50
# of Seats	4							

d) Write the algebraic expression you could use to solve any number of tables.

Name: _____ 56

Ice Cream Sundae – Challenge Problem

Challenge Answer the word problem below.

At Kai's Ice Cream Shop, a plain ice cream sundae costs $3.50. Each extra topping costs $0.75.

a) Write an algebraic expression that represents the cost of a sundae with e extra toppi

b) Eli wants a sundae with 6 toppings. How much will it cost?

c) Levi ordered a sundae with toppings. How much will it cost Levi?

d) Levi paid with a $20 bill. How much will he receive back?

e) On Thursdays, sundaes are half price! Write an algebraic expression that represents the cost of a sundae with e extra toppings.

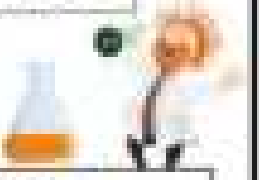
f) Jack ordered a sundae on Thursday with 10 toppings. How much did it cost him?

g) Scarlett ordered 2 sundaes for her and a friend. Both sundaes had 6 toppings each. Write an algebraic expression that represents the cost.

Name: _____ 56

Two-Variable Linear Relationship - Scientist

Challenge Answer the word problem below.



Mrs. Ferraty teaches a grade 8 class. She invited a scientist to join her class to do some experiments with them. The scientist charges $40 for the materials they use for the experiments, plus an additional $3 per student who is in the class.

a) Fill in the table of values below using the linear equation: $y = 3x + 40$

# of Students						
Cost						

b) Graph the table of values

Questions

a) Fill in the missing values in the ordered pairs below:

(25, _____), (50, _____), (100, _____)

(_____, 67), (_____, 85), (_____, 106)

b) If 28 students are in the class, how much money will the scientist earn for their presentation?

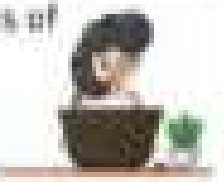
c) If the scientist earned $136, how many students were in the class?

Name: _____ 57

Two-Variable Linear Relationship - Working

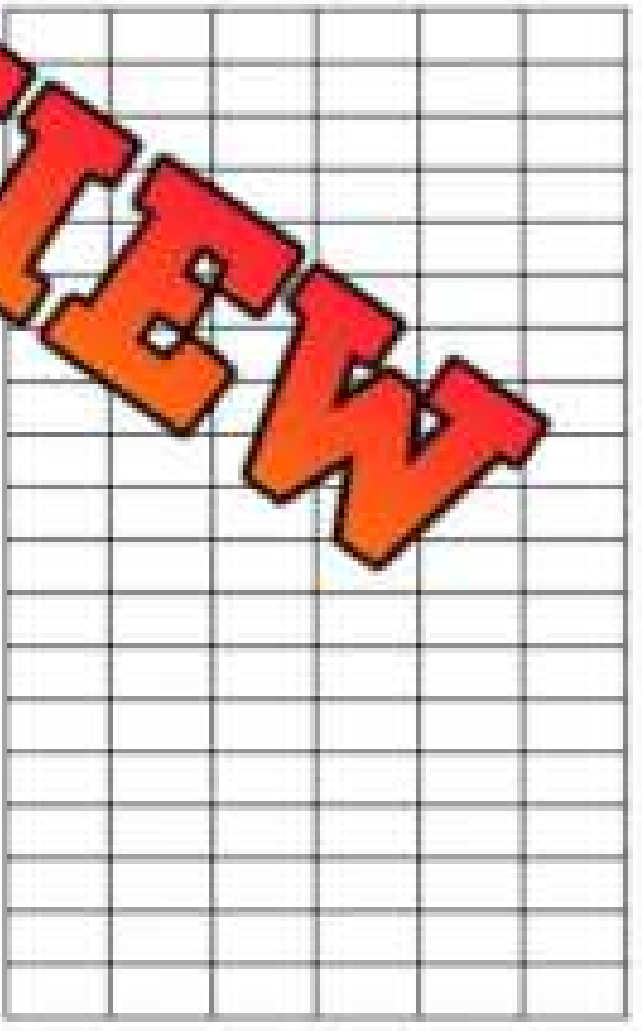
Word Problems | Investigate the relationship between the two-variables.

Stephanie earns $15 for every hour she works. She received a starting bonus of $50 before even working an hour.



1) Fill in the table of values to represent the linear relationship between hours worked and money earned.

2) Graph the table of values.



3) Questions

a) Write the linear equation that represents this situation.

b) Stephanie is scheduled to work 35 hours this week. How much will she earn with her bonus?

c) Fill in the missing values in the ordered pairs below.

(30, _____), (42, _____), (75, _____)

(_____, 320), (_____, 1055), (_____, 3050)

d) Stephanie earned $1580 in her first month of work, including her bonus. How many hours did she work?

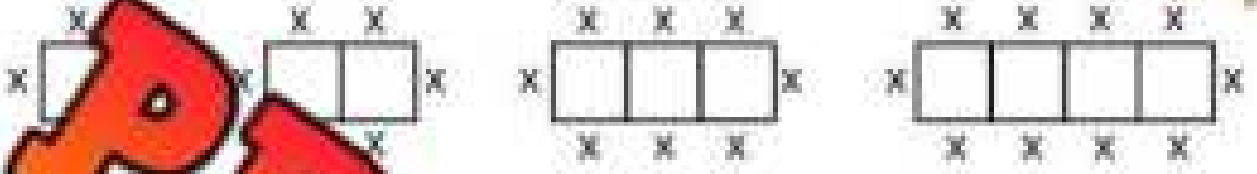
Name: _____ 58

Graphing Linear Equations - Tables

Challenge Answer the word problem below.

You have been put in charge of organizing the end of year banquet for your baseball team. You want to have as many seats as you can.

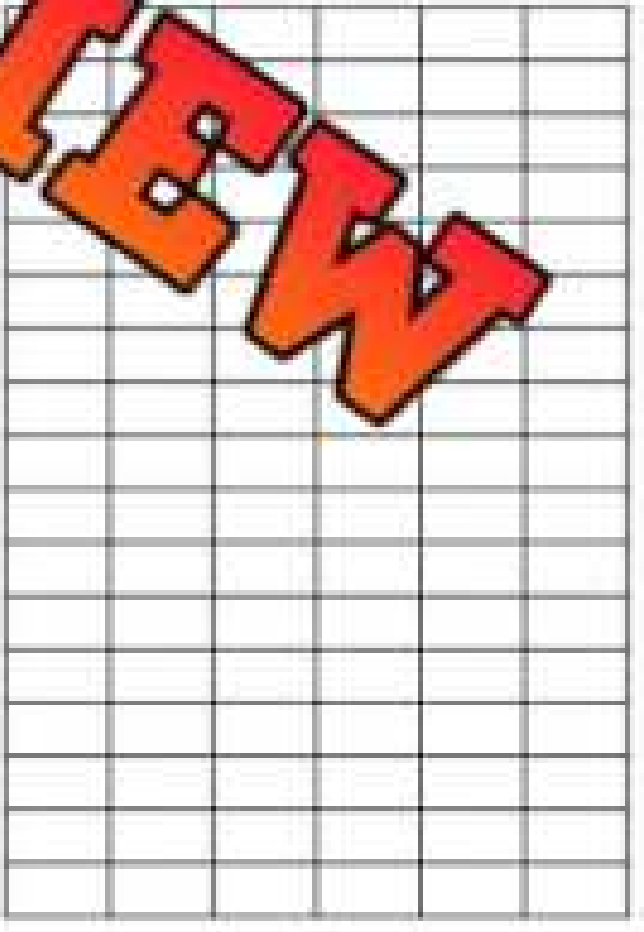
The diagram below shows how many people can sit at the tables.



Fill in the table below to represent the relationship between the number of tables and seats.

Tables (x)			4	5	10	20	50
# of Seats (y)							

Questions	
a)	Write the linear equation that represents this problem.
b)	If you had 61 tables, how many seats would you have?
c)	Fill in the missing values in the ordered pairs below (15, _____), (75, _____), (135, _____) (_____, 132), (_____, 174), (_____, 500)
d)	If you had 100 people attending the banquet, how many tables would you need?



Name: _____ 59

Two-Variable Linear Relationship – Moving Day

Challenge Answer the word problem below.

Aiden's family is moving. They rented a moving truck for $50 a day. They are charged an additional $0.50 for every 1km they drive.

1) Fill in the table of values below.

2) Graph the [illegible]

3) Questions

a) Write the linear equation that represents this problem.

b) If Aiden's family drove 330km in one day, how much would they need to pay?

c) Fill in the missing values in the ordered pairs below.

(15, _____), (75, _____), (135, _____)

(_____, 130), (_____, 240), (_____, 500)

d) Aiden's family owes $660 to the moving company. How far did they drive?

Name: _____ 60

Representing Situations - Division

Part 1 Solve the expressions below using $n = 6$ and $y = 3$

	Expression	Answer
1)	$(7 + 11) \div y$	
2)	$\frac{(n + 3)}{}$	
3)		
4)		

	Expression	Answer
5)	$\frac{(n + y + 6)}{y}$	
6)	$\frac{(9n - n)}{n}$	
7)	$\frac{n}{y}$	
8)	$\frac{(11 + 4)}{y}$	

Part 2 Write an exp in brackets to represent the situations.

1) Gianna and her friends sol bracelet. They divided the earnings up equally amongst her (f) friend

a) Write an expression that represents the situatio

b) If Gianna worked with 2 other friends, how m

2) Zoey made 3 trays of cookies with 12 cookies on each p up equally between (w) number of friends.

a) Write an expression that represents the situation.

b) If Zoey split the cookies with 8 friends, how much would each friend get?

3) Mrs. Hubert has 8 packs of pencil crayons that have 12 crayons inside each pack. She divides the pencil crayons into (g) number of groups.

a) Write an expression that represents the situation.

b) If Mrs. Hubert gave 6 crayons to each group, how many groups did she give to?

Name: _____ 61

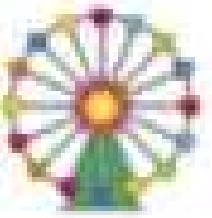
Representing Situations – Organizing a Trip

Challenge Answer the word problem below.

Eli is organizing a trip to Canada's Wonderland. It costs him $50 per ticket and the bus rental is $400 for everyone to split.

a) Write an algebraic expression that represents the cost if p people go.

b) How much would the trip cost Eli if 10 people go?



c) How much would the trip cost if 15 people go?

d) If Eli has 20 people go, how much will it cost each person?

e) Eli wants to offer food as well. Suppose the food costs $10 per person. Write an algebraic expression that represents the cost for the bus, tickets and food if p people go.

f) Suppose 20 people decide to go on the trip and get food. How much will it cost Eli?

g) How much will Eli charge each person if 20 people go and get food?

Name: _____ 66

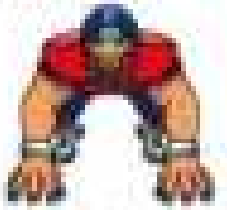
Integer Pattern – Adding Word Problem

-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Instructions Answer the word problem below.

Richard [illegible] football. He plays defense, so he is often running backwards. He decides [illegible] steps forwards and backwards. For every step forward, he adds [illegible] backward, he adds –1.

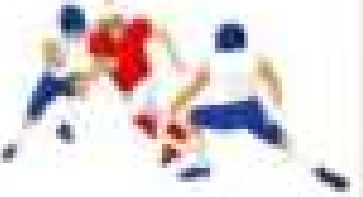
a) [illegible] quarter [illegible] takes 75 steps forwards, and –150 steps backwards. If every st[illegible] step forwards, how many steps did Richard take in the [illegible]?



b) Fill in the table of values that represents how many steps Richard takes in two games (8 quarters).

Term Number (Quarter)							
Term Value (Steps)							

c) Write an algebraic expression to help you solve how many steps Richard took in *n* number of quarters.



d) In 5 games, does Richard take more steps forward or backward?

e) How many steps does Richard take in 5 games?

Name: _____ 70

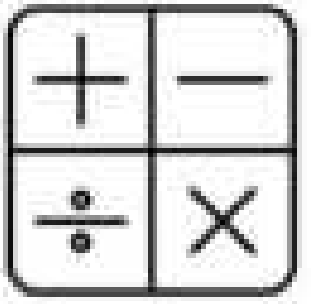
Task Cards: Patterning – All Operations

Objective — What are we learning about?

To recognize and create patterns using the four basic mathematical operations.

Materials — What will you need for the activity?

- 24 t
- [illegible] for answers
- [illegible]



Instructions — [illegible] the activity?

1. Introduce the concept [illegible] operations and their relevance to problem-solving in everyday life.
2. Organize the students into pairs and provide each pair with their sets of task cards.
3. Give each pair an answer recording sheet [illegible] pencils.
4. Encourage teamwork by having students collaborate [illegible] on finding solutions.
5. Allow students to select any task card to begin with, emphasizing that they can complete the cards in any order they prefer.
6. Instruct students to record the letter of their chosen answer (A, B, or C) on their answer sheet beside the task card's number.
7. Consider using a timer to create a dynamic challenge, adjusting the duration to fit the lesson's objectives and complexity.
8. After the activity, review the answers collectively, discussing any challenging patterns and strategies used to solve them.
9. Have students reflect on the activity, sharing the methods they applied and obstacles they overcame.

Name: ______________________ 71

Task Cards | Cut out the task cards below.

Card 1:
Start with 70. Subtract 30 and then add 10 for the next number. What is the second number?

a) 40
b) 50
c) 60

[illegible]
Begin with 90 [illegible] divide by 5 for the next [illegible] What [illegible] rd [illegible]?

a) 22
b) 26
c) 8.4

Card 3:
Begin with 100. Subtract 40 and then multiply by 2 for the next number. What is the fourth number?

a) 20
b) 240
c) 120

Card 4:
Start with 30. Multiply by 3 and then subtract 15 for the next number. What is the fifth number?

a) 1260
b) 75
c) 1830

Card 5:
Start at -20, add 15 each time. What is the third number?

a) 10
b) -5
c) 20

Card 6:
Start with -35. Multiply by 3 and then add 20 for the next number. What is the second number?

a) -85
b) -105
c) -55

[illegible]
Sta[illegible] d then add 12 for the [illegible] ber. [illegible] the second [illegible]

a) [illegible]
b) 24
c) 16

Card 8:
Begin with 180. Divide by 6 and then subtract 10 for the next number. What is the second number?

a) 10
b) 20
c) 25

Name: _____ 73

Task Cards | Cut out the task cards below.

Card 17:
Start with 45. Add 25 and then subtract 30 for the next number. What is the sixth number?

a) 40
b) 25
c) 20

Card 21:
Start at -25, add 20 each time. What is the seventh number?

a) 100
b) -35
c) 95

Card 18:
Begin with [illegible] then divide by 4 for the next number. What is the second number?

a) 30
b) 25
c) 20

Card 22:
Start with -45. Multiply by 3 and then add 25 for the next number. What is the third number?

a) -110
b) -220
c) -305

Card 19:
Begin with 75. Subtract 35 and then multiply by 3 for the next number. What is the fourth number?

a) 1875
b) 660
c) 255

Card 23:
Start [illegible] and then add 9 for the next number. What is the fourth number?

a) [illegible]
b) 11
c) 19

Card 20:
Start with 50. Multiply by 2 and then subtract 25 for the next number. What is the third number?

a) 75
b) 125
c) 100

Card 24:
Begin with 170. Divide by 5 and then subtract 10 for the next number. What is the second number?

a) 20
b) 24
c) 34

Name: _____ 74

Integer Patterns - Retirement

Instructions Answer the questions below.

Jeremy just retired from his job. He has $350 000 in his bank account to live off during his retirement.

a) If he withdrawals -$25 000 a year for 6 years, how much money will he have

b) [illegible] years.

Year 1	[illegible]	[illegible]	Year 4	Year 5	Year 6	Year 7

c) Write an algebraic exp[illegible] how much money Jeremy will have left for each year (y) [illegible] a negative integer.

d) Jeremy has a pension that pays him +$[illegible] How [illegible] could Jeremy live off his pension and $350 000 if he conti[illegible] a year?

e) Jeremy wants to buy a boat for $120 000 and is hoping his mon[illegible] last for 15 years. Can he afford the boat even with his pension? Write an equation that represents the problem.

f) Now that Jeremy owns a boat, his expenses have gone up. He now withdrawals -$35 000 each year. Can he afford his new lifestyle with his $230 000 and pension for 15 years?

Name: _____ 75

Graphing Linear Equations - Exercise

Instructions Answer the questions below.

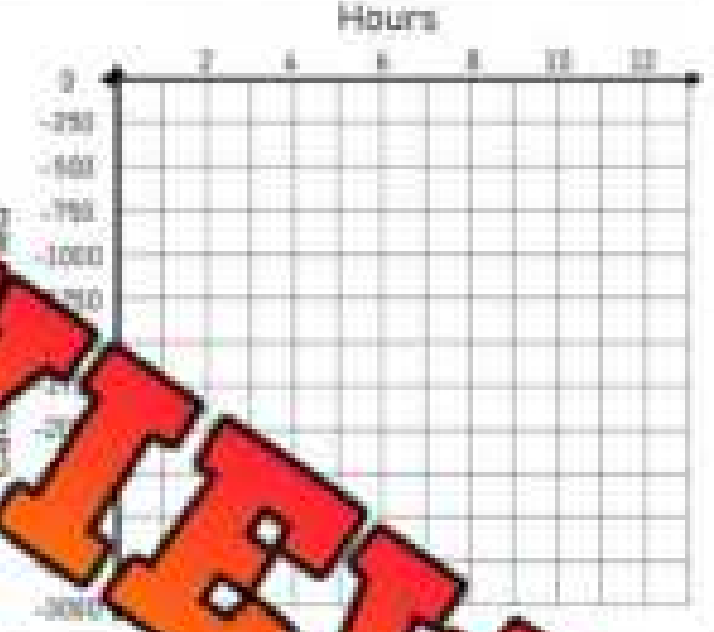
For every 1-hour Logan exercises, he burns 250 calories. Use negative integers to fill in the table of values that tracks Logan's calorie burn.

1-Hour	2-Hours	3-Hours	4-Hours	5-Hours	6-Hours	7-Hours

a) If Logan exercises [illegible] hours a week, how many calories does he burn?

b) Write the linear equation that represents the situation. Use multiplication and a negative integer.

c) If Logan has already burned 750 calories this week, how many more hours will he need to exercise to burn 2250 calories? Write an equation that represents the situation.



d) Describe the [illegible] between the two variables in words.

e) Fill in the missing values in the ordered pairs below

(14, ____), (28, ____), (32, ____)

(____, -4250), (____, -6500), (____, -9750)

Name: _____ 76

Graphing Linear Equations - Advertising

Instructions Answer the questions below

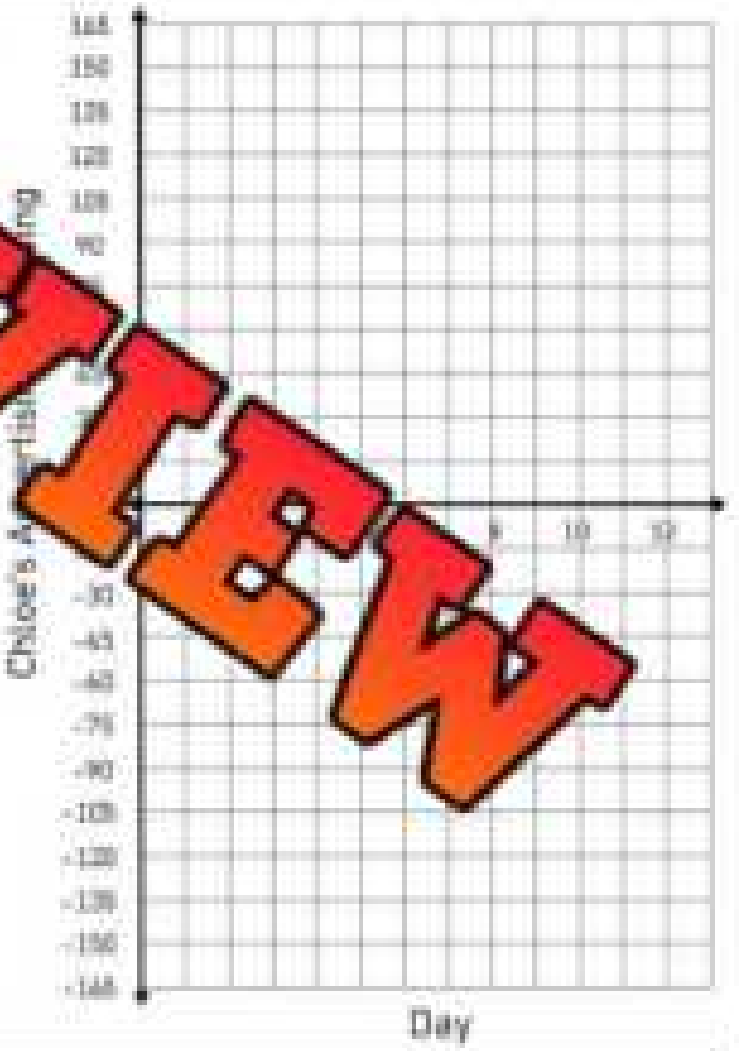
Chloe has an advertising budget of $150. She decides to spend $15 a day. Use negative integers to fill in the table of values that tracks her advertising spending. Display the table of values as a graph as well.

1) After 20 da… will Chloe hav… negativ…

2) Write the linear equation that represents the situation. Use multiplication and a negative integer.

3) Chloe has discovered that she earns $20 a day from people buying her products after seeing her advertisements. Use the numbers/operations below to write a new linear equation that represents the situation.

y *x* -15 20 + =



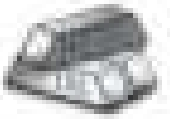
4) Matthew answered the question above using this equation: $y = x(-15) + 20$ but he isn't getting the correct answer. How could he move one bracket to get the correct answer? Why was he wrong before?

Name: _____ 78

Exponential Patterns – Word Problems

Instructions Answer the questions below.

1) Steel in 2021 costs $2 a kg. The prices are expected to double each year for the next 10 years.



a) Fill in the table of values to represent the cost over the next 7 years.

b) [illegible] represents the situation using an exponent and the variable y for [illegible]s.

c) How much will [illegible] cost? Show your work using the expression you wrote above.

2) If one person tells 3 people a message, and each [illegible] another 3 people and those people tell another 3 people [illegible] ding of information. This exponential growth is how things [illegible]

a) Fill in the table to represent how many people rec[illegible] each new level sends the message.

Level	1	2	3		
# of People told the message					

b) Write an expression that represents how many people receive the message if it is spread to (t) levels of people.

c) In the scenario above, how many people would get the message after the message was passed to the 10th level of people?

d) What level of people would spread the message to over 1 million people?

Name: _____ 79

Exponential Patterns – 1 Cent Doubled

Instructions Answer the questions below.

1) $10 or 1 cent doubled daily

a) Which would you rather - $10 today or 1 cent doubled for 10 days. For example, 1 cent on day 1, 2 cents on day 2, and 4 cents on day 3.

b) [illegible] take for the doubling cents to be more than the $10.

2. 1 million dollars or 1 [illegible]

a) Which would you rather - $1 [illegible] cent on day 1, and a doubling of the cents each day for one mon[illegible]ays). [illegible] 1 cent on day one, 2 on day 2, 4 cents on day 3 and so on.

b) How many days would it take for the doubling cents to be more than [illegible]n dollars?

3. Write an algebraic expression that represents this situation using an exponent and the variable n for the number of days.

Name: _____ /10

Exponential Patterns – Power of 10

Instructions Answer the questions below

1) The Richter Scale explains how strong an earthquake is. We categorize earthquakes based on the amount of seismic energy they produce. The Richter Scale is a scale from 1 to 10, but each number represents a power of 10. For example, the Queen Charlotte Islands earthquake in British Columbia reached a magnitude of 8 on the Richter Scale. This means it produced 8×10^8 of seismic energy.

a) An earthquake hit an island once a year for 10 years. The first year it was a 2 on the Richter Scale, the second year, it was a 3 on the Richter Scale and the third year, it was a 4 on the Richter Scale. If this continues with the same pattern, how much seismic energy would be produced after year 10?

b) How much seismic energy was produced after year 10?

2) On average, the Earth is about 4.5×10^8 kilometres from Mars. A spacecraft traveled 1.5×10^7 kilometres per week.

a) Fill in the table of values to represent how far the spacecraft has traveled.

Week	1	2	3	
Distance (km)				

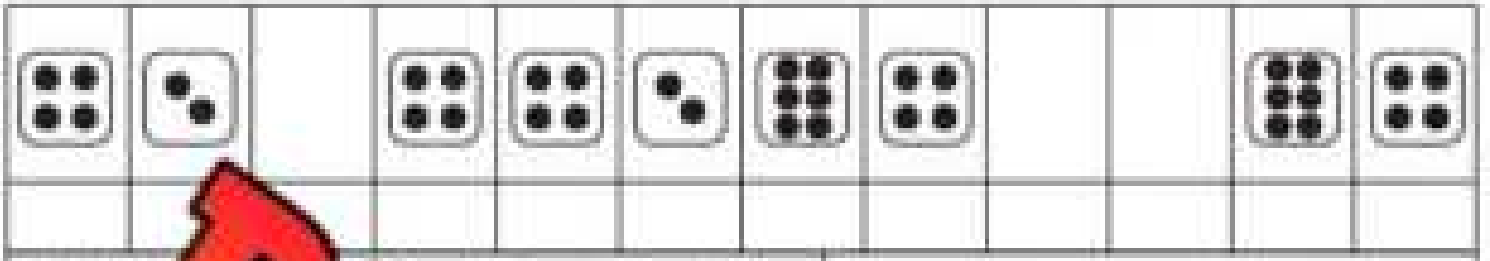
b) How many weeks did it take the spacecraft to reach Mars?

c) How many km did the spacecraft travel to get to Mars and back to Earth?

Name: _____ 81

Algebra Quiz - Patterning

Part 1 Label the A/B patterns below and then extend the pattern.



1) What ... m in the pattern be?	
2) W... the pattern be?	

Part 2 A... block... ch term? Sketch the next 3 terms.

F-1	F-2	F-3	F-4	F-5	F-6

Describe the Pattern Rule						
Figure #	1	2	3	4	5	20
# of Matchsticks						

F-1	F-2	F-3	F-4	F-5	F-6

What is the Pattern Rule?					
Figure Number	1	2	3	4	5
Number of Matchsticks					
How many matchsticks would be in term 18?					

Part 3 — Fill in the tables below to show a constant rate of change.

1) Cole's pay for today has been represented in the table below

Hours Worked	0	1	2	3	4	5	6	7	8
Money Earned ($)	0	27	54	81					

What is the rate of change? _____ Is the rate of change constant? Yes No

2) It costs $[illegible] for admission to an amusement park. Once inside, you pay for each additional [illegible] you go on

Ri[illegible]	1	2	3	4	5
To[illegible]	$31.50	$33.00	$34.50	$36.00	$37.50

a) Write a rule [illegible] it costs to enter the park and go on rides.

b) Write an algebra[illegible]ess[illegible]nts the rule for riding *n* number of rides.

c) How much would it cost [illegible] ri[illegible]

Part 4 — Fill in the input/output tables bel[illegible]

In n	Out $n + 15$
135	
142	
163	
178	

In n	$n + (-$[illegible]
3	
5	
8	
11	

In n	Out $n - 11$
45[illegible]	
488	

In n	Out $3n + 8$
1	
2	
3	
4	
5	

In n	Out $4n + (-8)$
5	
10	
15	
20	
25	

In n	Out $n - (-7)$
-1	
-2	
-3	
-4	
-5	

Part 5 Answer the word problem below.

Nathan drives a car that burns 10 litres of gas every 100km.

a) Use negative integers in the table of values to represent how much gas he uses compared to how far he drives.

Distance (km)							
Fuel (L)							

b) If he [illegible]00km, how many litres of gas would he need?

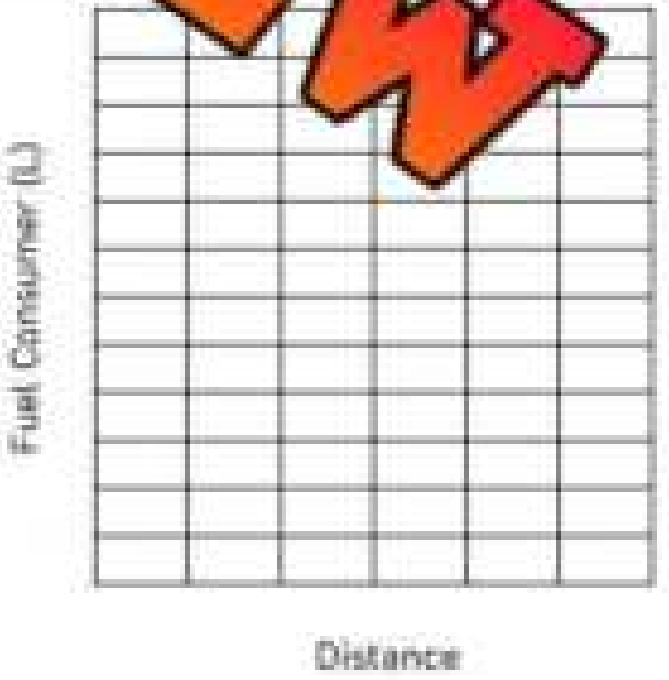
c) Write an algebraic expr[illegible] represents how many litres of gas he needs compared to t[illegible] Use a negative integer.

d) If Nathan drives 550km, how ma[illegible]s of [illegible] need?

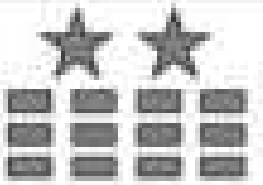
e) Display the data in the graph by using a line g[illegible]

f) Is the pattern a linear pattern? Explain.

g) How many km would he drive to burn 5,000 litres of gas? Show your work by using the expression from above.



Part 6 Draw the 4th and 5th term. Then answer the questions.

Term 1	Term 2	Term 3	Term 4	Term 5
				

Question	Expression
a) Write an expression using the variable r for term number that represents the number of stars in the pattern?	
b) How many shapes will be in the 10th term?	
c) How many shapes will be in the 100th term?	
d) How many rectangles will be in the 10th term?	
e) How many stars will be in the 100th term?	

Part 7 Answer the word problem below.

Admission to an arcade is $5. Each game you play will cost 1 token. Each token costs $1.

a) Fill in the table of values to represent the cost of going to the arcade.

b) Write an expression that represents how much it will cost you to enter the arcade and play (n) number of games.

c) Albert plays 25 games at the arcade. How much did he have to spend?

d) What is the pattern rule?

Grade 8
C2. Equations and Inequalities

	Curriculum Expectations	Pages That Cover the Expectations
C2.1	add and subtract monomials with a degree of 1, and add binomials with a degree of 1 that involve integers, using tools	86 – 101
C2.2	evaluate algebraic expressions that involve rational numbers	102 – 113
C2.3	solve equations that involve multiple terms, integers, and decimal numbers in various contexts, and verify solutions	114 – 152
C2.4	solve inequalities that involve integers, and verify and graph the solutions	153 – 184

Name: _____ 86

What is a Monomial?

A **monomial** is an algebraic expression that has only one term. A **term** is a single mathematical expression. It could be a single number, a single variable, or several variables multiplied together. A term is not numbers or variables added or subtracted.

For example, 2y is a monomial because it is just one term. 2y – 3 is not a monomial because it has two terms: 2y and 3. On the other hand, 2yx is one term because the numbers and variables are multiplied, not added or subtracted. This means 2yx is a monomial. If an expression has 2 terms, it is called a binomial.

Part 1 ...ms does the expression have? Is it a monomial or binomial?

	...on	# of Terms	Monomial or Binomial
1	... + 3y		
2			
3	21 – ...		
4	(12mxy)		
5	3(2x)		
6	15(9ys)		
7	(2x) + (15y)		
8	3(5x) – 2(5ym)		
9	4(5x + 6)		
10	14(3x) – 2(2x)		

Part 2 Write your own monomials and binomials using: 8 y x 6

	Monomial or Binomial	# of Terms	Expression
1	Monomial		
2	Monomial		
3	Binomial		
4	Binomial		
5	Binomial		

Name: _____ 87

What is a Monomial?

Part 1 Add the monomials together

1) 8n + 3n = _____n	2) 11p + 4p = _____p	3) 12t + 14t = _____t
4) [illegible] 3b = _____b	5) 24n + 44n = _____n	6) 34p + 32p = _____p
7) 5y + [illegible] = _____y	[illegible]3n + 28n + 21n = _____n	9) 24x + 39x + 32x = _____x

Part 2 Add the monomials together

1) 7n + 2c + 6c + 8n = _____n = _____c	[illegible] + 9s = _____s [illegible]
3) 12n + 19p + 27p = _____n = _____p	4) 19n + 21c + [illegible] + 11n = _____n = _____c
5) 19s + 24r + 33s = _____s = _____r	6) 23s + 17r + 12s + 24r = _____s = _____r

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Add the monomials together

1)	2) 11q + 7q = _____p
3) 8f + 5c + 7c + 2f = _____f = _____c	
4) 9g + 2k + 3g = _____g = _____k	

Name: _____

Add the monomials together

1) 9s + 3s = _____n	2) 11q + 7q = _____p
3) 8f + 5c + 7c + 2f = _____f = _____c	
4) 9g + 2k + 3g + 8k = _____g = _____k	

Name: _____

Add the monomials together

1) 9s + 3s = _____n	2) 11q + 7q = _____p
3) 8f + 5c + 7c + 2f = _____f = _____c	
4) 9g + 2k + 3g + 8k = _____g = _____k	

Name: _____

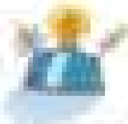
Add the monomials together

1) 9s + 3s = _____n	7q = _____p
3) 8f + 5c + 7c + 2f = _____f = _____c	
4) 9g + 2k + 3g + 8k = _____g = _____k	

Name: ______________________ 90

Simplifying Expressions - Adding Monomials

Questions Simplify the expressions by solving one step at a time



1) 3m + 9m + (7y + 10y) 3m + 9m + 17y 12m + 17y	2) 22s + 3r + 11r + 6s
... 17y	= ______s = ______r
3) ...6n + ... + 36p	4) 16n + 31n + 18c + 27c
= ______n = ______	= ______n = ______c
5) 35s + 12s + 24r + 13r	6) ... + 11r + 19r + 6r + m
= ______s = ______r	= ______s ... m
7) 14y + 19n + 15c + 11c + 25n + 4y	8) 29n + 34y + 1... 28n
= ______n = ______c = ______y	= ______n = ______c = ______y
9) c + 54y + 49b + 52b + 73y + c	10) 73n + 41c + 67c + 24n + 1y + 18y
= ______y = ______b = ______c	= ______n = ______c = ______y

Name: _____ 91

Adding Monomials – Missing Addend

Part 1 What is the value of the missing addend?

1)	3y + 6y = 9y	11)	29y + 13y + ☐ = 56y
2)	11m + ☐ = 19m	12)	☐ + 22t + 36t = 79t
3)	+ ☐ = 27t	13)	33y + 16y + ☐ = 72y
4)	+ 34b	14)	☐ + 21t + 46t = 89t
5)	y =	15)	36y + 23y + ☐ = 87y
6)	15r +	16)	☐ + 27t + 42t = 77t
7)	☐ + 36y =	17)	☐ + 57t + 66t = 109t
8)	46y + ☐ = 52y	18)	+ ☐ = 135y
9)	☐ + 22y = 57y	19)	t = 149t
10)	51b + ☐ = 77b	20)	

Part 2 Write an addition equation using the monomials pro

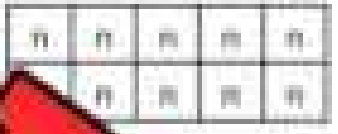
1)	27y 71y 44y	2)	36n 24n 12n
3)	31b 35b 4b	4)	79c 108c 29c
5)	84y 27y 57y	6)	61n 34n 95n

Name: _____ 92

Subtracting Monomials - Tiles

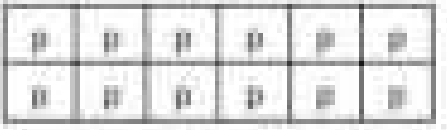
Questions Subtract the monomials by crossing out the tiles you've subtracted.

1) $10n - 3n - 2n$



= _____n

2) $12p - 6p - 2p$

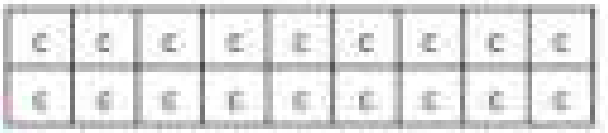


= _____p

3) $17s - 9s$

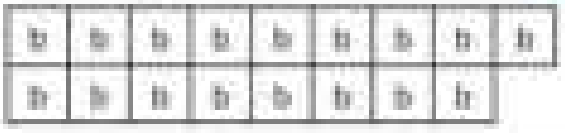
= _____s

4) $18c - 12c - 3c$



= _____c

5) $17b - 9b - 3b$

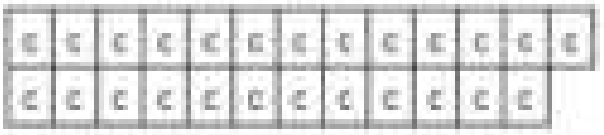


= _____b

6) $22y - 11y - 5y$

= _____y

7) $25c - 8c - 13c$

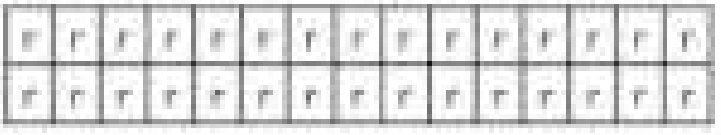


= _____c

8) $26n - 14n - 9n$

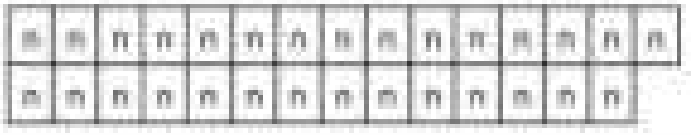
= _____n

9) $30r - 11r - 15r$



= _____r

10) $29n - 16n - 11n$



= _____n

Name: _____ 93

Subtracting Monomials

Part 1 Subtract the monomials.

1) 7n - 2n = _____n	2) 9p - 4p = _____p	3) 15t - 10t = _____t
4) [illegible] 9b = _____b	5) 28n - 14n = _____n	6) 34p - 19p = _____p
7) [illegible] = _____y	8) 52n - 34n - n - 11n = _____n	9) 57y - 12y - 7y - 9y = _____y
10) 33n - 11n - 11n = _____n	11) [illegible] 14y = _____y	12) 94a - 25a - 21a - a = _____a

Part 2 What is the value of the missing a[illegible]?

1)	15y - [6y] = 9y	8)	1[illegible]
2)	18m - [ ] = 1m	9)	[ ] - 7t [illegible] 18t
3)	25t - [ ] = 17t	10)	58y - 14y - [ ] = 17y
4)	39b - [ ] = 24b	11)	[ ] - 13t - 26t = 29t
5)	[ ] - 22y = 31y	12)	76y - 13y - [ ] = 41y
6)	45r - [ ] = 23r	13)	[ ] - 21t - 32t = 46t
7)	[ ] - 31y = 19y	14)	[ ] - 68t - 56t = 49t

Name: _____ 94

Adding and Subtracting Monomials

Follow these steps to simplify the expressions below
1) Identify like terms (terms with the same variable)
2) Rearrange terms so that the like terms are together
3) Combine like terms

$6m + 8y - 3m - y$
$6m - 3m + 8y - 1y$
$3m + 7y$

Questions Simplify the expressions by solving one step at a time.

1) [illegible] 2m – 11m	2) 12n + 14n – 17n + n
= _____n	= _____n
3) 15s – 3r	4) 2n – c + 13n – 21c
= _____s = _____r	= _____n = _____c
5) 13s + 12r – 14s – 13r	6) [illegible] 2r + 6r
= _____s = _____r	= _____s
7) 15m + 7y – 3m – 3y	8) 23n – 18p – 17n – 15p
= _____m = _____y	= _____n = _____p
9) 18s – 33r + 15r – 22s	10) 22n – 53c – 33n + 21c
= _____s = _____r	= _____n = _____c

Name: _____ 96

Distributive Property - Addition

The distributive property is used to make difficult problems simpler. It means that when we multiply a number by the sum of two or more addends, we get the same result as multiplying each addend separately by the number.

You can use the distributive property of multiplication to rewrite expressions that have a number outside of a parenthesis.

Example 1

7(5 + 3)
7 × 5 + 7 × 3
35 + 21
56

7	5	3
	35	21

Example 2

4(y + 8)
4 × y + 4 × 8
4y + 32

4	y	8
	4y	32

Evaluate

Fill in the boxes to represent the distributive property of the expressions.

1) 9(4 + 6)

2) 6(3 + n)

3) 8(7 + 3)

4) n(

5) 6(f + 11)

6) -3(5 + p)

Expand

Evaluate the expressions below.

1) 9(t + 7)	2) -2(8 + 12)	3) -6(s + 3)
4) 8(y + 4)	5) 5(-11 + n)	6) -4(-12 + k)

Name: _____ 98

Distributive Property – Equivalent Expressions

Match Write the letter from column 2 beside the equivalent expression from column 1.

1

Answer	Column 1	Letter	Column 2
	3(9 – 5)	a	15 + 27
	-3(9 + 5)	b	(-15) + 27
	3(5 + 9)	c	3 x 9 – 3 x 5
	-3(5 – 9)	d	(-27) + (-15)

2

Answer	Column 1	Letter	Column 2
		a	-63 – 7t
		b	7t + 63
	7(t + 9)	c	-7t + 63
	-7(t – 9)	d	63 – 7t

3

Answer	Column 1	Letter	Column 2
	8(11 – n)	a	
	-8(n + 11)	b	
	8(11 + n)	c	
	-8(11 – n)	d	88 + 8n

4

Answer	Column 1	Letter	Column 2
	3(y – 5)	a	3y + 15
	-3(y + 5)	b	-3y + 15
	3(y + 5)	c	3y – 15
	-3(y – 5)	d	-3y – 15

Name: _____ 102

Mixed Operations - BEDMAS

When solving an equation, you need to follow the order of operations. This means you have to solve the equation in the correct order, not just from left to right. Using BEDMAS helps us remember the order to solve.

1. Brackets 2. Exponents 3. Division or Multiplication (whichever is first) 4. Addition or Subtraction (whichever is first)

Example 1
2 + (
2
n = 1

Example 2
n – (2 x 3) = 4
n – 6 = 4
= 10

Example 3
8 – (4n) = 20
8 – 7 x 4 = 20
n = 7

Part 1 Which o you first?

1) 3 + (4 x 5) = n	2) 21	3) (8 x 4) + (4 ÷ 2) = t
4) n + (12 ÷ 6) = 12	5) 12 ÷ (2 + 1	2 = 8

Part 2 Alex and Avery both answered the questions below. Circle who's right.

	Question	Alex's Answer	Avery's Answer
1	2 + 6 x 4 + 12	44	38
2	10 – 2 x 3	4	24
3	9 – 3 x (2 + 1)	0	18
4	5 x 3 + 8 ÷ 2	19	11
5	12 ÷ 3 x (5 + 5)	25	40

Name: _____ 103

Writing Algebraic Expressions

Using algebraic expressions helps us understand mathematical situations. We can use a variable to replace a changing number, like how many tickets are sold to a game – $t \times 10$

Part 1 Write each algebraic expression in words
Use the words, "a number" in place of the variable

1) $9 - t$

Nine sub[illegible]

2) n

3) $6 \cdot b$

4) $12r$

5) $\frac{t}{8} + 5$

6) $9 - t + 21$

7) $\frac{21}{y} + 13$

8) $(8b) - (Ax)$

Part 2 Write an algebraic expression for each sta[illegible]

1) Twelve times a number subtract eight

2) Divide a number by seven and multiply it by a different number

3) A number is subtracted by fourteen divided by five

4) Triple a number subtracted by double a different number

5) Divide eighty by a number, then multiply by four

Name: _____ 105

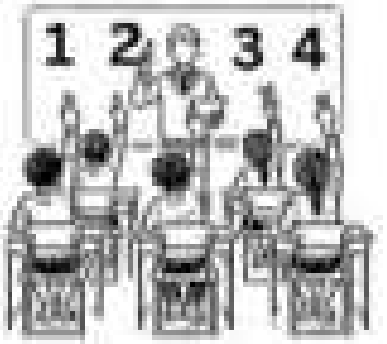
Finger Signals Quiz - Understanding Algebraic Expressions

Objective What are we learning about?

Students will reinforce their understanding of algebraic expressions through an interactive finger signals quiz.

Materi- ...ll you need for the activity?

- A list of ...



Instructions How ... ...ivity?

1. Prepare a list of questions with ... ...labeled A, B, C, and D.
2. Explain the finger signals for each ans... ...ice: ...or A, two fingers for B, three fingers for C, and four finger...
3. Inform the students they will show their answer ... ...when you read each question.
4. Read the first question aloud clearly and repeat if necessary.
5. Give students a few moments to think about their answer and decide independently.
6. After a countdown (e.g., "3, 2, 1"), have all students show their answer simultaneously by raising the appropriate number of fingers.
7. Reveal the correct answer and explain why it is correct.
8. Repeat with different questions to reinforce understanding of algebraic expressions.

Name: ______________________ 10h

Question	A	B	C	D
A student reads r pages each day for 6 days. What is the total number of pages read?	6 + r	6 − r	6r	r ÷ 6
A photographer takes p photos, takes 4 more each day for 6 days, and then deletes 8. How many photos are there now?	p + (4 × 6)	(p + 24) − 8	p + 24	p + (4 × 6) − 8
A farmer has f cows, buys 18 more, and sells 7. How many cows are there now?	f + 18 − 7	f + 18 − 7	f + 18 + 7	f + 18 − 7
A librarian shelved 40 books over the course of h hours. Wh[illegible] average number of books shelved per [illegible]	40 + h	40 − h	40h	40 ÷ h
A farmer [illegible] row and has 6 rows. [illegible] trees?	6 + f	6 − f	6f	f ÷ 6
A worker [illegible] w dol[illegible] 7 hours. What is the total [illegible]	7 + w	7 − w	7w	w ÷ 7
A library has b bo[illegible] more, [illegible] loses 20. How many [illegible]	b + 50 − 20	b + 50 − 20	b + 50 + 20	b + 50 − 20
A factory produces p produ[illegible] days. What is the total product[illegible]	[illegible]	10 − p	10p	p ÷ 10
A librarian has b books, receives 7 m[illegible] hour for 8 hours, and then donates 10. How many books are there now?	[illegible]	[illegible] − 10	b + (7 × 8)	b + 7 × 8 − 10
A runner runs 40 kilometres over the course of d days.	[illegible]	[illegible]	40d	40 ÷ d
A school has s students but loses 20. What is the total number of students?	s + 20	[illegible]	[illegible]	s ÷ 20
A gardener has g plants, plants 5 more each day for 3 days, and then removes 4. How many plants are there now?	(g + 15) − 4	g + 1[illegible] − 4	[illegible]	[illegible] 3)
A chef cooked 120 meals over the course of m days. What is the average number of meals cooked per day?	120 + m	120 − m	120[illegible]	120 ÷ m
A baker makes b batches of cookies each day for 4 days. What is the total number of batches?	4 + b	4 − b	4b	b ÷ 4
Sarah has s apples and buys 5 more. How many apples does she have now?	s + 5	s − 5	5s	s ÷ 5
A store has k kites but sells 30. What is the total number of kites left?	k + 30	k − 30	30k	k ÷ 30
An artist has p paintings, paints 2 more each day for 5 days, and then sells 6. How many paintings are there now?	a + (2 + 5)	(a + 10) − 6	a + (2 × 5)	a + (2 × 5) − 6

Evaluating Algebraic Expressions - Addition

Part 1 Evaluate the following expressions for $x = -7$

1) $x + 13$	2) $9 + x$	3) $25 + x$	4) $x + 17$
5) 39 [illegible]	6) $83 + x$	7) $74 + x + 11$	8) $87 + x + 24$

Part 2 Evaluate the following expressions for $y = -7$ and $n = 4$

1) $n + y$	2) [illegible] y	3) [illegible] $y + n$	4) $y + 18 + n$
5) $54 + y + n$	6) $n + (y + 20)$	7) [illegible]	8) [illegible] $+ n + (y + 4)$

Part 3 Evaluate the following expressions for $x = -5$ and $p = -1$[illegible]

1) $(x) + (p) - 23$	2) $17 + x + (p)$	3) $(19 + x) + (p)$	4) $x + (35 + p)$
5) $(p + 27) + x$	6) $x + 49 + (p)$	7) $(x + 63) + (p)$	8) $88 + p + x$

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Evaluate the following expressions for x = -5 and p = -12

1) (19 + x) + (p)

2) x + (35 + p)

3) (x) + (p) − 23

Name: _____

Evaluate the following expressions for x = -5 and p = -12

1) (19 + x) + (p)

2) x + (35 + p)

3) (x) + (p) − 23

Name: _____

Evaluate the following expressions for x = -5 and p = -12

1) (19 + x) + (p)

2) x + (35 + p)

3) (x) + (p) − 23

Name: _____

Evaluate the following expressions for x = -5 and p = -12

1) (19 + x) + (p)

2) x + (35 + p)

3) (x) + (p) − 23

Name: _____ 109

Evaluating Algebraic Expressions - Subtraction

Subtraction Integers Rules

To subtract integers, it is easiest to change the operation to addition and then follow the addition rules. We can do this by using the rule – Keep, Flip, Change. We keep the first number the same, flip the operation from subtraction to addition, and then change the third number's sign.

Example: 5 – (-6) = ? becomes 5 + 6 = 11

Keep the first integer | **Flip** the operation | **Change** the sign of the next integer

Part 1 Ev… …ow… …pressions for x = -8

1) $x - 15$	…	27 – x	4) $x - 31$
5) $47 - x$	6) $61 - x$	…	8) $94 - x - 14$

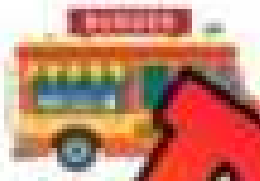
Part 2 Evaluate the following expressions for y = -12 and n = -5

1) $y - n$	2) $(16 - n) - y$	3) $15 - (y - n)$	4) $y - 11 - n$
5) $21 - y - n$	6) $(n - y) - 36$	7) $y - (n - 43)$	8) $(28 - n) - y$

Name: _____ 110

Evaluating Expressions – Food Truck

Walker works at a food truck selling burgers, hot dogs, fries, and pogos. He uses algebraic expressions to determine the cost of his customer's orders.



Menu	
Burger (b)	$4.50
Hot Dog (h)	$2.75
Fries (f)	$3.25
Pogo (p)	$1.50

Solve. Write an algebraic expression and then evaluate using the menu prices.

Customer Order	Expression	Answer
1) 2 burgers, 1 fry	$2 \times b + f$ $(2) + 3.25$	
2) 4 hot dogs, 2 pogos		
3) 5 fries, 2 pogos		
4) 3 burgers, 2 fries, 2 pogos		
5) 3 fries, 5 burgers, 4 hot dogs		
6) 10 burgers, 10 fries		
7) 5 hot dogs, 7 fries, 3 pogos		
8) 4 burgers, 9 hot dogs		

Name: _____ 112

Evaluating Algebraic Expressions – (x ÷)

Part 1 Evaluate for x = -3. Use brackets to separate the numbers.

1) $7x$	2) $6x$	3) $4x - 5$	4) $12x + 7$
5) 17	6) $15x - 10$	7) $8x - x$	8) $13x + 6 - x$

Part 2 Evaluate these expressions for y = -8

1) $\frac{y}{2}$	2) $\frac{16}{y}$		4) $\frac{y}{2} + 5$
5) $\frac{48}{y} + 7$	6) $\frac{88}{y} + y$	7) $\frac{}{y}$	y

Challenge! Use three -5s and any operation or brackets to write an expression with the values provided.

	Your Expressions	Value
1)		-125
2)		-5
3)		0
4)		50

	Your Expressions	Value
5)		5
6)		30
7)		20
8)		-6

Name: _____ 117

Matching Game: Do The Equations Match?

Objective What are we learning about?

To enhance students' understanding of equivalent equations. Students will identify and match pairs of equations that yield the same result, fostering critical thinking and prob[illegible]lving skills in a collaborative group setting.

Mat[illegible] [illegible]ou need for the activity?

- Pre-prepa[illegible] re-c[illegible] cards
- Small bags or envel[illegible]d t[illegible]s for each group

Instructions How will you complete the [illegible]

1. Before the class, the teacher will cut out the p[illegible]d [illegible]g game cards.
2. Divide the students into small groups and give each group [illegible]ope containing a set of the matching cards.
3. In their groups, students will spread out the cards face down on their table.
4. Each person takes a turn to try to match two cards. They will need to solve both equations to see if they match (equal the same).
5. If they find a correct match, they keep the cards out and continue with their next turn. If the cards don't match, they turn them back over in the same place, and the next player takes a turn.
6. The activity continues until all pairs are correctly matched within each group.

Name: _____ 118

Cards | Matching Game Cards

60 + (-15) + 20	55 - (-10)
15 - 5	100 + (-25)
90 + (-20) + 12	62 + 30
-104 + 151 + 112	366 - 150 - 57
20 + 180	250 - 50

Name: _____ 121

Cards | Matching Game Cards

98 + (-43)	75 + 20 - 40
[illegible]	290 − 99
89 - 49 + 18	[illegible] + 14
-83 + 249	199 + (-66) + 33
77 - 25 + 12	40 + 24 - 0

Name: _____ 122

Finding The Value of a Variable

When we write an algebraic expression with an equal sign, it becomes an equation. An equation is a statement that two expressions are equal.

We can solve for a variable by balancing an equation, making sure both sides of the equal sign have the same value.

Part 1 Find out the value of the variable.

n =	2) n + 15 = 29 n =	3) 36 − n = 28 n =
4) 45 − 1[illegible] p =	[illegible] = p = 62 p =	6) p − 13 = (−25) p =
7) 13 − y = (−10) y =	8) [illegible] y =	9) (−32) − 15 = y y =
10) 27 + t = (−12) t =	11) 36 − t = [illegible] t =	[illegible] + t = (−49) t =

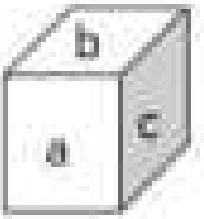
Part 2 The formula for calculating the surface area of a rectangular pr[illegible] add the areas of each side together.

Use the following equation to find the surface area (s) of a rectangular prism:

s = a + a + b + b + c + c or s = 2a + 2b + 2c

1) a=6 b=11 c=10	SA=
2) a=9 b=14 c=21	SA=
3) a=11 b=21 c=25	SA=

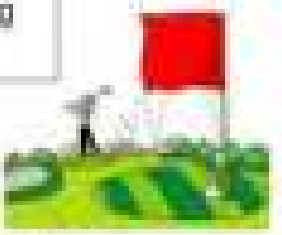
4) a=26 b=15 c=41	SA=
5) a=35 b=32 c=49	SA=
6) a=29 b=19 c=52	SA=



Name: _____ 12A

Addition Equations – Golf Tournament - Challenge

Zack hosted a 4-round golf tournament. He has the results and needs to find out who won the tournament. The leaderboard is below but is missing numbers.



Directions Fill in the leaderboard.

Player	Round 1	Round 2	Round 3	Round 4	Final Score
[illegible]		-6	4	-5	
Charlie		-2	5		-5
Dominic				9	-6
Kayden	-3	-7	-1	-5	
Silas	5	3			-1
Lillian	5	8			9
Brooklyn	-4	-2			-5
Natalie		7	2	-5	-4
Andrew	-5	4	1		
Santiago		-3	-8		-22

Results Who won the golf tournament?

1) Who won the golf tournament?	
2) The entry fee for the tournament was $75. All the money went to the prize (p). Write an equation that determines the value for (p).	
3) More golfers joined the tournament. The prize ended up being $1125. Write an equation that determines how many golfers (g) participated in the tournament.	

Name: _____ 127

Integer Patterns – Average Temperatures

Directions Answer the questions below.

6 friends participated in a 4-round golf tournament. The table below shows what each friend scored.

Player	Round 1	Round 2	Round 3	Round 4	Final Score
Kylie (k)	-3	-5	+4	-4	
Finn (f)	-3	+2	+5	-6	
Maggie (m)		-3	+1	+7	
Dawson (d)		-9	-2	-4	
Zayn (z)			-8	+5	
Leon (l)			-6	+4	

a) Fill in their final scores.

b) Write an equation that shows the difference between Finn's (f) final score and Zayn's (z) final score. Use the variable before you solve.

c) Suppose Kylie and Maggie played on a team against Dawson. Write an equation that shows the difference between their team scores.

d) Suppose Dawson and Zayn were on a team against Leon and Maggie. Write an equation that shows the difference between their team scores.

e) Suppose Kylie, Finn, and Maggie played on a team against Dawson, Zayn, and Leon. Write an equation that shows the difference between their team scores.

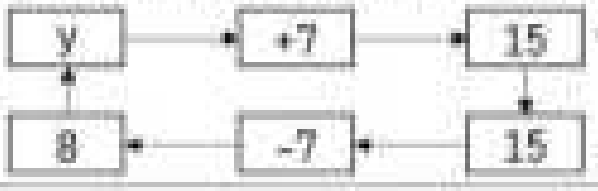
f) Use the variables *b* for best round and *w* for worst round to write an equation that finds the difference between the best and worst players.

Name: _____ 128

Adding and Subtracting Equations – Flow Chart

We can use a reverse flow chart to calculate the value of a variable in an equation.

Example: $y + 7 = 15$



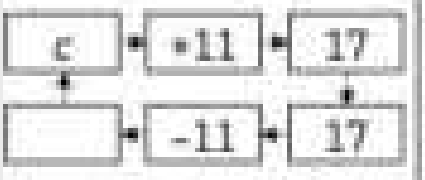
- Equation represented the same
- Use the opposite operation in the middle and solve for the last box

Direction Use the flow chart to find the value of the variable.

1) $t - 7 = 12$

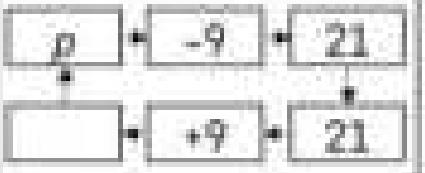
2) $r - 9 = 16$

3) $c + 11 = 17$

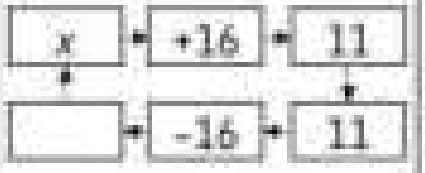


4) $b + 12 = 5$

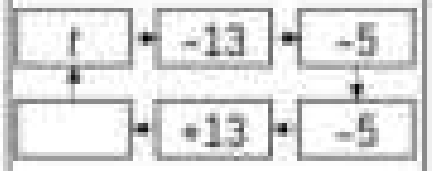
5) $p - 9 = 21$



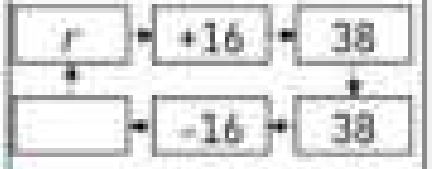
6) $x + 16 = 11$



7) $t - 13 = -5$



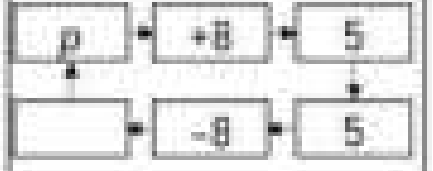
8) $r + 16 = 38$



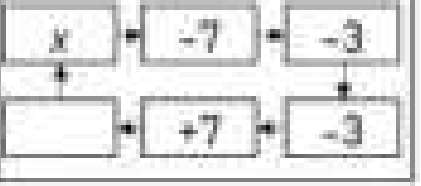
9)

10) $b + 14 = 31$

11) $p + 8 = 5$

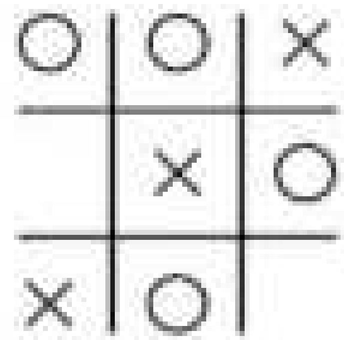


12) $x - 7 = -3$



Math Tic-Tac-Toe: Balance The Equations

Objective What are we learning about?



To help students practice solving and balancing equations involving variables in a fun and interactive way thro[illegible] Tic-Tac-Toe game.

Mate[illegible] [illegible] you need for the activity?

- Tic-Tac-[illegible]ards [illegible]ded

Instructions How w[illegible]ple[illegible]ity?

1. Find a partner to play the gam[illegible]
2. The goal is to solve and balance the al[illegible] eq[illegible]h square to place your marker (X or O).
3. One player will be "X" and the other will be "O".
4. Take turns choosing a square and solving the equation in [illegible] find the value of the variable.
5. Write down the solution below the equation and place your marker (X or O) in the square.
6. If a player chooses a square and solves the equation incorrectly, they do not get to place their marker in that square. The other player gets a chance to solve it correctly and place their marker.
7. The first player to get three markers in a row (horizontally, vertically, and diagonally) wins the game. Continue playing with different tic-tac-toe grids on the sheet.

Name: ______________________ 125

Tic-Tac-Toe Use the following tic-tac-toe grids for the game.

96 ÷ ___ = 16	(-12) x ___ = 60	___ ÷ 6 = 12
(-42) x ___ = 84	48 ÷ (-8) = ___	___ x 5 = 35
180 ÷ ___ = [illegible]	[illegible] x (-6) = ___	___ ÷ 9 = (-9)

128 ÷ ___ = 16	(-18) x ___ = 72	___ ÷ 4 = 8
(-36) x ___ = 108	75 ÷ (-15) = ___	___ x 6 = 36
110 ÷ ___ = (-11)	(-25) x (-8) = ___	___ ÷ 10 = (-6)

192 ÷ ___ = 16	[illegible]	[illegible]
(-30) x ___ = 90	54 ÷ (-6) = ___	___ x 12 [illegible]
200 ÷ ___ = (-10)	(-44) x (-3) = ___	___ ÷ 2 = (-10)

72 ÷ ___ = 9	(-15) x ___ = 60	___ ÷ 4 = 10
[illegible]	80 ÷ (-8) = ___	___ x 14 = 98
[illegible]	[illegible]	___ ÷ 6 = (-8)

48 ÷ ___ = 8	(-21) x ___ = 105	___ ÷ 7 = 9
(-16) x ___ = 48	60 ÷ (-10) = ___	___ x 11 = 88
72 ÷ ___ = (-6)	(-40) x (-4) = ___	___ ÷ 3 = (-8)

64 ÷ ___ = 16	(-20) x ___ [illegible]	___ ÷ 8 = 5
(-28) x ___ = 56	100 ÷ (-25) = ___	___ x 7 = 28
90 ÷ ___ = (-9)	(-36) x (-2) = ___	___ ÷ 12 = (-6)

Name: _____ 136

Finding The Value of a Variable

When we multiply a number by a variable, we do not need to use the multiplication sign. It is known that any variable next to a number means the operation we are using is multiplication.
Example: $7n = 14$ means $7 \times n = 14$
We can figure out the unknown number by balancing the equation: $n = 2$

Part 1

Find out the value of the variable.

[illegible]	2) $(-4n) = 16$ $n =$	3) $(-9s) = 54$ $s =$
[illegible]	5) $\frac{-77}{p} = -11$ $p =$	6) $\frac{-28}{k} = -7$ $k =$
7) $(-3n) = (-$ $n =$	[illegible] (-42)	9) $\frac{n}{8} = -9$ $n =$
10) $\frac{-40}{5} = n$ $n =$	1[illegible]	12) $\frac{p}{10} = -5$ $p =$
13) $(-8n) = 96$ $n =$	14) $\frac{110}{n}$ $n =$	15) $7d = 56$ $d =$

Part 2

Calculate the area of a circle and a triangle [illegible]

The formula for calculating the area of a circle is: A [illegible] $= 3.14$
Calculate the area in the questions below using the values for radius and pi

	Radius	Area – Circle
1)	r = 9cm	A =
2)	r = 6cm	A =

	Radius	Area – Circle
3)	r = 12cm	A =
4)	r = 7cm	A =

	Radius	Area – Circle
5)	r = 13cm	A =
6)	r = 11cm	A =

The formula for calculating the area of a triangle is: $A = \frac{(b)(h)}{2}$

	b	h	Area – Triangle
1)	6	2	A =
2)	9	6	A =

	b	h	Area – Triangle
3)	8	4	A =
4)	7	5	A =

	b	h	Area – Triangle
5)	3	4	A =
6)	8	6	A =

Name: _____ 137

Writing Multiplication Equations – Gas Station

Tyler works at a gas station. He sells fuel by the litre, chips, drinks, and chocolate bars.

Fuel (f)	Chips (c)	Drinks (d)	Chocolate Bars (b)
$1.33/L 	$1.75 	$1.25 	$1.99 

Instructi Complete the table below. The first one is done for you.

#	f	c	d	b	Equation	Answer
1	20	2	0		20f + 2c	t = 20 x 1.33 + 2 x 1.75 t = 26.6 + 3.50 t = $30.1
2	50	0	3	2		
3	0	2	1	0		
4	60	1	2	2		
5	0	2	0	0		
6	0	1	1	0		
7	25	2	1	2		
8	70	0	1	3		

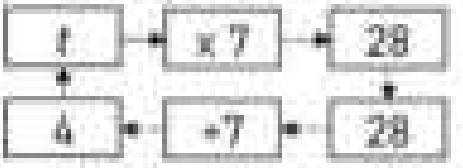
Name: _____ 142

Multiplying Equations – Flow Chart

Steps to fill in a flow chart:

1) Write the variable in the first box
2) Write the second value in the second box
3) Write the answer in the third box
4) We are working in reverse now. Write the answer in the first box
5) We d[illegible] opposite to the next box as we did with the second box
6) Fill i[illegible] box to find the value of the variable, which it points to

Example: $7t = 28$



Direc[illegible] blanks in the flow chart.

1) $7t = 28$		6) $12t = -84$	
2) $3r = 15$		7) -5[illegible]	
3) $-9c = 36$		8) $-7c = 63$	
4) $-6b = -42$		9) $-12b = -132$	
5) $8p = -72$		10) $-9n = 63$	

Name: _____ 145

Writing Division Equations - Investments

An investment club is a group of investors who pool their money to make investments. Each member of the group helps study new investment opportunities. When an investment earns money, they split the earnings. When an investment loses money, they split the losses.

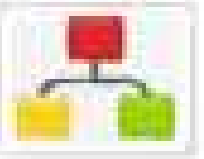
Instructions: Use a formula to find out the balance for each person in the club.

#	Investment	# of People in the Club (n)	Formula	Answer
1	$400 loss	8	$\frac{i}{n} = t$	$\frac{-400}{8} = -50$
2	$600 gain			
3	$800 loss	5		
4	$1200 loss	8		
5	$ 750 gain	5		
6	$5000 gain	20		
7	$2500 loss	25		
8	$3600 loss	24		
9	$12500 gain	5		
10	$8000 gain	40		
11	$6800 loss	17		
12	$25000 loss	20		
13	$84000 gain	16		

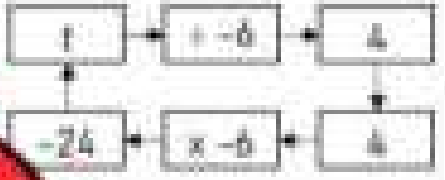
Name: _____ 146

Division Equations – Flow Chart

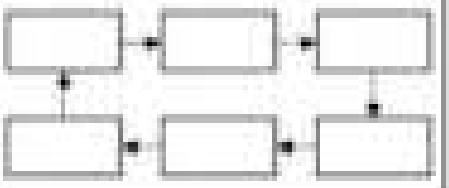
Directions Fill in the blanks in the flow chart.



1) $\frac{t}{-6} = 4$

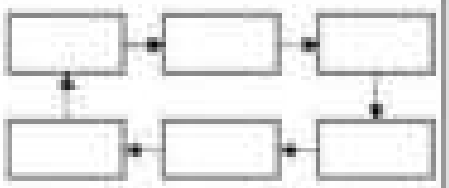


7) $\frac{t}{m} = -4$

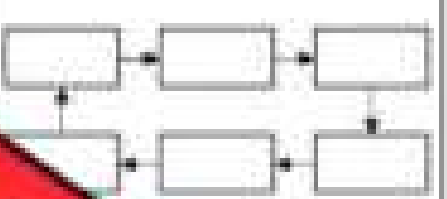


2) $\frac{r}{-7} = 8$

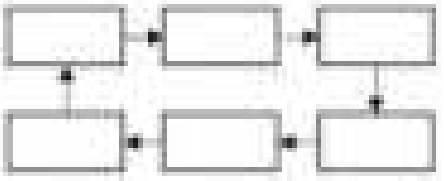
8) $\frac{r}{-12} = 9$



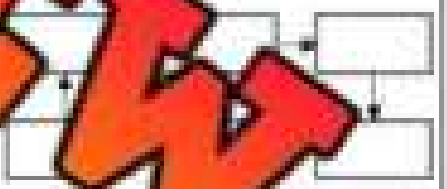
3) $\frac{c}{4} = -7$



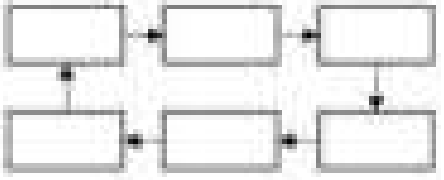
4) $\frac{b}{11} = 6$



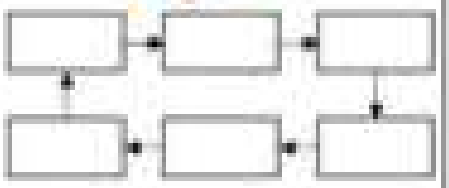
10) $\frac{b}{-15} = 4$



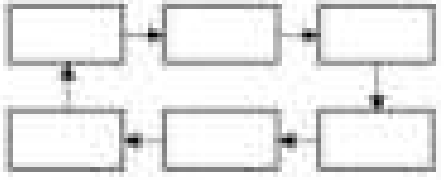
5) $\frac{p}{-7} = -12$



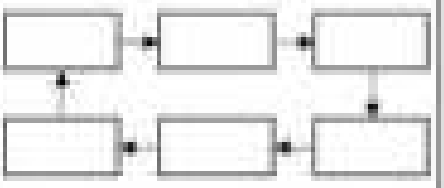
11) $\frac{p}{n} = 12$



6) $\frac{n}{-2} = -33$



12) $\frac{n}{-13} = -6$



Name: _____ 148

Mixed Operations - BEDMAS

When solving an equation, you need to follow the order of operations. This means you have to solve the equation in the correct order, not just from left to right. Using BEDMAS helps us remember the order to solve.

1. Brackets 2. Exponents 3. Division or Multiplication (whichever is first) 4. Addition or Subtraction (whichever is first)

Exam
2 + (
2
n

Example 2
n - (2 x 3) = 4
n - 6 = 4
n = 10

Example 3
(4n) - 8 = 20
4 x 7 - 8 = 20
n = 7

Questions

...out ... variables using BEDMAS.

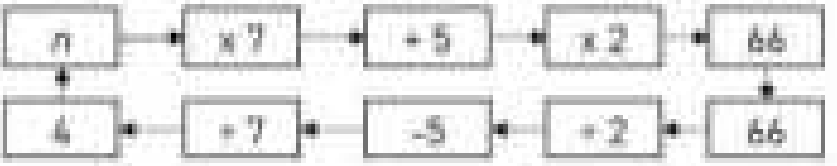
1) 9 + (4 x 5) = n	...	3) (9 x 6) + (12 ÷ n) = 58
4) n + (32 ÷ 8) = 12	5) 5(2 + p) = 45	6) ...
7) 48 ÷ t + (7 + 11) = 24	8) 32 − (3n + 16) = 1	9) 24 − (n x 5) = 4
10) $\frac{18 + n - 4}{4} = 5$	11) $\frac{9n + 3}{3} = 24$	12) 24 − 15 + (t x 3) = 27

Name: _____ 149

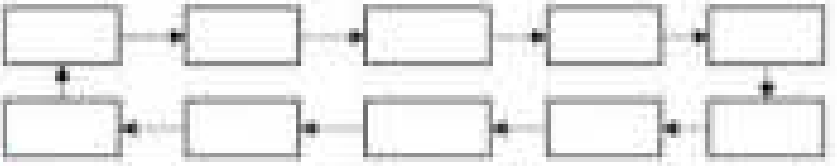
Division Equations – Flow Chart

Directions Fill in the blanks in the flow chart.

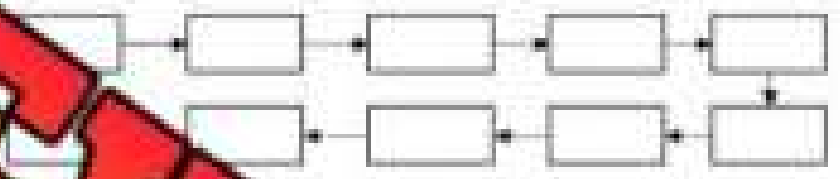
1) $2(5 + 7n) = 66$



2) $3(1$



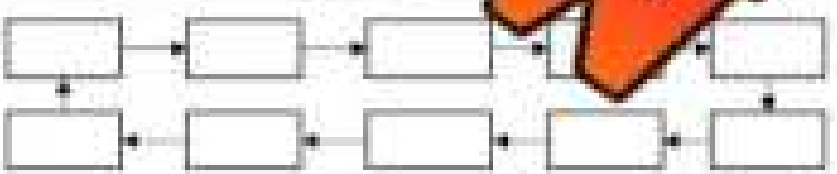
3) $-5(4t - 31) =$



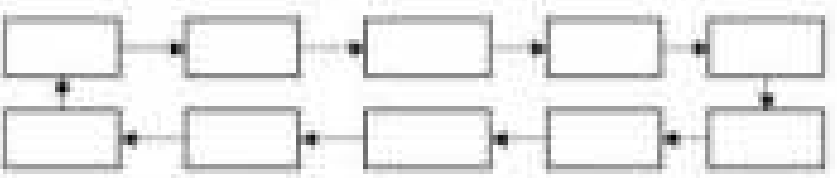
4) $-4(\frac{8r}{2} - 6) = -24$

5) $8(3 + 4n) = 88$

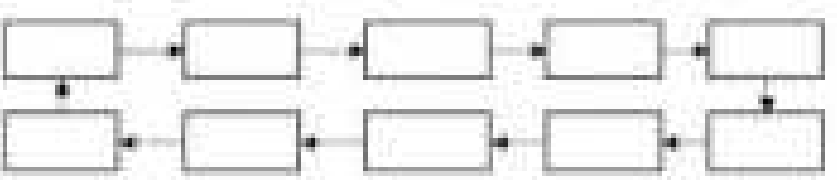
6) $-2(3 - 7y) = 36$



7) $\frac{6 + 6r}{2} = 15$



8) $-3(3n - 6) = 45$



Name: _____ 150

Mixed Operations - BEDMAS

Questions Find out the value of the variables using BEDMAS.

1) $-3(y + 6) = -30$	2) $3(11 - 4) + t = 35$	3) $8 + 4 \times 3 + (p) = 15$
4) $-5($	5) $11 - 4 + (n \times 8) = -41$	6) $8(7 + 4) - p = 61$
7) $\frac{49}{4+3} + t = 22$		9) $p + 28 \div 12 \div 3 = 40$
10) $-5n - (49 \div 7) = -47$	11) $\frac{7t+6}{9} + (-$	$12 \times 5 + p = 23$

Word Problem Write the equation for the situations below and answer the question.

1) Calvin went to the mall with $65. He bought 3 video games for n number of dollars. He then bought a drink for $4. He left the mall with $16? How much did each video game cost?

2) Freya ordered two slices of pizza and one soda for lunch. A slice of pizza is $3.50, and a soda is $2.00. Freya did the math below. What did she do wrong?

$3.50 + $2.00 x 2 = ?
$5.50 x 2 = $11.00

Name: _____ 152

Mixed Operations - BEDMAS

Word Problems Write the equation for the situations below and answer the question.

1) Omar is building his YouTube channel. He has some videos on his channel already and made 3 more last weekend. If he triples the number of videos he has, he will have 45 videos in total.

a) Write an equation that represents the problem.

b) How many videos did Omar start with?

2) A group of 9 friends went to the movies. Each movie ticket costs $11. All 9 friends decided to get a drink and popcorn combo. The total cost for the 9 friend's tickets and drinks and popcorn was $171.

a) Write an equation that represents the problem.

b) How much did each drink and popcorn combo cost?

3) A basketball team gets 2 points for a win, 1 point for a tie, and 0 points for a loss. The Vaughan Panthers ended the season with 42 points. They played 30 games.

a) Write an equation that represents the problem.

b) How many games did they win?

c) If they played 30 games in total, how many games did they lose?

Name: _____ 153

Introduction to Inequalities

Inequalities are used to tell the relative size of two expressions or numbers. We can use the greater than sign (>), or the smaller than sign (<). We can also use a new sign (≥) to show that a value is equal to or greater/less than the other value.

We often use a number line to graph the range of values that hold true for an inequality. An open dot on a number line is used when an inequality involves "less than" or "greater than", and a closed dot is used when it also includes "equal to".

Examples:

$x < 7$

$x \geq 12$

Questions

Graph the inequality on the number line and write the word form.

1) $x \geq 6$

Word Form – x is greater than or equal to 6

2) $x \leq 11$

Word Form – _____

3) $x < 9$

Word Form – _____

4) $x > 15$

Word Form – _____

5) $x \geq 7$

Word Form – _____

6) $x \leq 8$

Word Form – _____

Name: _____ 154

Inequalities – Multiple Choice

Questions Circle the values that satisfy each inequality.

1) $x > 48$

45 [illegible] 52 -45

2) $x < 31$

30 33 -8 -32

3) [illegible]

21 [illegible] 2

4) $x > 75$

74 -76 75 76

5) $x < -5$

-5 -6 -4 5

6) $x \leq 99$

[illegible] 97 -2

7) $x > -27$

-28 -26 -27 -30

8) [illegible]

-42 -40 [illegible]

9) $x \leq 79$

80 78 81 79

10) $x > -84$

-83 -85 -84 -86

11) $x < 87$

88 86 85 -87

12) $x < 145$

-144 145 -146 143

Name: _____ 155

Introduction to Inequalities

Part 1 Graph the inequality on the number line and write the word form.

1) $X > 9$

Word Form – _____

2) $X \leq 5$

Word Form – _____

3) $X < 2$

Word Form – _____

4) $X > 7$

Word Form – _____

5) $X \geq 14$

Word Form – _____

Part 2 Write the inequality shown by each number line.

1)

Answer _____

2)

Answer _____

3)

Answer _____

4)

Answer _____

Name: _____ 157

Inequalities in a Set - Addition

Questions | Which numbers in the set satisfy the inequality

1) Solve the inequality x ≤ 8 in the set (6, 10, 7, 8, 13, 15, 0)

Numbers that fit: 0, 6, 7, 8

2) Solve the inequality x + 12 ≤ 19 in the set (8, 4, 7, 9, 3, 6, 10)

Numbers that fit: _____

3) Solve the inequality x + 6 ≤ 15 in the set (-15, -25, -30, -10, -20, -22)

Numbers that fit: _____

4) Solve the inequality x + 47 ≤ 50, 39, 36, 40, 43, 32, -8)

Numbers that fit: _____

5) Solve the inequality x + 8 ≤ -21 in the set (-35, 35, 22)

Numbers that fit: _____

6) Solve the inequality x + 47 > 56 in the set (-9, 10, 11, 8, 9, 2)

Numbers that fit: _____

7) Solve the inequality -23 • x > -35 in the set (-10, -15, 12, 16, 22, -13)

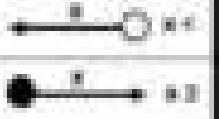
Numbers that fit: _____

8) Solve the inequality -32 • x < -41 in the set (-10, -12, 15, 9, -11, -8, -9)

Numbers that fit: _____

Name: _____ 158

Solving Inequalities - Subtraction



Questions Graph the subtraction inequalities using the number line.

1) $14 - x > 9$

2) $17 - x$

3) x

4) $x - 11 \leq -8$

5) $-12 - x \geq 4$

6) $8 - x > -6$

7) $x - 6 > -5$

8) $(-4) - x \geq 8$

9) $12 - x > -4$

10) $x - 3 \leq -9$

Name: _____ 160

Inequalities – Adding and Subtracting

Questions | Solve the inequalities below.

1) $x > 9 + 14 - 5$

$x > 18$

2) $x < 7 \times 4 - 11$

3) $x \leq 3$ [illegible]

4) $x \geq 25 - 4 \times 3$

5) $x < 6 + 5 - 5 \times$ [illegible]

$x \leq 14 + 3 - 23$

7) $x > 8 \times 5 + (-2)$

8) [illegible]

9) $x \leq 24 + 6 \times (-5)$

10) $x > 61 - 6 + (-15)$

11) $x < -5(4 + 6)$

12) $x < -8(32 + 8)$

Name: _____ 162

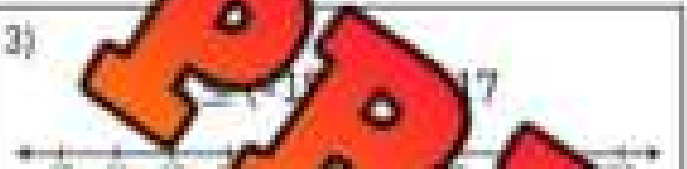
Graphing Inequalities – Multiple Operations

Questions Graph the inequalities on the number line.

1) $x > 8 + 5 - 7$

2) $x < 16 - 4 + (-7)$

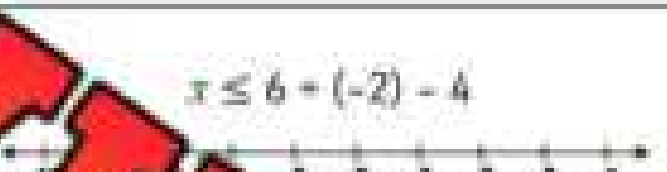
3)



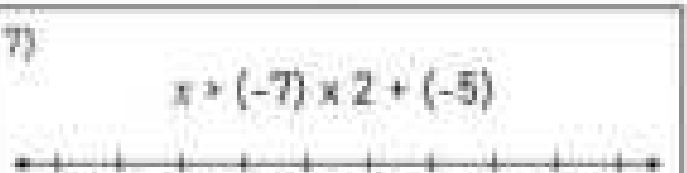
4) $x > 7 - 9 + 15$

5) $x \geq (-2) \times 5 + 3$

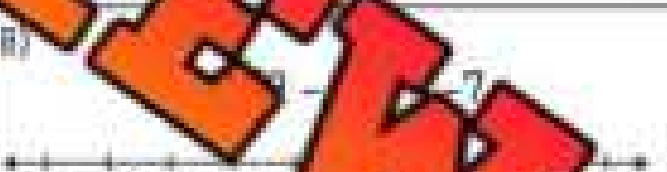
6) $x \leq 6 \div (-2) - 4$



7) $x > (-7) \times 2 + (-5)$



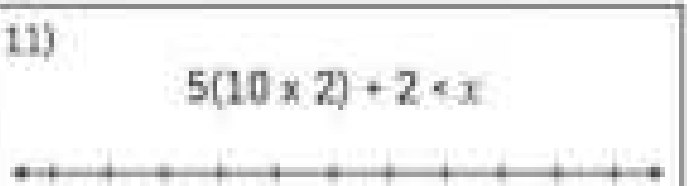
8)



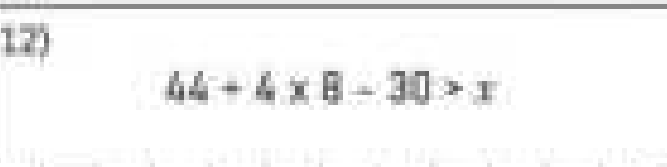
9) $x \leq (-20 \div -4)(-3)$

10) $x > -15 + 13 - 12$

11) $5(10 \times 2) + 2 < x$



12) $44 \div 4 \times 8 - 30 > x$



Name: _____ 163

Inequalities – Isolating the Variable

Steps to isolate a variable:

1. Add or subtract the same amount from both sides so that the variable is by itself
2. If the number that is with the variable is positive, you will subtract the same number from both sides.
3. If it is negative, you will add the number to both sides.
4. Since we want the variable on the left, we might need to flip it to the other side at the end. When we do this, we switch the inequality sign from < to > or from > to <.

Example:

$x - 14 \leq 9$

$x - 14 \leq 9 + 14$

$x \leq 23$

$15 > x + 9$

$15 - 9 > x + 9 - 9$

$6 > x$

$x < 6$

Questions

Solve the inequalities below.

1) $x - 5 < 15$

2) $x + 17 < 31$

3) $x + 12 \leq 25$

4) 3

5) $9 < x + 13$

6) $24 \leq x - 15$

7) $x + 32 > 25$

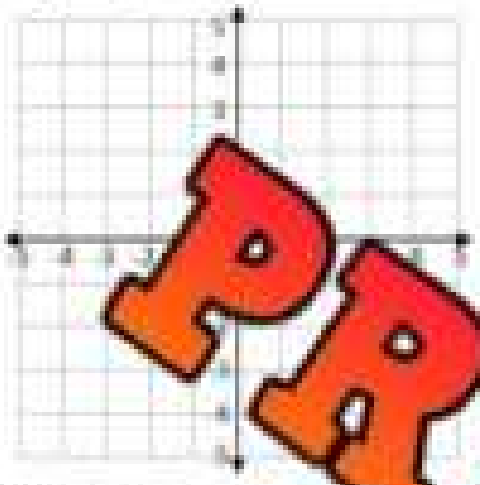
8) $48 < x + 56$

Name: _____ 165

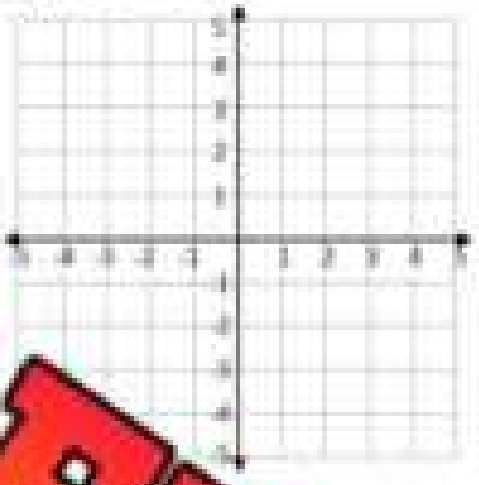
Graphing Inequalities – Cartesian Plane – One Variable

Questions | Graph the inequalities on the cartesian plane.

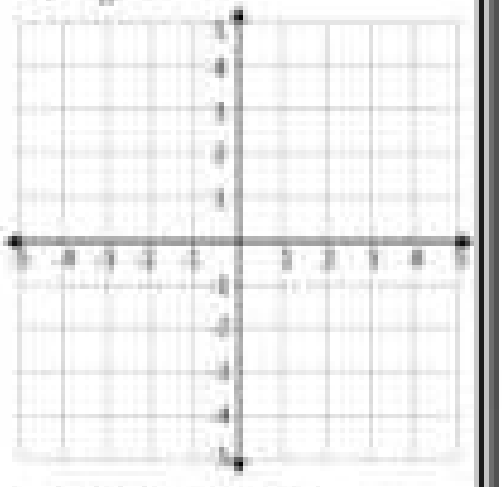
1) $x > 4$



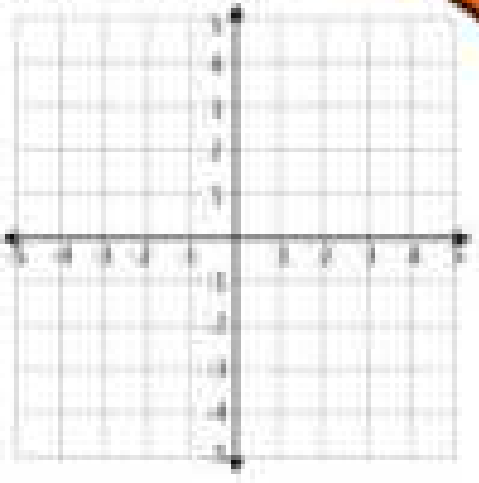
2) $x < -2$



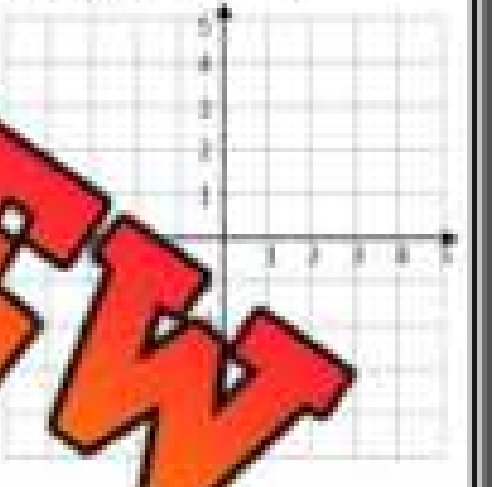
3) $y \leq 4$



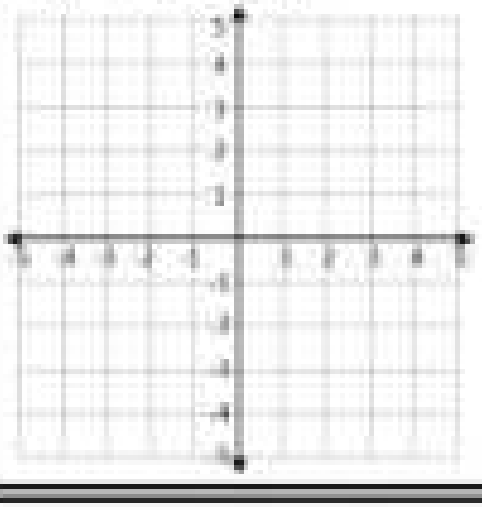
4) $3 + x > 6$



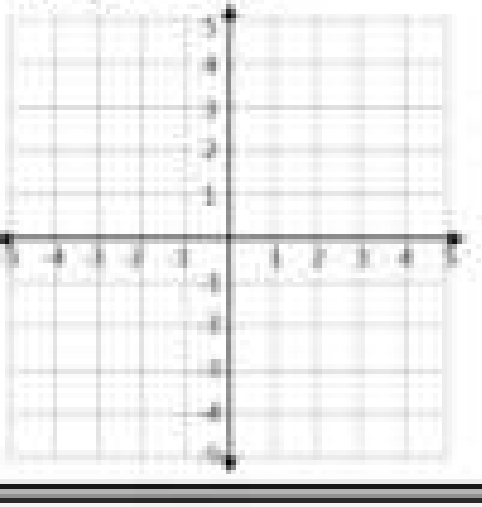
6) $y + 5 \leq 7$



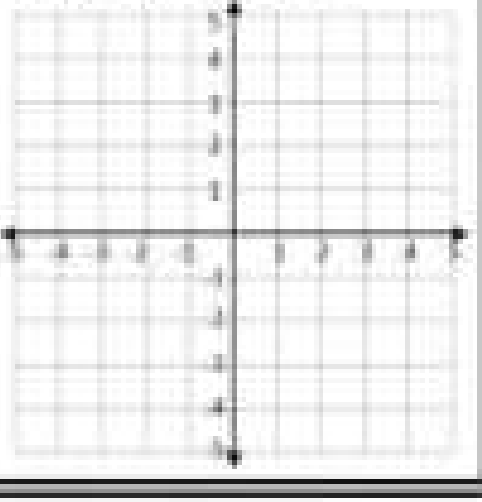
7) $9 + x \geq 11$



8) $y - 6 < -2$



9) $y + (-2) \leq -1$



Name: _____ 167

Linear Equations – Table of Values

A **linear equation** is an equation that is written for two different variables. The variables have a relationship where they increase or decrease at the same rate. This means when the variables are plotted on a graph, the line will be straight.

It is helpful to use a table of values to represent the values of both variables. This allows us to see the relationship between the variables. We can find any missing value by using an equation that represents the relationship between the variables. A related pair of x and y values is called an ordered pair.

Practice Complete the tables using the equations below.

x	y
1	
2	14
3	20
4	
5	
6	

1) $y = 6x + 2$

x	y
	-2
2	1
3	
5	
9	

2) $y = 3x - 5$

x	y
1	
2	
3	
4	
5	

x	y
1	
2	
3	
4	
5	
9	

4) $y = 4x - 7$

x	y
1	
2	
3	
4	
5	
10	

5) $y = -3x - 4$

x	y
1	
2	
3	
4	
5	
11	

6) $y = 5x - (-8)$

Name: _____ 168

Linear Equations – Table of Values

Practice Write the equation that represents the relation between x and y

x	y
1	2
2	9
3	16
4	
5	
6	

1) _____

x	y
1	-7
2	-11
3	-15
4	-19
5	
6	

2) _____

x	y
1	-3
2	0
3	3
4	6
5	
11	

3) _____

x	y
1	5
2	0
3	-5
4	-10
5	
9	

4) _____

x	y
1	-5
2	
3	
4	16
5	
10	

5) _____

x	y
1	-7
2	-18
3	-29
4	-40

6) _____

Practice Read the problem and represent it in the table of values.

An ice cream shop sells cones for $3 and toppings for $2 each. An equation for this relation is $y = 2x + 3$ where the 3 dollars is constant, and the x represents how many toppings are chosen.

a) Fill in the table of values

b) Fill in the ordered pairs below – Remember (x, y)

(1, ___) (2, ___) (3, ___) (8, ___) (12, ___) (20, ___)

x	y
1	
2	
3	
4	
5	

Name: _____ 170

Linear Equations – Table of Values

Practice Make a table of values for each relation.

1) $y = 3x + 2$

2) $y = 5x - 6$

3) $y = -2x + 3$

4) $y = 4x - 2$

5)

6) $y = -7x - 8$

Challenge Can you determine the equation using the

These ordered pairs are in the same linear relation: (-2, -4), (0, 4), (2, 12), (4, 20)

a) What is the equation that represents the values in the ordered pairs?

b) Fill in the missing value in the ordered pairs.
(1, ___), (3, ___), (8, ___), (-4, ___), (-8, ___), (___, 56), (___, -56)

c) Fill in the table of values for the linear relation.

x	-6	-3	0	5	7	12	15	20
y								

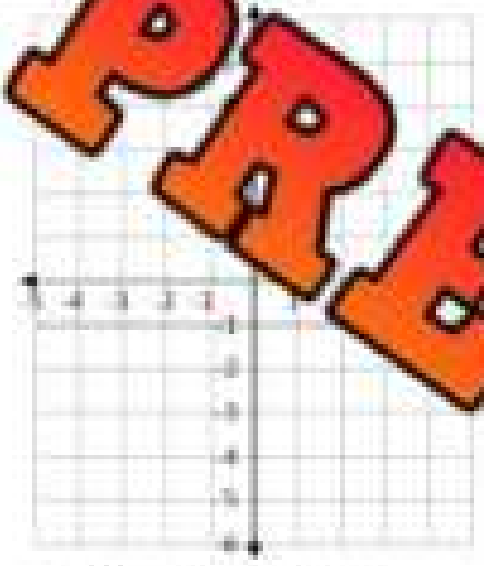
Name: _____ 171

Linear Equations – Graphing 2 Variables

Instructions Fill in the table of values and then graph the results using ordered pairs.

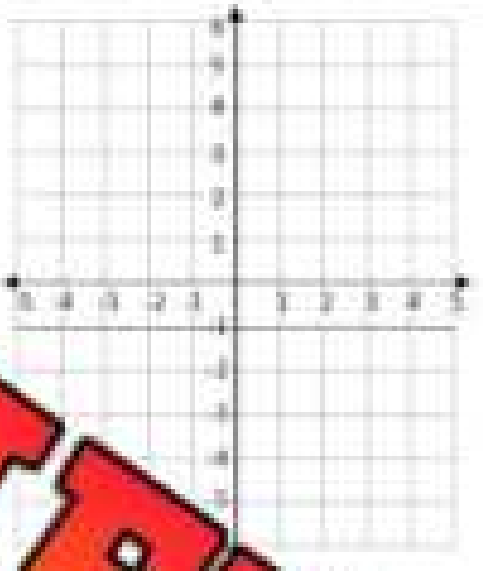
1) $y = 2x - 2$

x	0	1	2	3	4
y					



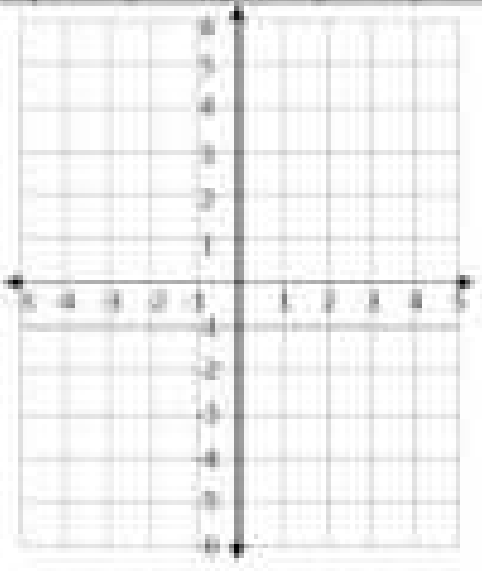
2) $y = 3x - 6$

x	0	1	2	3	4
y					



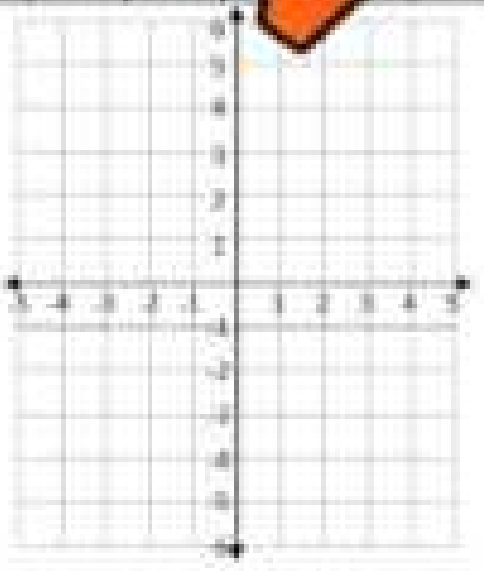
3) $y = -x + 2$

x	0	1	2	3	4
y					



3

x					
y					

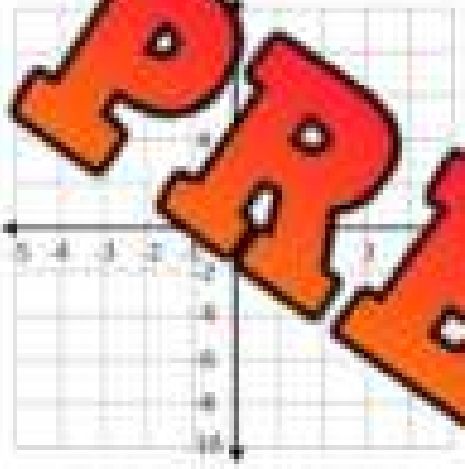


Name: _____ 173

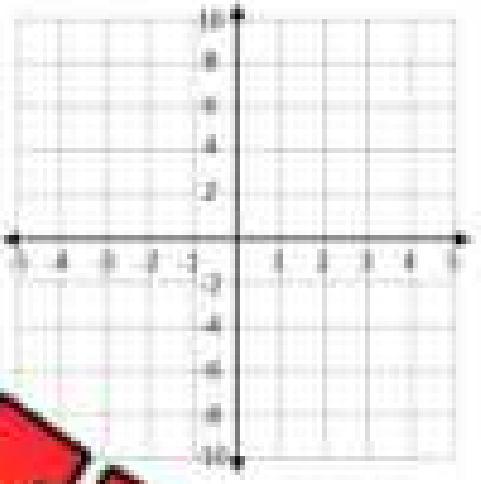
Linear Equations – Graphing 2 Variables

Instructions Graph the equations below. Create a table of values if necessary.

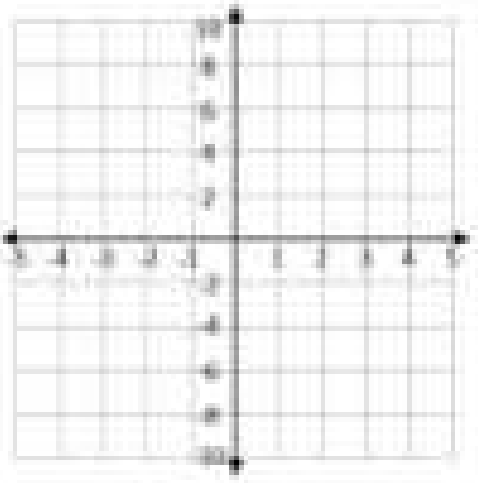
1) $y = 3x - 4$



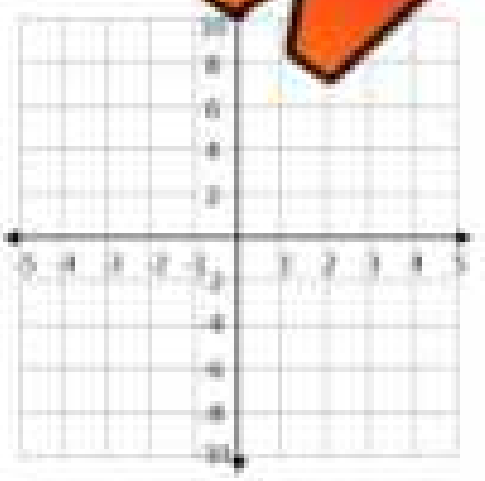
2) $y = -4x + 10$



3) $y = -3x + 8$



4) $y = 4$



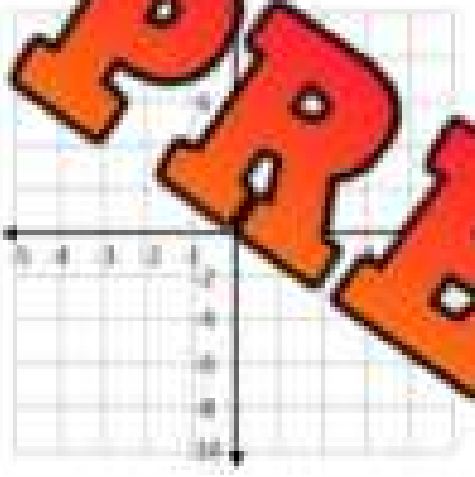
Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Graph the equations below.

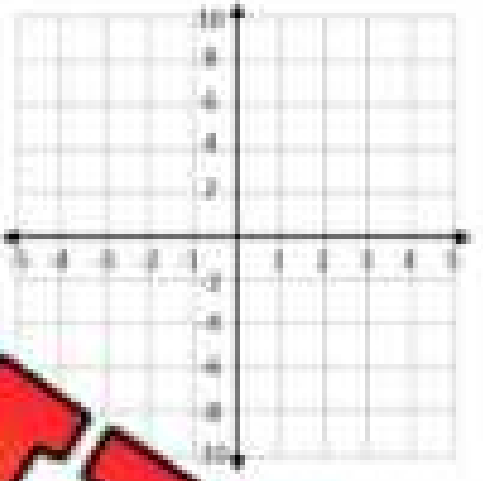
$y = -6x + 4$



Name: _____

Graph the equations below.

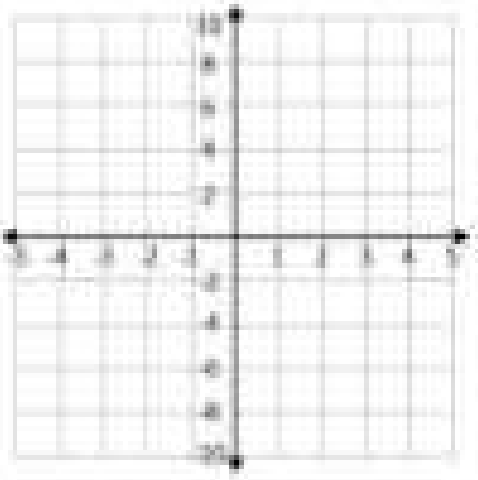
$y = -6x + 4$



Name: _____

Graph the equations below.

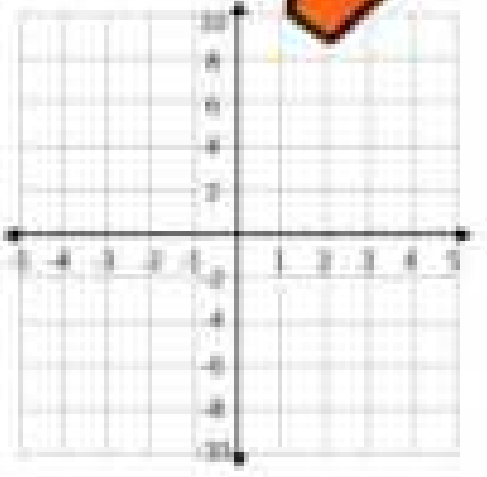
$y = -6x + 4$



Name: _____

Graph the equations below.

$y = -6x + 4$



Name: _____ 176

Linear Equations – Graphing 2 Variables

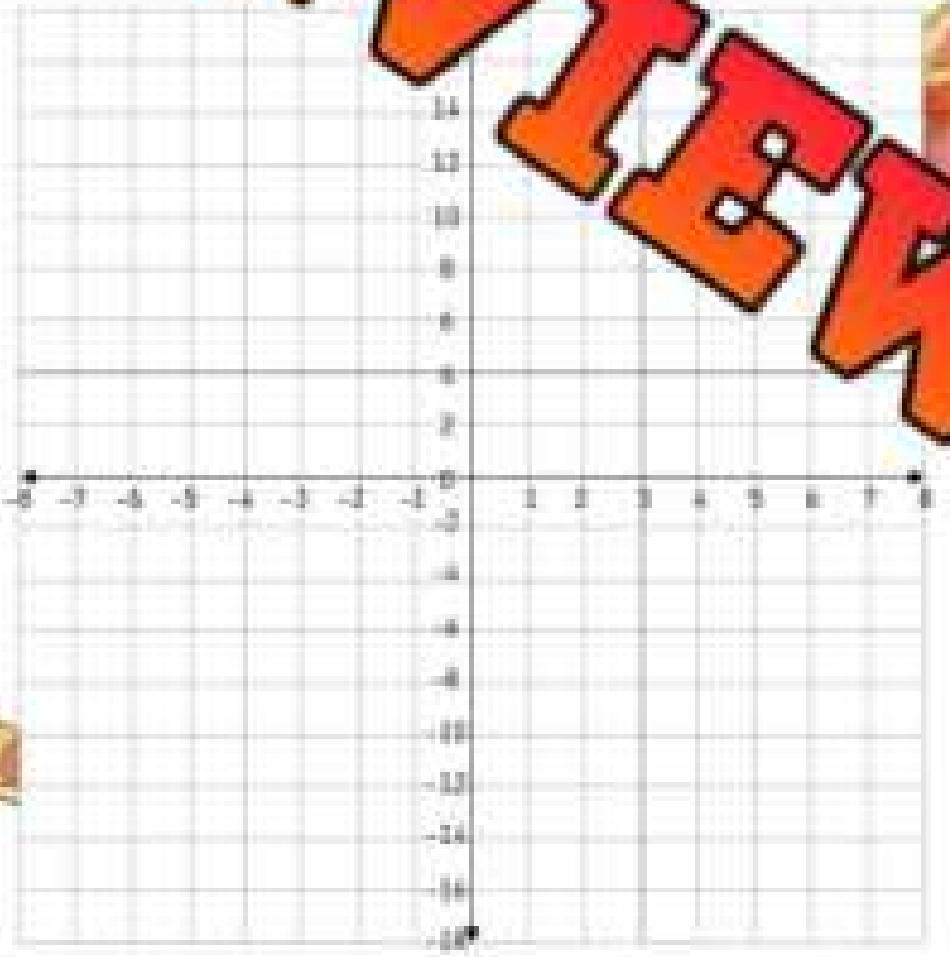
Instructions Fill in the table of values and then graph the results using ordered pairs.

Matt is hosting a pizza party. He will buy 2 slices for each person coming and 4 extra slices in case someone shows up unexpectedly. He determined an equation that will help him decide how many slices to buy: $y = 2x + 4$

a) Fill in the table of values using the equation above.

x		1	2	3	4	5	6
y							

b) Represent the values on the graph. Connect the dots using a line. Is the relation linear? Explain.



Name: _____ 177

Linear Equations – Graphing 2 Variables

Instructions Fill in the table of values and then graph the results using ordered pairs.

Hadley sells her homemade scarfs at a flee market. It costs her $10 to rent a table but she makes $5 each hour she is there. She uses the following equation to represent her earnings: $y = 5x - 10$

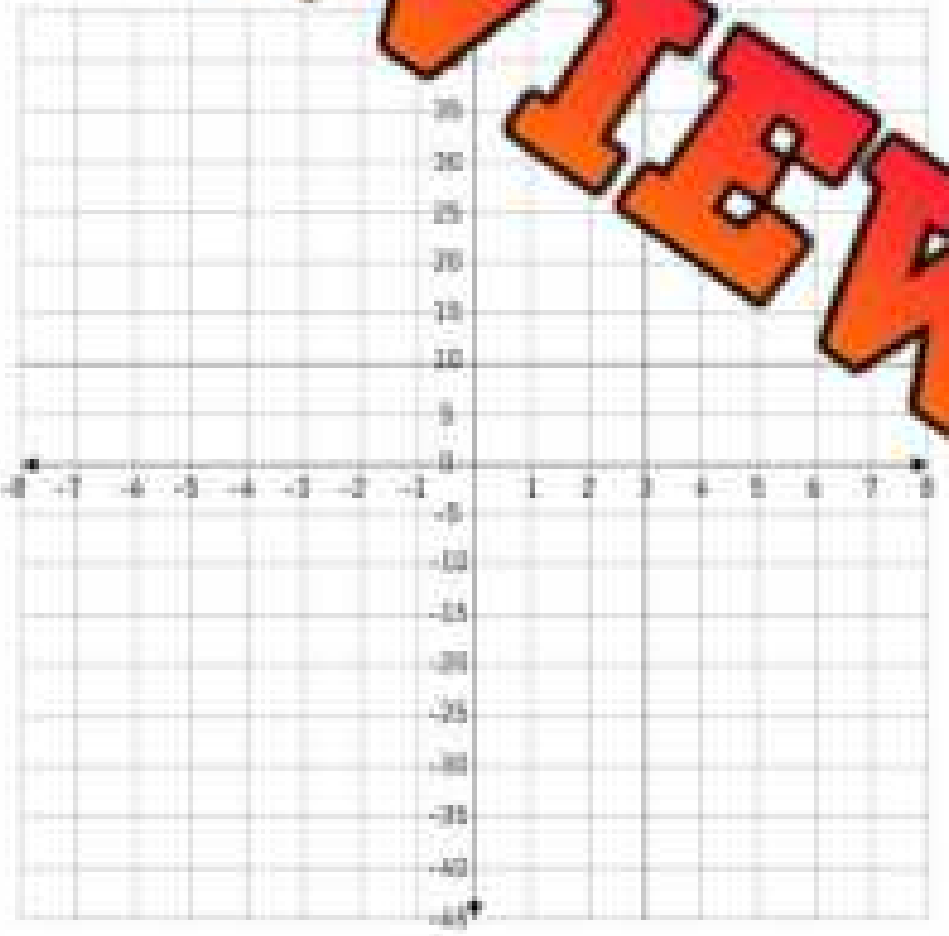
a) Fill in the table of values using the equation above.

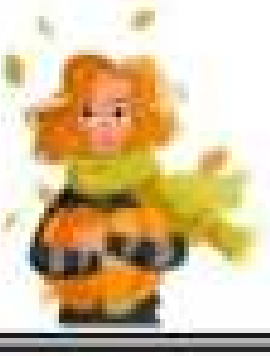
x		2	3	4	5	6	7	8

b) Represent the values on the graph. Connect the dots using a line.

c) Fill in the missing values for the ordered pairs below.

(10, ___), (20, ___), (___, 80), (___, 100), (___, 150)





Name: _____ 178

Linear Inequalities – Boundary Line

When we graph an inequality on a cartesian plane, we use a dashed line or a solid line depending if the inequality is greater/less than or greater/less than or equal to.

Greater/less than or equal $\leq$ $\geq$	Greater/less than $<$ $>$
———	- - - - - - - - - - - -

Part 1 Does the inequalities require a dashed or solid boundary line?

	Inequality	Dashed or Solid Boundary Line?
1)		
2)	≥ -3	
3)	$11 \geq$	
4)	$y - 7 \geq 13$	
5)	$y > 6 + 16$	

If the inequality uses a greater than or equal [illegible] the line. When we have a less than or equal sign, we shade [illegible]

Part 2 Fill in the table below.

	Inequality	Dashed or Solid Boundary Line?	Shade Above or Below
1)	$x \geq 9$		
2)	$y < 5$		
3)	$12 - (-4) \geq x$		
4)	$9 + x \leq 25$		
5)	$15 - y < 25 + 3$		
6)	$x + 12 - 6 > 29$		
7)	$8 + 6 - y < 31 + 5$		
8)	$y - 5 \geq 11 \times 6 - 8$		

Name: _____ 179

Linear Inequalities – Boundary Line

Questions Fill in the table below

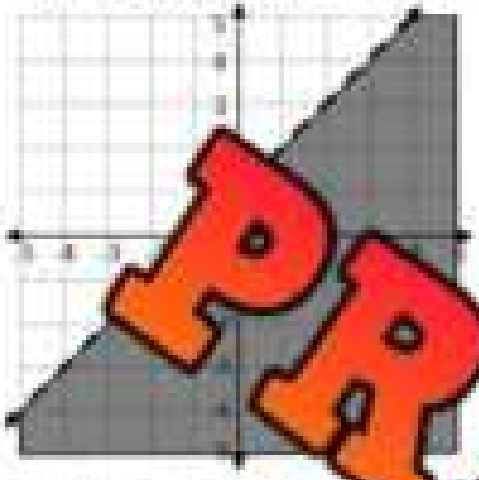
	Inequality	Simplify (if necessary)	Dashed or Solid Line	Shade Above or Below
1)	≤ 15			
2)				
3)	$13 \geq$			
4)	$11 + x \geq 15 \times 2$			
5)	$9 + (-5) > y + 9$			
6)	$8 < 32x$			
7)	$5 + y \geq \frac{48}{-6}$			
8)	$7 > \frac{56}{7} + y$			
9)	$y \geq 25 + \frac{-48}{12}$			
10)	$13 - 5 < -2x$			

Name: _____ 180

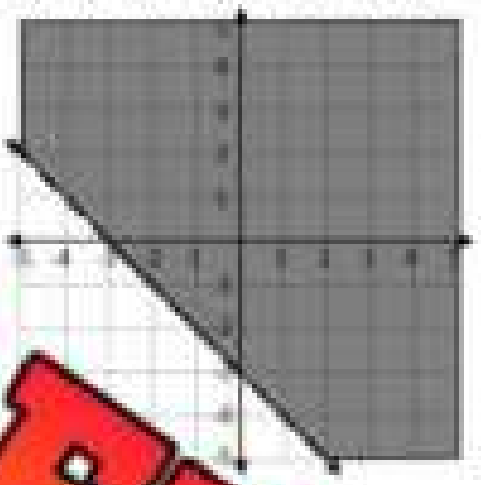
Linear Inequalities – Order Paris

Questions Circle whether the ordered pair is a solution of the graph.

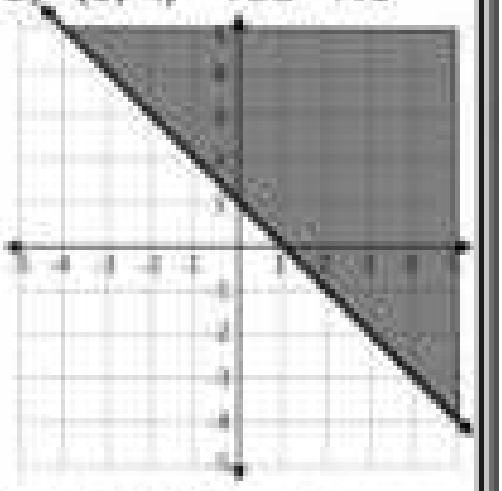
1) (-3, 2) Yes No



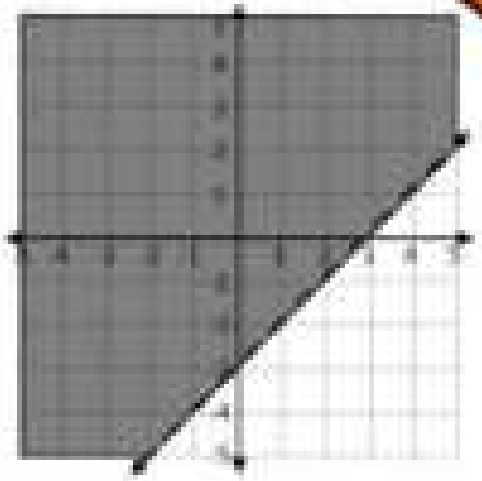
2) (-4, -2) Yes No



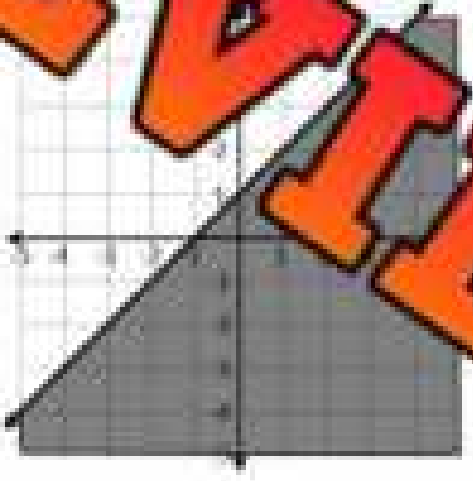
3) (3, 4) Yes No



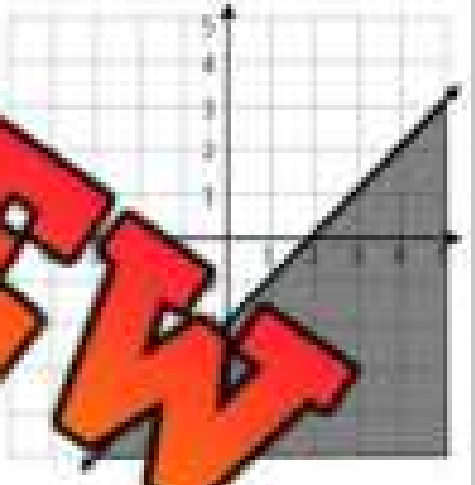
4) (-5, -5) Yes No



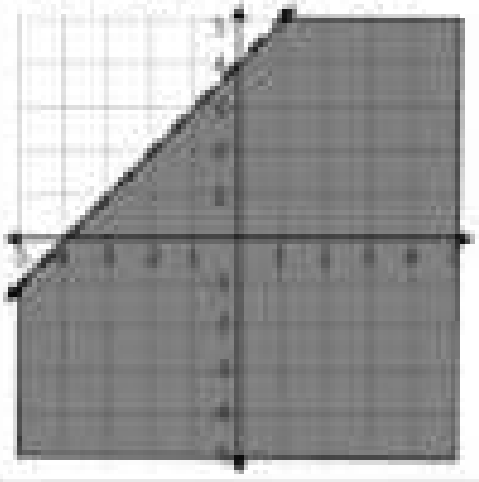
5) (2, 4) Yes No



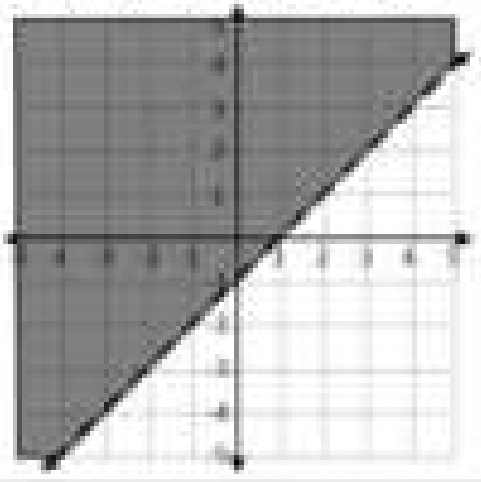
6) (-3, 0) Yes No



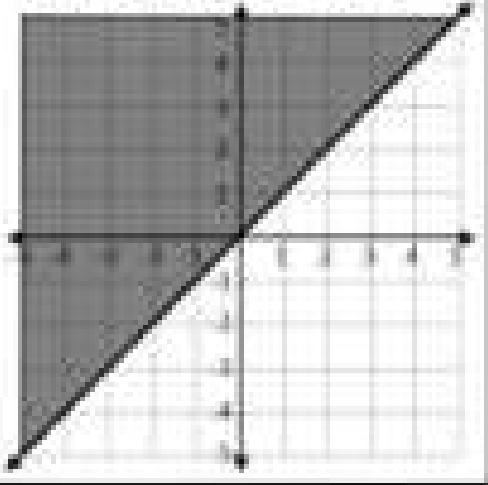
7) (0, 4) Yes No



8) (-2, -4) Yes No



9) (0, 0) Yes No



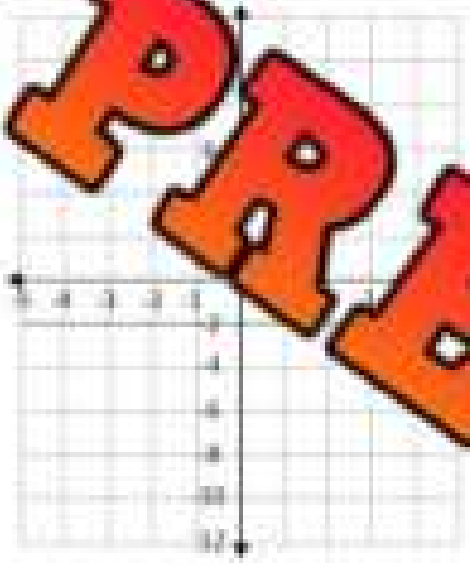
Name: _____ 181

Graphing Inequalities – Two Variables

Questions Fill in the table of values and then graph inequalities.

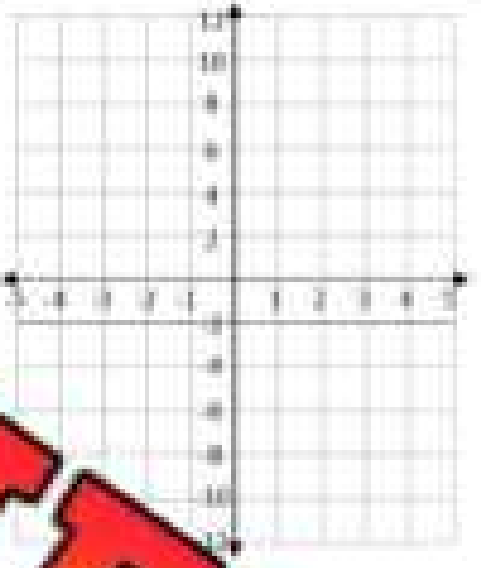
1) $y > -2x - 2$

x	0	1	2	3	4
y					



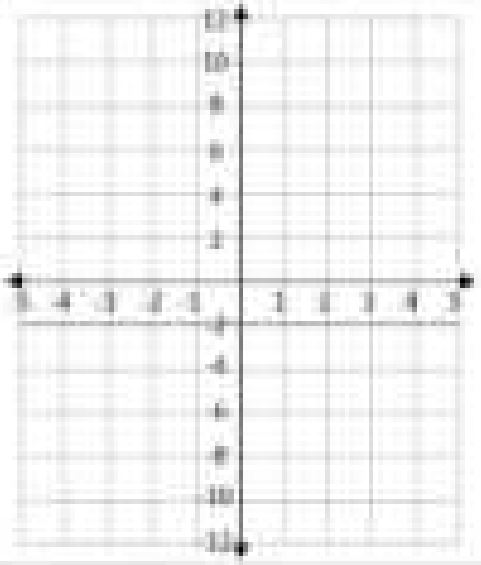
2) $y < -x + 4$

x	0	1	2	3	4
y					



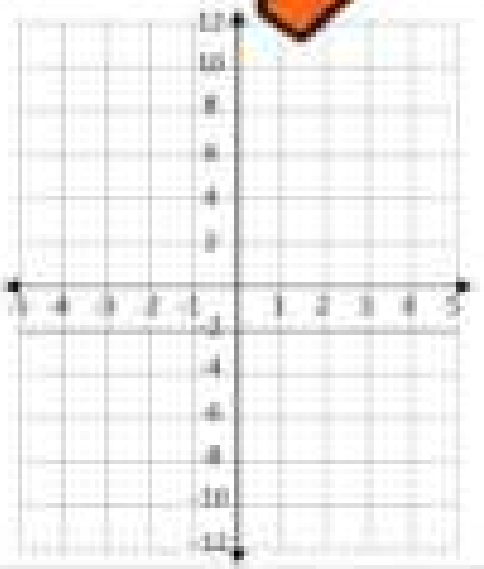
3) $y \geq -3x + 4$

x	0	1	2	3	4
y					



4)

x					
y					



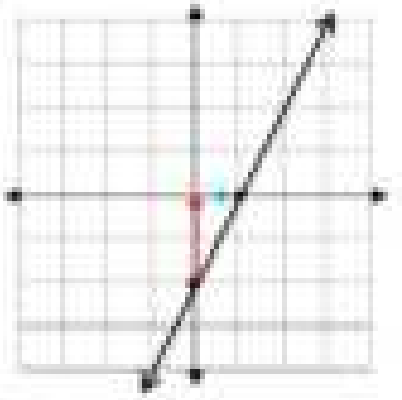
Name: _____ 182

Rise Over Run - Slope

The **slope** of a line is how steep the line is. We can determine the slope of a line by remembering 'rise over run'.

$$\frac{\text{Rise}}{\text{Run}}$$

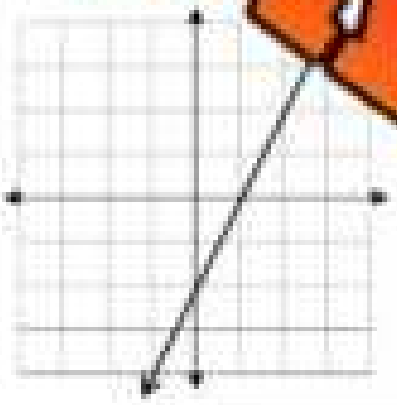
In the example to the right, we can see the rise is 2, and the run is 1. This means our slope is $\frac{2}{1}$ or 2.



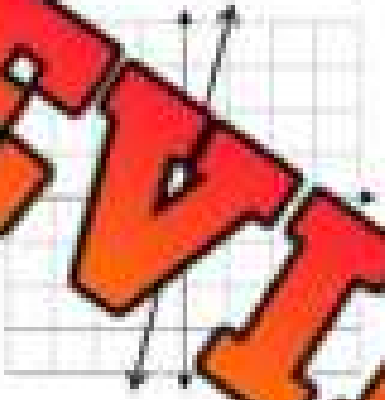
If a line increases from left to right, it is positive.
If it decreases from left to right, it is negative.

Question: What is the slope of each line? Use arrows to label the rise and run.

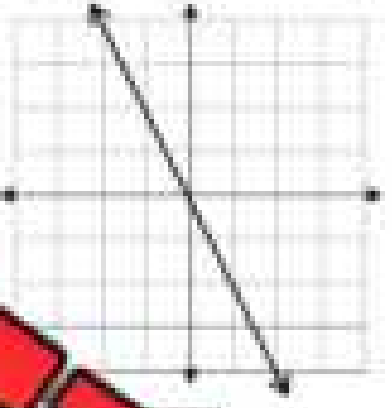
1 _____



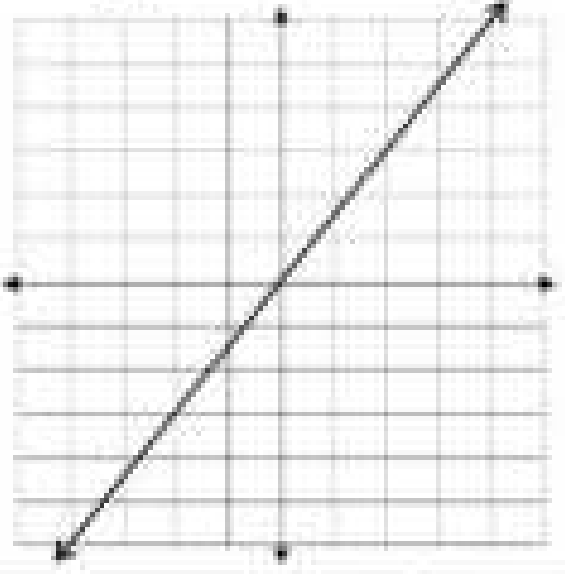
2 _____

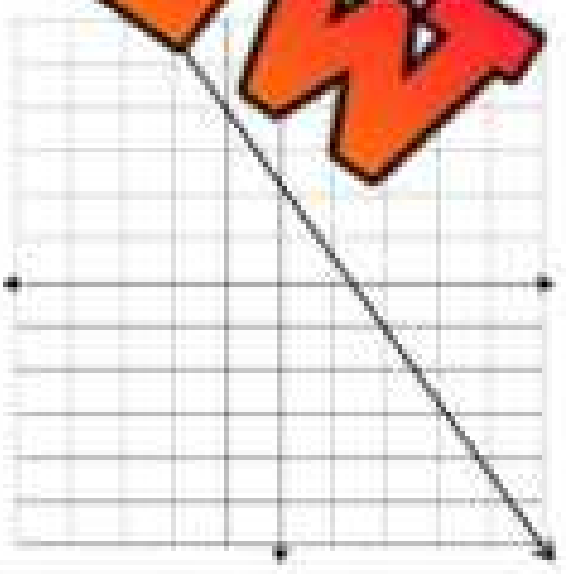


3 _____



4 _____





6) Write 4 ordered pairs from question 5.

Name: _____ 183

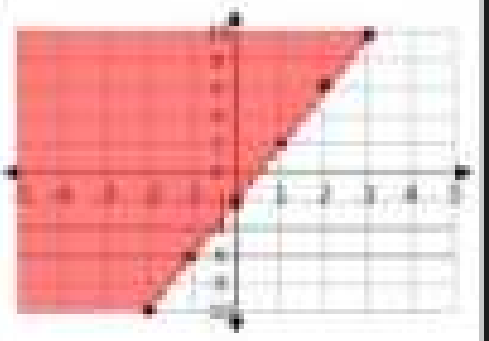
Graphing Inequalities – Two Variables

Example – $y > 2x - 2$

The slope is 2 and the constant is -2.

Steps:

1) The y-intercept is -2. Plot a dot on the y-axis at -2
2) The slope is 2. Go up 2 and right 1
3) Plot the next coordinates going up 2 and right 1
4) Once you have 3 coordinates plotted, you can draw your line using dashes if > or < and solid if ≥ or ≤.



Question: Graph the inequalities on the cartesian planes below.

1) $y \geq -3$

2) $y < 2x + 4$

3) $y \geq 3x - 2$

4) $y > -2x - 2$

5) $y > -x + 5$

6) $y \leq x - 6$

Name: _____ 185

Algebra Quiz - Equations

Part 1 — Solve

1) 8n + 4n = _____n	2) 11p + 7p = _____p	3) (-25c) + 33c = _____c
4) 15n + 32n + 11p + 38p = _____n _____p	5) 12p − 4p = _____p	6) 15s + r − 14s − 13r = _____s = _____r
7) [illegible] = _____s _____r	8) 32n − 43c − 33n + 21c = _____n = _____c	9) 42n + y − 13y − 23c + 46c = _____n = _____c = _____y

Part 2 — Write the letter [illegible] equivalent expression from column 1.

Answer	Column 1	Letter	Column 2
	5(7 − t)		5t + 35
	-5(7 + t)		-5t
	5(t + 7)	c	[illegible]
	-5(t − 7)	d	

Part 3 — Add and subtract the binomials below.

1) (8y + 9) + (5y + 6)	2) (11m − 14y) − (y − 4m)
3) (33y − 16u) − (14u + 18y)	4) (22y − 15u) + (7u − 15y)

Part 4 Evaluate the following expressions for x = 5 and p = −7

1) $(x) + (p) - 11$	2) $17 + x + (p)$	3) $(19 - x) - (p)$	4) $x + (26 + p)$
5) $54 \div (p + 5x)$	6) $22 + 8x - (p + 5)$	7) $12 - \frac{7x}{p} + 5p$	8) $9x + (2p - x)$

Part 5 Find out the equal sign (=) if it is not balanced.

1) $(-9) + 7 = 2$	2) $13 \quad -5$	3) $(-21) + 13 = -8$
4) $\frac{50}{10} = -10$	5) $\frac{\quad}{-9} = (-4$	6) $\frac{48}{-8} = 6$

Part 6 Find out the value of the variable

1) $12 + n = 23$ $n =$	2) $n + 15 = 29$ $n =$	3) $n =$
4) $12.5 - 3.1 = p$ $p =$	5) $9.2 - p = 6.4$ $p =$	6) $-3.5 + r = -7.8$ $r =$
7) $(-3n) = (-18)$ $n =$	8) $6n = (-42)$ $n =$	9) $\frac{n}{8} = -9$ $n =$

Part 7 Find out the value of the variables using BEDMAS.

1) $9 + (4 \times 5) = n$	2) $31 - (7 \times p) = 10$	3) $(9 \times 6) + (12 \div n) = 58$
4) $n + (32 \div 8) = 12$	5) $5(2 + p) = 45$	6) $9n - 2 = 27$

Part 8 W[illegible] situations below and answer the questions.

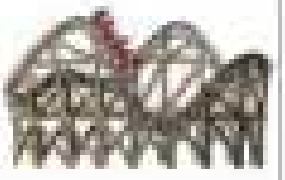
1) Parker takes some candy from his home before leaving to go trick-or-treating on Halloween. He collects more candies at the houses in his neighbourhood. If he triples the number of candies he has at the end of the night, he will have 90 candies. How many candies did he take from his house?

a) Write an equation that represents the problem.

b) How many candies did he take from his house?

2) A group of 8 friends went to an amusement park. Tickets to enter the park cost $9. Each friend purchased the all-inclusive pass that allowed them to go on as many rides as they wanted to. In total, the 8 friends paid $176 for the ticket and all-inclusive pass.

a) Write an equation that represents the problem.



b) How much did the all-inclusive pass cost?

Part 9 Graph the inequalities on the number line.

1) $4 + x > 12$

2) $17 - x \leq 9$

Part 10 [illegible]ify the inequalities below. Make sure the variable is on the left.

1) [illegible] 5

2) $x \leq 24 + 6 \times (-5)$

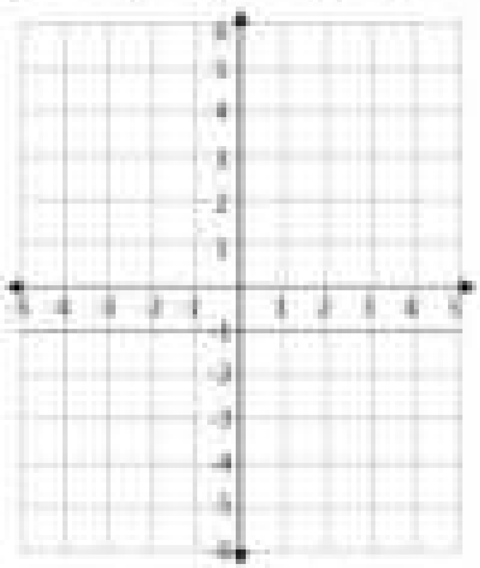
3) $48 < x$ [illegible]

4) $x + (3 \times 4) \leq 60 + (-10)$

Part 11 Fill in the table of values and then [illegible] the [illegible]

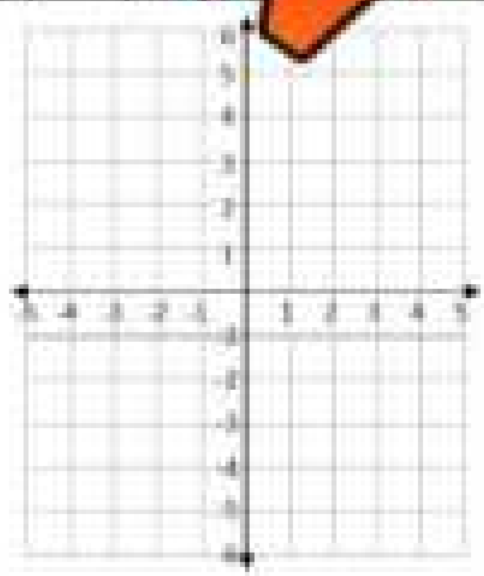
1) $y > -x + 2$

x	0	1	2	3	4
y					



[illegible] y [illegible] 6

x	[illegible]	1	[illegible]	[illegible]	[illegible]
y					



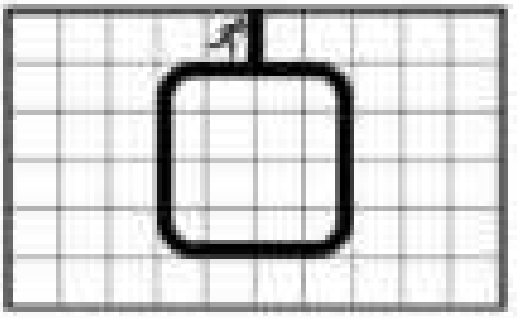
Grade 7
C3. Coding

	Curriculum Expectations	Pages That Cover the Expectations
C3.1	solve problems and create computational representations of mathematical situations by writing and executing code, including code that involves the analysis of data in order to inform and communicate decisions	190 – 193, 195 – 201, 203 – 205, 207 – 214
C3.2	read and alter existing code involving the analysis of data in order to inform and communicate decisions, and describe how changes to the code affect the outcomes and the efficiency of the code	191, 194, 202 – 206

Name: _____ 190

Writing Code - Loops

Writing Code – Code Bank
go right (# of spaces)
go left (# of spaces)
go down (# of spaces)
go up (# of spaces)
loop ___ times

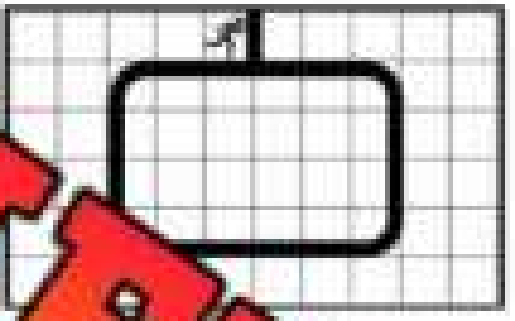


Example
loop 5 times
  go right 3
  go down 5
  go left 5
  go up 5
  go right 2
go right 1

Question code that sends the runner around the track.

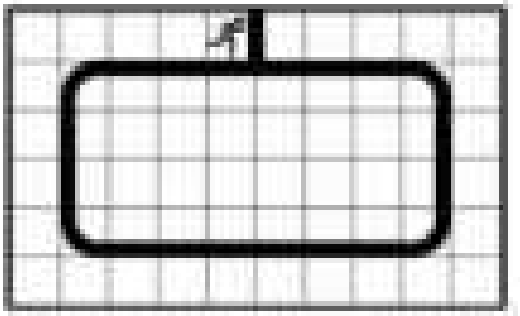
1. Use a loop to send the runner around the track 7 times. (Don't forget to cross the finish line!)

Line 1: _____
Line 2: _____
Line 3: _____
Line 4: _____
Line 5: _____
Line 6: _____
Line 7: _____



2. Use a loop to send the runner around the track 5 times. (Don't forget to cross the finish line!)

Line 1: _____
Line 2: _____
Line 3: _____
Line 4: _____
Line 5: _____
Line 6: _____
Line 7: _____



Name: _____ 194

Introduction to If/Then Statements

An if/then statement is a conditional that is an action that could occur if something specific happens.
For example – If the bell goes at school, then the students go to class.

Questions Fill in the If/Then Statements with outcomes that make sense.

1)	If [illegible] into the	then _____
2)	If they	_____
3)	If player 1 pushes	_____
4)	If a key is pushed on a piano,	then _____
5)	If you answer correctly,	then _____
6)	If the song ends,	then _____
7)	If user presses the shuffle song button,	then _____
8)	If player 1 has more points than player 2 at the end of the game,	then _____
9)	If the password entered is incorrect,	then _____
10)	If the play button is pushed,	then _____

Name: _____ 195

If Statements – Conditional Coding

An if statement allows a code to be run if an event has happened. If the event does not happen, the code is not run. All interactive games use if statements. For example, when a game has a button in it, the button will have an if code. This means that if the button is pushed, then a code will run that causes something to happen.

Example Code - If player gets 50 points, then print "Great Job!"

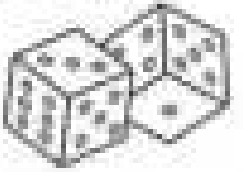
Question: Calculate the answer to the question and then run the code.

	Written	The Computer Prints...
If answer is ≥ [illegible] print [illegible] If answer is <90, th[illegible] run 5 x 12 + 32		
If y is <150, then print "Better luck [illegible] time!" If y is ≥150, then print "Wow, great job!" run $y = 6 \times 15 + 55$		
If player has ≥500 points (p), then print "You win" If player has <500 points (p), then print "You lose" run $p = 100 + 2^2 \times 10 \times 2 - 10$		
If student mark (m) is ≥80%, then print "Genius!" If student mark (m) is <80%, then print "Good effort!" run $m = 21/25$		
If student mark (m) is ≥50%, then print "You passed" If student mark (m) is <50%, then print "You failed" run $m = \frac{8+9+8}{50}$		

Name: _____ 198

If Statements – Dice Game

The object of the game is to get as many points as you can. Follow the if/then statements to get points.



Instructions:

1. Start at question 1. Read the if/then statement to get points
2. Go through all 10 questions and add up your points at the end

Questions ...e a dice to play the game below. Follow the if/then codes.

...en Code	Point Total
1) If you ... you get +10 points If you roll ... get -10 points	
2) If you roll a 6, th... If you don't roll a 6, ... 0	
3) If you roll a 3 or 4, then you ... If you don't roll a 3 or 4, then you ... points	
4) If you roll a 2, then you start over at 0 po... If you roll any other number, then you get ...	
5) If you roll 3 or less, then you get +10 points If you roll 4 or more, then you get -10 points	
6) If you roll a 1 or 6, then you get +15 points If you don't roll a 1 or 6, then you get -5 points	
7) If you roll 2 or more, then you get +5 points If you roll a 1, then you get -20 points	
8) If you roll an odd number, then you get +10 points If you roll an even number, then you get -10 points	
9) If you roll a 3, then you get +20 points If you don't roll a 3, then you get 0 points	
10) If you roll a 5 or less, then you get +10 points If you roll a 6, then you get -25 points	

Name: _____ 197

If Statements – Dice Game

The object of the game is to get as many points as you can. Follow the if/then statements and solve any equation from the list you are sent to. Cross out the equation once you have used it because you can only use each equation once. You earn the answer from the equation as points. Record your points in the column on the right.

Instructions Follow the if/then codes to solve equations and earn points.

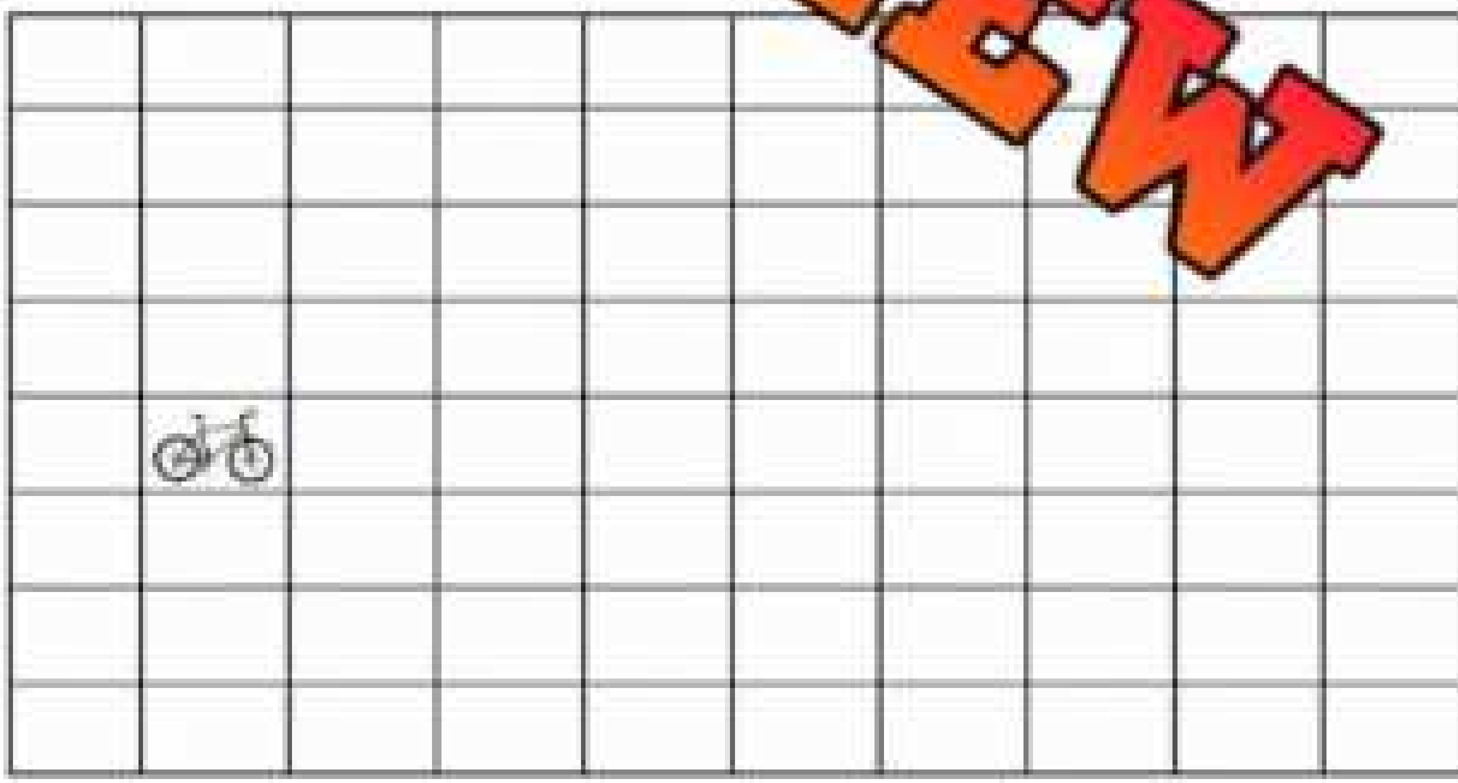
If/Then Code	Points
1) If you [illegible]mber, then solve an equation from list 1 If [illegible] then solve an equation from list 2	
2) If you [illegible] a 3 [illegible] solve an equation from list 3 If you roll a [illegible] equation from list 4	
3) If you roll a 6, [illegible] list 3 If you roll a numbe[illegible] equation from list 2	
4) If you roll an even numb[illegible] from list 5 If you roll an odd number, th[illegible] list 6	
5) If you roll a 1 or a 6, then solve an e[illegible] from [illegible] If you roll a 2, 3, 4, or 5, then solve an [illegible]	
6) If you roll a 2 or 5, then solve an equation fr[illegible]st If you roll a 1, 3, 4, or 6, then solve an equation [illegible]	
7) If you roll a 3 or 4, then solve an equation from list 5 If you roll a 1, 2, 5, or 6, then solve an equation from list [illegible]	
8) If you roll a 6, then solve an equation from any list If you roll a 1, 2, 3, 4, or 5, then solve an equation from list 1	
9) If you roll a 1 then solve an equation from any list If you roll a 2, 3, 4, 5, or 6, then solve an equation from list 1	
Total Points	

List 1	List 2	List 3	List 4	List 5	List 6
5 + 5	15 - 5	3 x 2	25 ÷ 5	12 + 12	3 x 3
12 + 6	14 - 6	7 x 5	30 ÷ 10	23 + 5	4 x 6
13 + 8	40 - 32	3 x 6	20 ÷ 4	15 + 13	7 x 3
21 + 13	32 - 21	4 x 5	12 ÷ 2	41 - 13	40 ÷ 4
14 + 22	45 - 15	9 x 4	15 ÷ 3	50 - 10	48 ÷ 8
30 + 20	50 - 21	6 x 6	36 ÷ 6	40 - 15	9 ÷ 3

If Then Conditional Statements – Activity

Instructions Follow the if/then statements and move the bike around the grid.

	If/Then Conditional Statements		If/Then Conditional Statements
1)	If y = >−40, then move bike right 5 y = 2[illegible] + 14	6)	If y = >400, then move bike left 5 y = 30 x 5 x 2.5
2)	If t [illegible] move bike down 3	7)	If t = >100, then move bike left 4 $10^2 + 10^1 = t$
3)	If p = <20[illegible] 4 p = 50 x -2 [illegible]	8)	If p = >−500, then move bike down 5 p = 4 x -200 + 250
4)	If y = <0, then mo[illegible] 3 3y − 18 = −3	9)	If y = <5, then move bike down 5 [illegible] − 25 = −43
5)	If b = >10, then move bike up 7 (-5 + 80) ÷ b = 5	10)	[illegible], then move bike right 6 -10[illegible]) x 2



Name: _____ 203

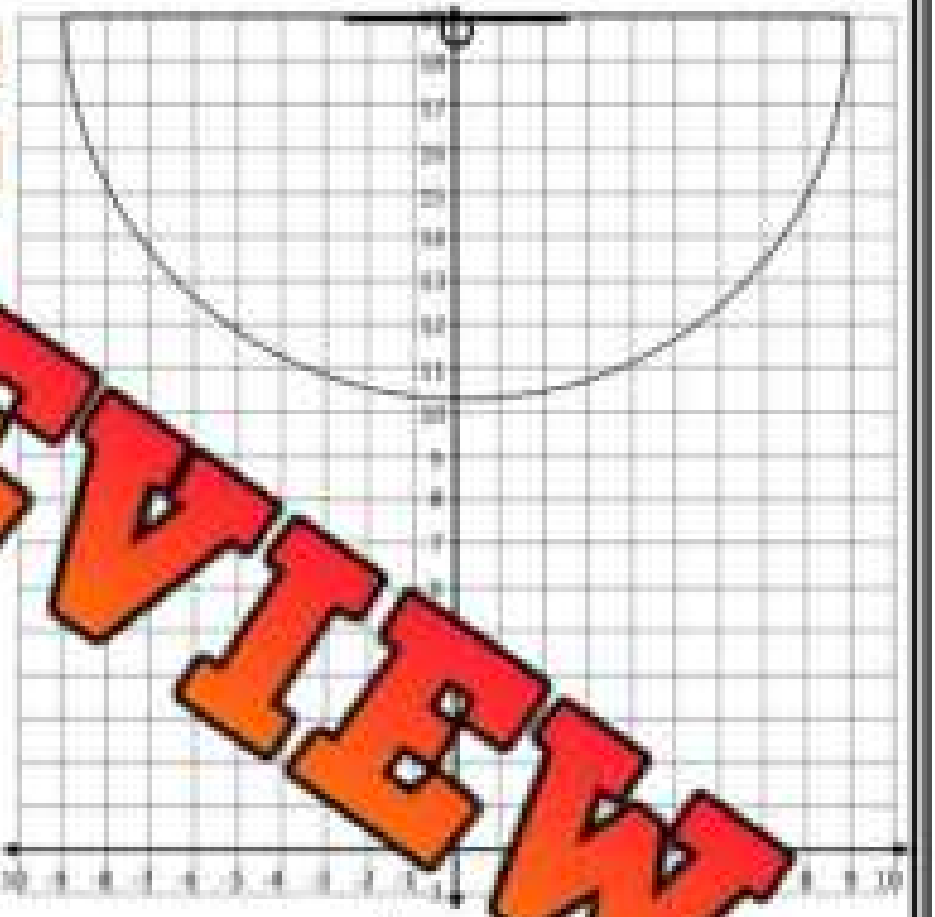
Using Programs to Analyze Data - Basketball

Directions Use the data to program Curry's shooting from last game.

Steph Curry is a tremendous shooter. His shot attempts and shot makes from his last game have been displayed in the table below. The coordinates for each shot show where Curry made or missed from.

Program

Shot Made	Shot Missed
(3, 9)	
(-5, 10)	
(1, 8)	
(-10, 18)	(-8, 17)
(-1,18)	(6, 10)
(4,1)	(-8, 12)
(2, 15)	(9, 15)
(-6, 11)	(6, 14)
(-2, 15)	
(1, 18)	



Questions Answer the questions below.

Questions	Answers
1) What was Curry's field goal percentage? (#Makes/#Total Shots)	
2) What was Curry's 3-point percentage? (#3-Point Makes/#Total 3-Point Shots)	
3) How many points did Curry have?	
4) Curry has asked you where he should shoot from. Use the data from the program to give him at least 2 tips.	

Name: _____ 20__

Using Programs to Analyze Data - Baseball

Directions Use the data to program Gausman's shooting from last game.

Kevin Gausman pitches for the Blue Jays. He only pitched 3 innings last game. His strikes and pitches that resulted in a hit are recorded in the table. Where he threw each pitch has been displayed using coordinates.

Program

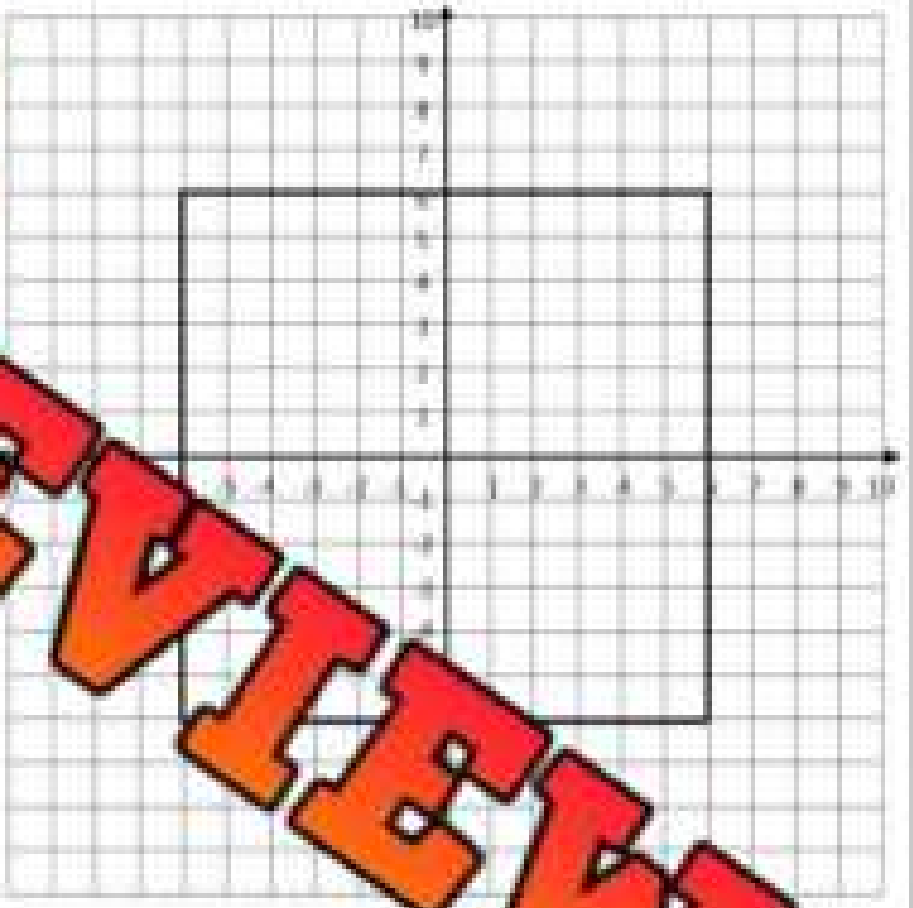
if the pitch is a strike

then plot a gre... using the coordinates

if the pitch i... play

then plot ... dinates

S...	
(-3, 8)	
(-6, -6)	2)
(5, -5)	
(3, 6)	(-2, 2)
(-7, 4)	(2, -1)
(6, 6)	(-3, -2)
(-5, -4)	(3, -2)
(-8, -4)	(-2, -3)
(5, 5)	(2, -2)
(-3, 5)	



Questions Answer the questions below.

Questions	Answers
1) How many strikes did Gausman throw?	
2) How many hits did he give up?	
3) How many pitches did he make in the upper part of the strike zone?	
4) How many strikes did Gausman throw out of the strike zone?	
5) Gausman has asked you where he should throw his pitches. Use the data from the program to give him at least 2 tips.	

Name: ______________________ 205

Analyze Data – Rock, Paper, Scissors

Directions Follow the program code to analyze patterns in Rock, Paper, Scissors.

When we play rock, paper, scissors, we unintentionally follow patterns that can be used against us. Creating a program that collects data can help us find patterns that could be useful in determining which option our opponent will use next.

Directions

1) Play 2[illegible] of rock paper scissors wi[illegible]
2) C[illegible] round, foll[illegible] pro[illegible]
3) Use the da[illegible] de[illegible] ich option to p[illegible]

loop (20) times
if opponent shows (rock)
then place a checkmark in rock column

loop (20) times
if opponent shows (paper)
then place a checkmark in paper column

loop (20) times
if opponent shows (scissors)
then place a checkmark in scissors column

Round	Rock	Paper	Scissors
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

Questions Answer the questions below.

1) Describe a pattern you found in your opponent's choice during the game.	
2) Based on the way the game ended, which option do you think your opponent will play next?	
3) If a computer program automated this data collection, how would it help you in winning rock, paper, scissors?	

Name _____ 207

Using Subprograms in Coding

A **subprogram** is a small set of instructions that does one specific job. You can reuse it whenever you need that job done again. It helps keep your code neat and saves time.

For example, if you're programming a robot to turn around, you could make a subprogram called **TurnAround**. Then, instead of writing the turn steps every time, you just call **TurnAround** whenever the robot needs to spin.

Instructions

...subprograms to write efficient code that gets the robot to pick up the ...rd return them to the toy bin. The robot can only handle one toy at a ... may be more than one toy at each location (x2, x3, etc.)

1) Pick up 2 guitars and 3 drums and return them to the toy bin.

Name: _____ 208

2) Pick up 2 cars, 4 dice, and 2 yo-yos and return them to the toy bin.

3) Pi[illegible]ment in the room (including the trophies) and return them to the toy

4) Pick up all the remaining things in the room and return [illegible]

Name: _____ 209

Using Subprograms in Coding

In this activity, you'll write a simple program that:

- Collects data about heartbeats and time (in minutes)
- Plots that data as coordinate points
- Calculates the average number of heartbeats per minute using a subprogram

You will record your heart rate each minute for 10 minutes. Then you'll write a program with subprograms to collect this data and translate it onto a graph.

How-To-Gu ollow the guide below to write your computer program.

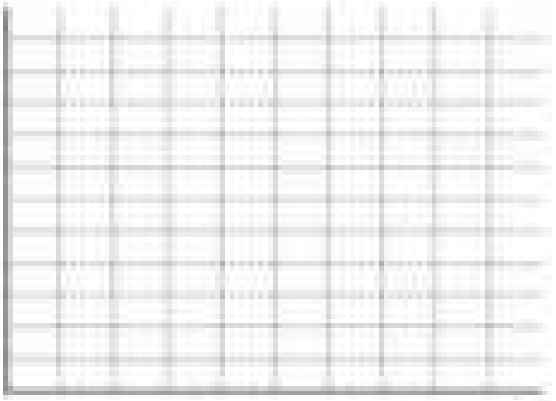
Step		Suggestions / Hints
1	Create **each point** ap	Use inputs like **numBeats** and **numMinutes**. Call your subprogram something like **plotPoints**. Plot (minutes, beats).
2	Create a subprogram **calculate the average be per minute**.	de the total by 10. You could **ca tsPerMinute**.
3	In the main program, **set up a loop to repeat 10 times**.	Use a r time command to collect
4	Inside the loop, **ask the user to input two values**.	Ask for beats Store them as variables like **numB**
5	**Run the point-plotting subprogram** each time.	Call your **plotPoints** subprog loop.
6	**Keep track of the total beats per minute** as the loop runs.	Each time, calculate **numBeats** / **numMinutes** and add it to a total variable (e.g. **totalBeatsPerMinute**). You can then divide it by 10 as this was done over 10 minutes.
7	After the loop, **run the average calculation subprogram**.	This should calculate the average from the total. Use your **calcAvgBeatsPerMinute** subprogram here.
8	**Display the average beats per minute**.	Use an output command. Show something like: "The average heartbeat per minute is" followed by your answer.

Name: _____ 210

Instructions Collect your heart rate every minute for 10 minutes. Record it below and graph it after you finish writing your code.

Minutes	Heart Rate
1	
2	
3	
4	
5	

Minutes	Heart Rate
6	
7	
8	
9	
10	



Instructi ...ode below in the blank space.

Name: _____ 211

Using Subprograms in Coding

In this activity, you're going to create a program that calculates how much a group will pay for concert tickets. You'll ask the user to enter how many people are going, how much each ticket costs, and then use subprograms to calculate the total price, apply tax, and display the final amount.

How-To-Guide Follow the guide below to write your computer program.

Step	What to Do	Suggestions / Hints
1	Create a subprogram that calculates the total before tax.	This should multiply two values the user provides. Think about what those values represent.
2	Create a subprogram that applies a tax to the total.	The tax rate for Ontario is 13%.
3	Ask the user to input two different values related to the purchase.	Think about what information you would need if you were buying tickets for a group.
4	Use the first subprogram to calculate the total based on user input.	Store the result in a variable.
5	Use the second subprogram to apply tax to the total.	The new result should represent the amount the user needs to pay.
6	Display the final result to the user in a clear message.	Include helpful wording so the user understands what the total means.
7	Test your program with different numbers to check if it works.	Try it with small and large values to make sure the logic still makes sense.
8	Review your subprograms to make sure they're reusable and named clearly.	Could you use them again in a different situation, like buying snacks or shirts?

Name: _____ 212

Instructions	Write your code below in the blank space.

Test	Test your program by explaining what would happen at each st[illegible] the program using values you make up - # of tickets, cost, total co[illegible]h tax.

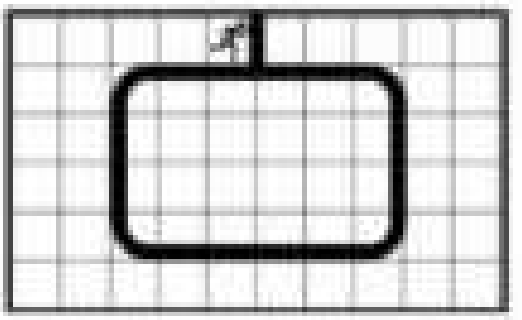
Name: _____ 215

Unit Test - Coding

Part 1 Write code that sends the runner around the track.

Use a loop to send the runner 5400 metres.

Line 1: _____
Line 2: _____
Line 3: _____
Line 4: _____
Line 5: _____
Line 6: _____
Line 7: _____



1 Lap = 450 metres

Part 2 Write what the computer would say based on the code written.

Code Written	The Computer Replied
$y = 45$ $x = y + 92$ print (x)	
$x = 150$ $x + y = 11 - 5$ print (y)	

Code Written	The Computer Replied
$3y$ print	
$x = 48$ $x + y + 20 = 32$ print (y)	

Part 3 Calculate the answer to the question and then run the code.

Code Written	The Computer Prints...
If student mark (m) is ≥50%, then print "You passed" If student mark (m) is <50%, then print "You failed" run $m = \frac{15 + 13 + 12}{45}$	
If player has >50 points (p), then print "You win" If player has <50 points (p), then print "You lose" run $p = 15 \times 3 - (-10)$	

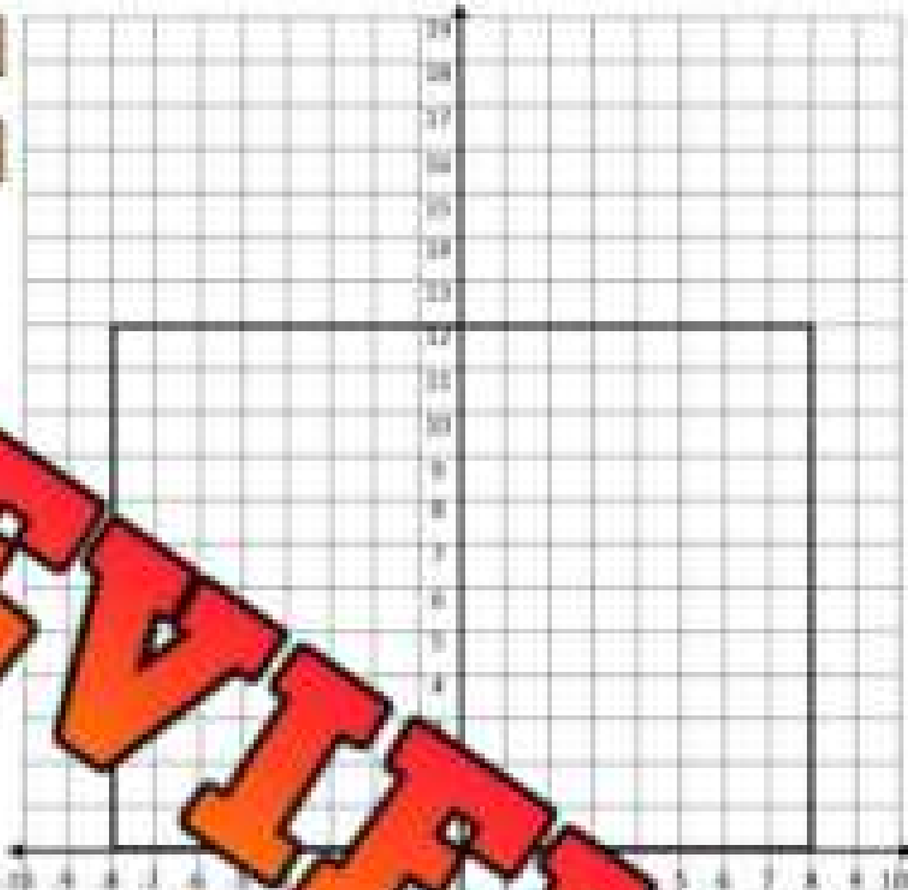
Directions | Use the data to program Ronaldo's shots on goal.

Cristiano Ronaldo is a professional soccer player. His shots on goal that were saved and his shots on goal that went in for his last 10 games are displayed in the table below. The coordinates show where his shots were aimed.

Program

If the shot is (scored)
then plot a green dot using the coordinates
If the shot is (saved)
then plot a red [illegible] using the coordinates

Shots Sc[illegible]	[illegible]Shots Saved
[illegible]	[illegible]
[illegible]	[illegible]
(7, 11)	[illegible]
(6, 1)	[illegible]5)
(-7, 1)	[illegible]
(-6 ,11)	(4, 5)
(7, 1)	(0, 4)
(-6, 10)	(5, 7)
	(-4, 5)
	(2, 2)



Questions | Answer the questions below

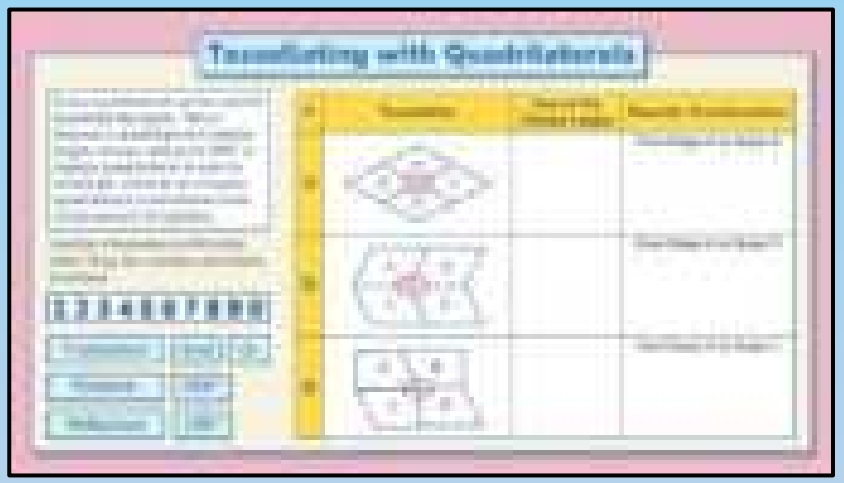
1) How many goals did Ronaldo score in the 10 games?	
2) Ronaldo plays tomorrow, do you think he will score in the game? Is it likely, unlikely, certain, or impossible?	
3) What patterns did you notice from Ronaldo's shots? List at least 2.	
4) Ronaldo has asked you where he should shoot on goal. Use the data from the program to give him at least 2 tips.	

Google Slides Lessons Preview

Ontario Math
Spatial Sense Unit – Grade 8

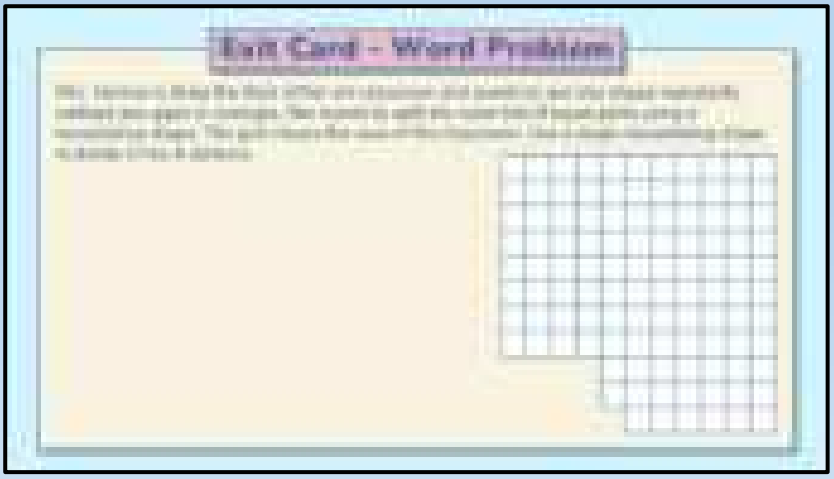
3-Part Lesson Format

Part 1 – Minds On!
- Learning Goals
- Discussion Questions
- Why Math Is Important
- And More!



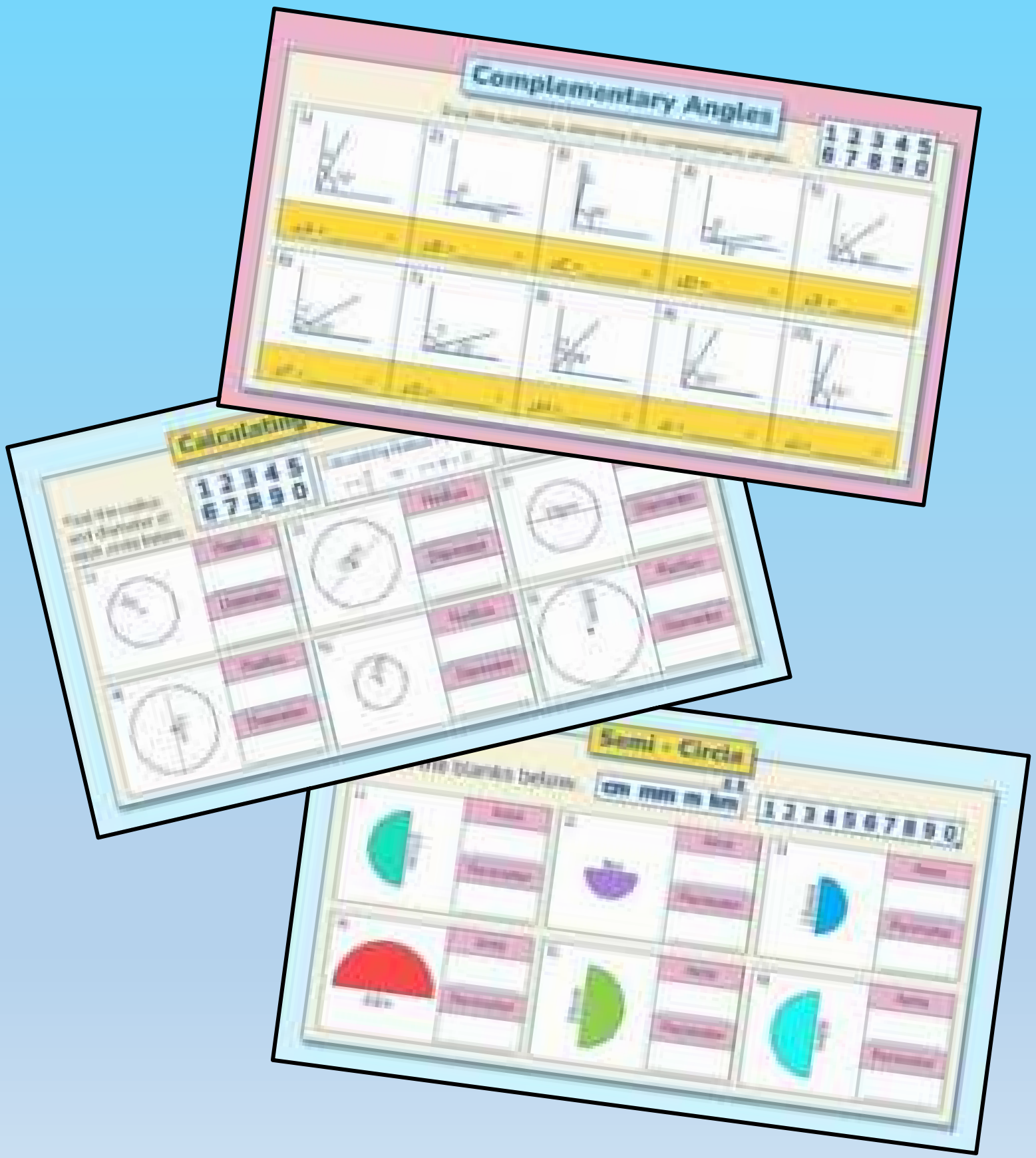
Part 2 – Action!
- Questions
- Matching
- Drag and Drop
- Videos
- And More!

Part 3 – Consolidation!
- Exit Cards
- Word Problems
- Quizzes
- Student Created Quizzes



Ontario Math
Spatial Sense Unit – Grade 8

Ontario Math
Spatial Sense Unit – Grade 8



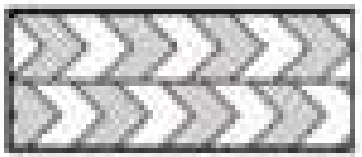
Workbook Preview

Grade 8
E1 – Geometric and Spatial Reasoning

	Curriculum Expectations	Pages That Cover the Expectations
E1.1	identify geometric properties of tessellating shapes and identify the transformations that occur in the tessellations	5 - 20
E1.2		
E1.3	use scale drawings to calculate actual lengths and areas, and reproduce scale drawings at different ratios	47 - 66
E1.4	describe and perform translations, reflections, rotations, and dilations on a Cartesian plane, and predict the results of these transformations	67 - 116

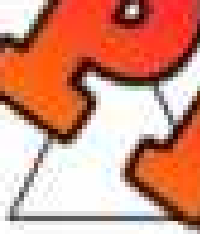
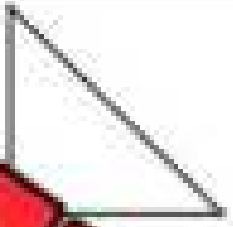
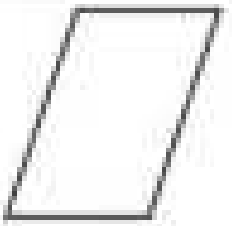
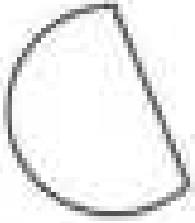
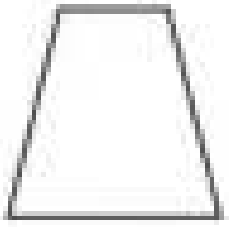
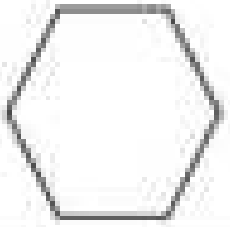
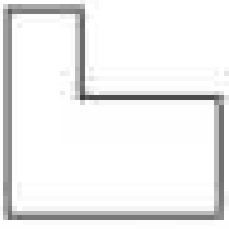
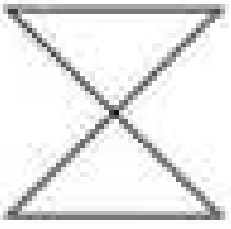
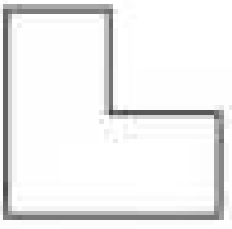
Name: _____ 5

Intro to Tessellations



A **tessellation** is a tiling pattern in which shapes are fitted together with no gaps or overlaps. In the example tessellation, a white and grey chevron are tiled with no gaps and are not overlapping.

Questions Can the shapes below be used by themselves in a tessellation?

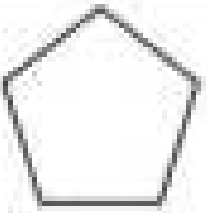
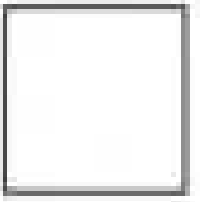
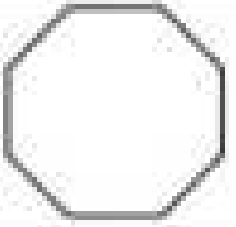
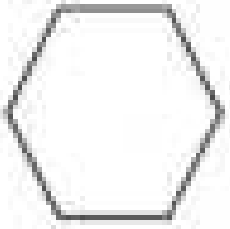
		
1) Yes No	2) Yes No	3) Yes No
		
4) Yes No	5) Yes No	6) Yes No
		
7) Yes No	8) Yes No	9) Yes No
		
10) Yes No	11) Yes No	12) Yes No

Name: _____ 6

Regular Polygons That Tessellate

A **regular polygon** is a shape that has equal sides and equal angles. There are only 3 regular polygons that can form tessellations by themselves. Other regular polygons can be used together to form a tessellation.

Part 1 Will the regular polygon tessellate?

		
1) Yes No	Yes No	3) Yes No
		
4) Yes No	5) Yes	Yes No
		
7) Yes No	8) Yes No	9) Yes No

Part 2 Describe the 3 regular polygons that will tessellate

Regular Polygon	Number of Sides	Angle Measurements	Interior Angle Total
1)			
2)			
3)			

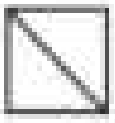
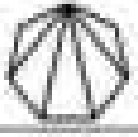
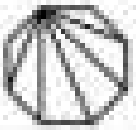
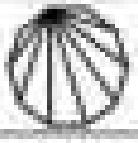
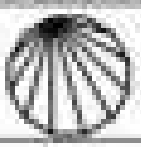
Name: _____ 1

Tessellating with Regular Polygons

Polygons will only tessellate if their interior angles add up to a multiple/factor of 360°. A triangle's interior angles always add up to 180°.

Instructions Use the information above to fill in the tables

Terms	Definition – What does the term mean?
Regular P	
Interio	
Su	

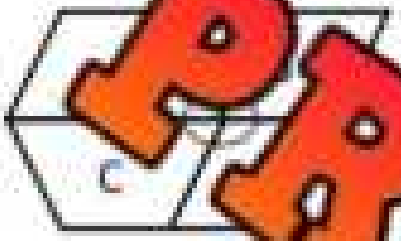
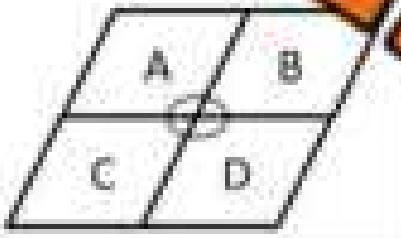
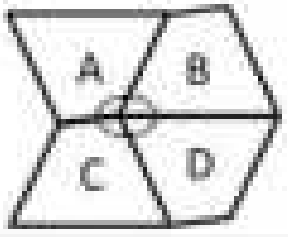
Regular Polyg	Triang	Sum of Interior Angles (# of Triangles x 180)	Multiple/Factor of 360° Yes/No
1) 			
2) 			
3) 			
4) 			
5) 			
6) 			
7) 			
8) 			

Name: _____ 8

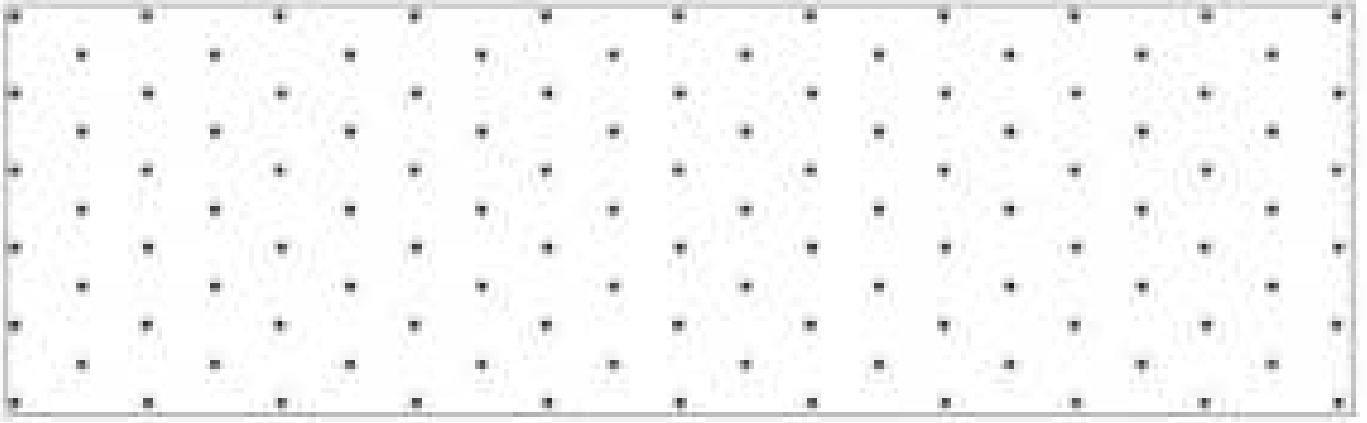
Tessellating with Quadrilaterals

Every quadrilateral can be used to tessellate the plane. This is because a quadrilateral's interior angles always add up to 360°. A *regular* quadrilateral is easy to tessellate, whereas an irregular quadrilateral is sometimes more challenging to fit together.

Part 1 Fill in the table below

Tessellation	Sum of the Circled Angles	Describe Transformation
		*From Shape A to Shape D*
		*From Shape A to Shape B*
		*A to Shape C*

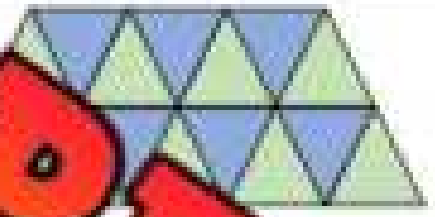
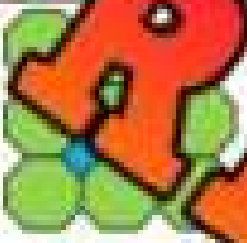
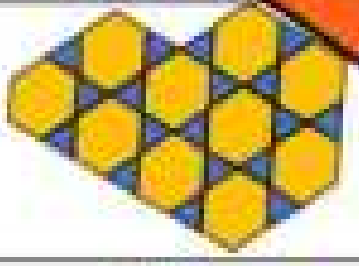
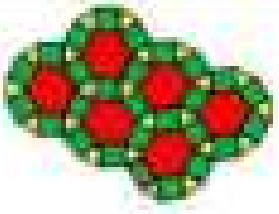
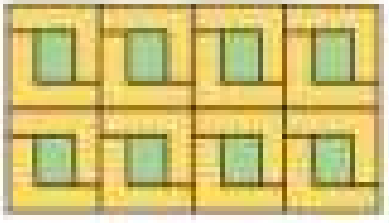
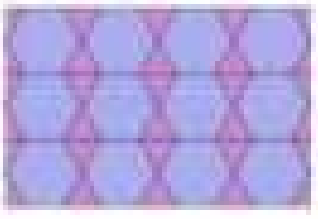
Part 2 Create a tessellation using one or multiple quadrilaterals



Name: _____ 14

Types of Tessellation

Questions What type of tessellation are the examples below?

Tessellation	Type of Tessellation Regular, Semi-Regular, Irregular
1) 	
2) 	
3) 	
4) 	
5) 	
6) 	

Name: _____ 16

Creating Translation Tessellation

Directions Follow the instructions to create your own translation tessellation

When creating a tessellation, we move a "tile" repeatedly to create a pattern. We can move the tile in 4 different ways – translations, reflections, rotations, and dilations.

A **translation tessellation** is a tessellation that has been created by the translating (sliding) of a tile.

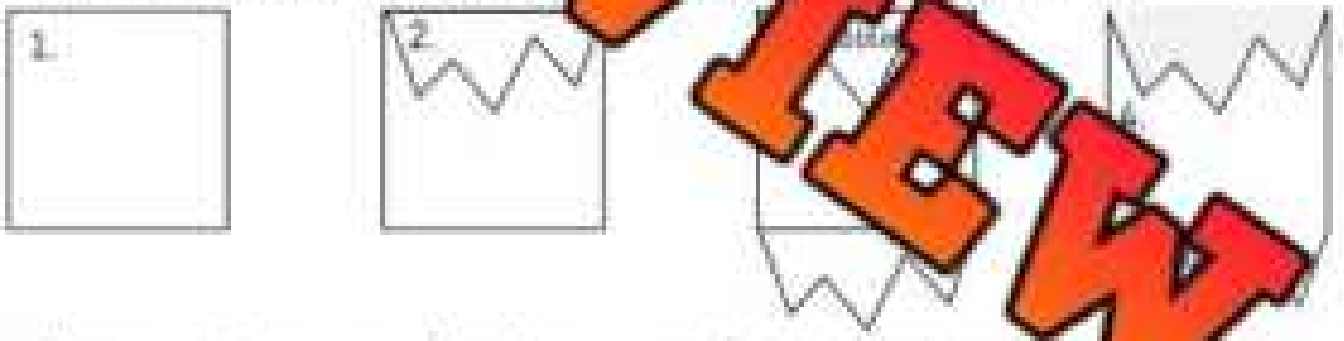
Instructions

1) Use [illegible] with strong paper, like cardboard, cardstock or index cards.

2) [illegible] pencil from one corner of the square to an adjacent corner. [illegible] and do not stop halfway.

3) Cut along your [illegible] have two pieces. The piece that you designed is called [illegible]

4) Translate (slide) the [illegible] and tape the straight edges together. These two pieces need [illegible] overlapping.

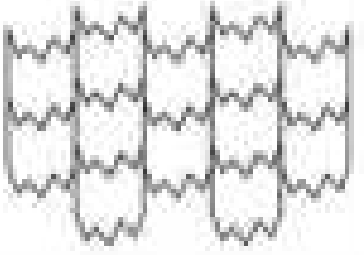


5) Place your tile on one of the four corners. To avoid having gaps, [illegible] corner of the paper align with the original square you started with. The [illegible] you trace can hang off the edge of the paper.

6) Since this is a translation tessellation, you will translate (slide) the tile so that it fits together like a puzzle.

7) Continue translating the tile until the page is covered.

8) Colour your tessellation in a pattern



Name: ______________________ 18

Creating Rotational Tessellation

Directions Follow the instructions to create your own rotational tessellation

When creating a tessellation, we move a "tile" repeatedly to create a pattern. We can move the tile in 4 different ways – translations, reflections, rotations, and dilations.

A **rotational tessellation** is a tessellation that has been created by the rotating (turning) of a tile.

Instructi[illegible]

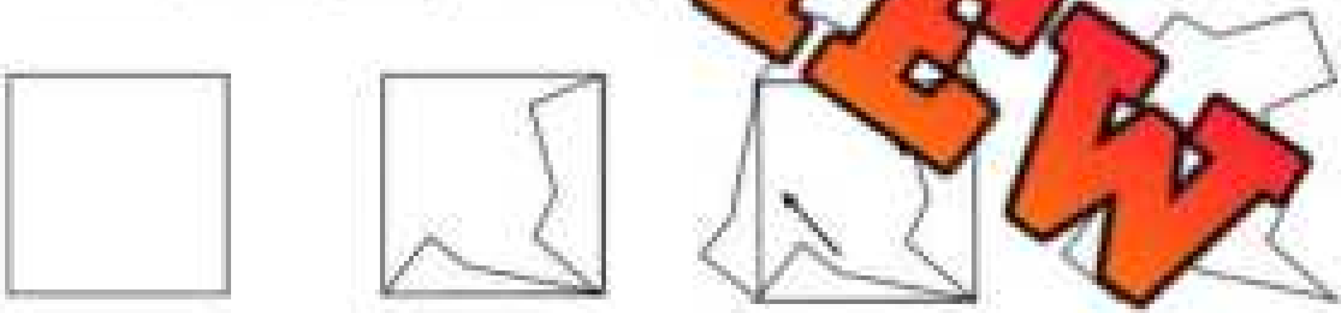
1) Us[illegible] with strong paper, like cardboard, cardstock or index cards.

2) C[illegible] a de[illegible] pe[illegible]il from one corner of the square to an adjacent corner. T[illegible] e[illegible] rt, such as a bird or other animal. Do not draw diagonal[illegible] st[illegible]

3) Repeat the step [illegible] you[illegible] designs to cut out

4) Cut both designs out. You[illegible] d [illegible]

5) **Rotate** the cut-out pieces by turn[illegible] em to [illegible] sides – do not flip them. Tape the edges together making su[illegible] line[illegible] overlapping.

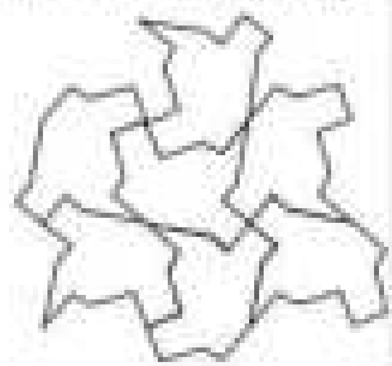


6) Place your tile on one of the four corners. To avoid having gaps, have the corner of the paper align with the original square you started with. The first tile you trace can hang off the edge of the paper.

7) Rotate (turn) the tile to fit it next to your original tile.

8) Continue rotating the tile until the page is covered.

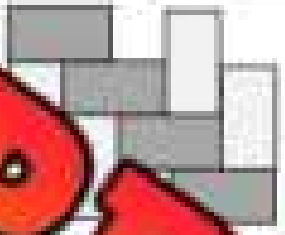
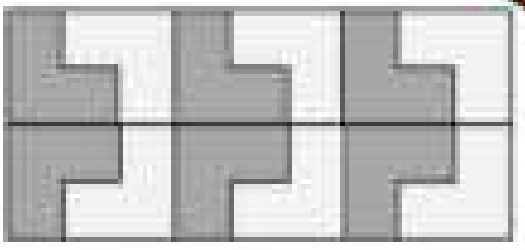
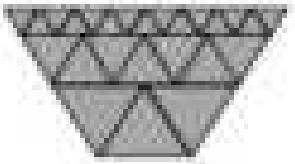
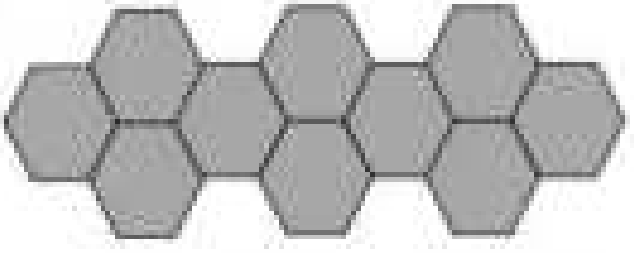
9) Colour your tessellation in a pattern



Name: _____ 19

Describing Tessellations

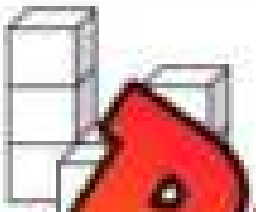
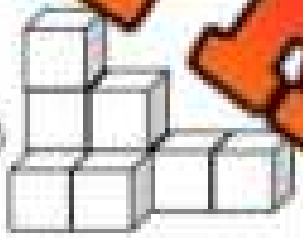
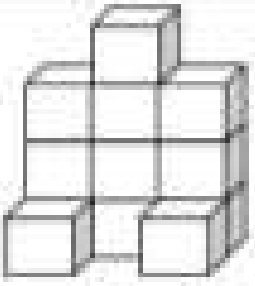
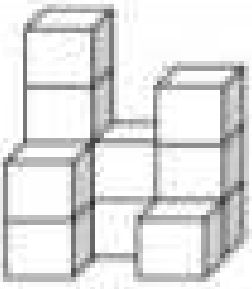
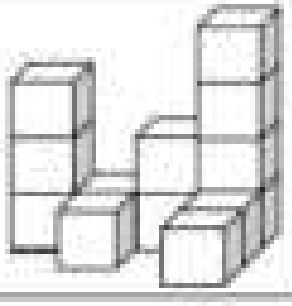
Directions Choose one tile and describe how it is being transformed – rotated, translated, reflected and/or dilated

Tessellation	Description
1) 	
2) 	
3) 	
4) 	
5) 	

Name: _____ 21

Drawing Top, Front, and Side Views of Objects

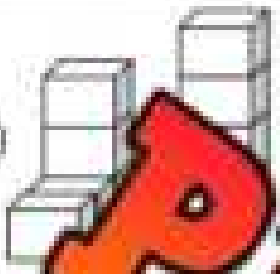
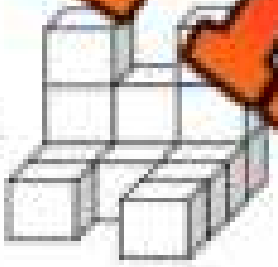
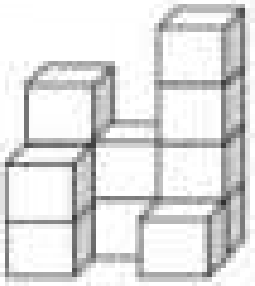
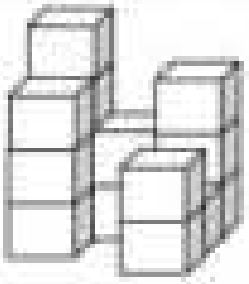
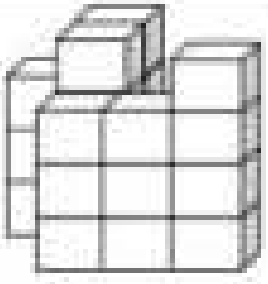
Instructions Draw the top, front, and side view of the objects below

Original Shape	Top View	Front View	Side View
1) 			
2) 			
3) 			
4) 			
5) 			

Name: _____ 23

Drawing Top, Front, and Side Views of Objects

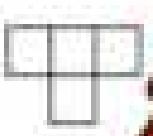
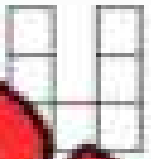
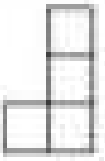
Instructions Draw the top, front, and side view of the objects below

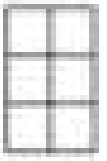
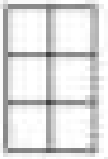
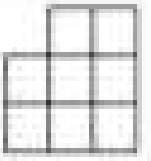
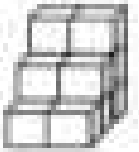
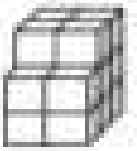
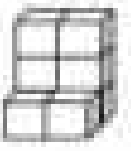
Original Shape	Top View	Front View	Side View
1) 			
2) 			
3) 			
4) 			
5) 			

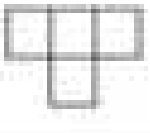
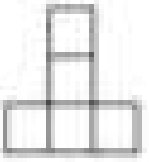
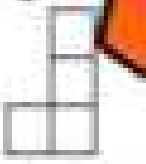
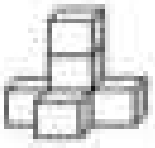
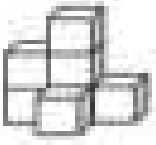
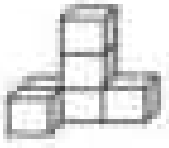
Name: _____ 25

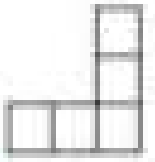
Drawing Top, Front, and Side Views of Objects

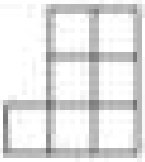
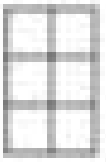
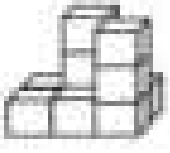
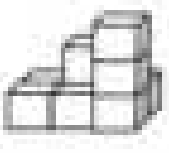
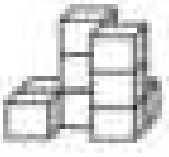
Instruction Look at the front, top, and side views and circle the matching 3D object

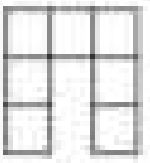
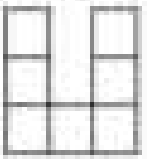
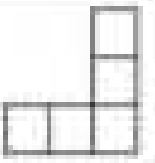
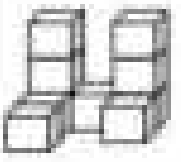
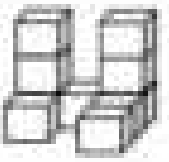
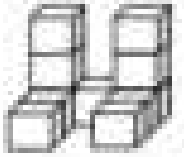
1) Top View	Front View	Side View
		
		

2) Top View	Front View	Side View
		
		

3) Top View	Front View	Side View
		
		

View	Front View	Side View
		
		

5) Top View	Front View	Side View
		
		

6) Top View	Front View	Side View
		
		

Name: _____ 27

Drawing Top, Front, and Side Views of Objects

Instruction Draw the 3D objects by using the top, front, and side views

Top View	Front View	Side View

1)

Top View	Front View	Side View

2)

Top View	Front View	Side View

3)

Top View	Front View	Side View

4)

Top View	Front View	Side View

5)

Top View	Front View	Side View

6)

Name: _____ 35

Drawing Perspective Views - Boxes

Questions

1) Connect the corners of the boxes to the vanishing point
2) Draw the sides of the boxes with horizontal lines and vertical lines

Name: _____ 38

Perspective Drawings – Stars

Questions

1) Connect the corners of the stars to the vanishing point
2) Draw the sides of the stars parallel to the shape of the star

Name: _____ 39

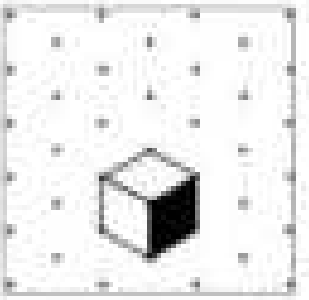
Perspective Drawings – Real-Life Objects

Questions

1) Connect the corners of the objects to the vanishing point
2) Draw the sides of the objects with parallel lines

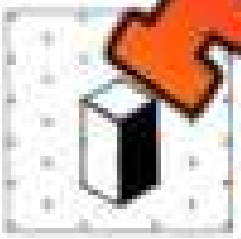
Name: _____ 40

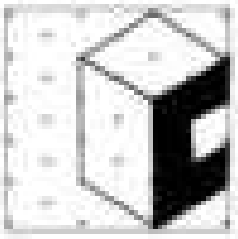
Isometric Projections

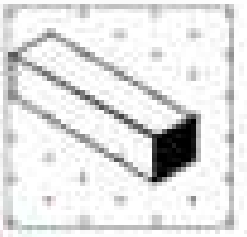


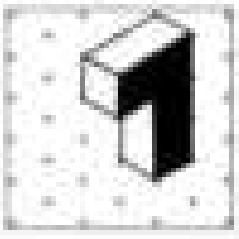
Isometric projections are drawn on a triangular grid. They are used to represent 3D objects in a 2D drawing. The projections show all lengths in the same scale, including the lines that show depth. However, angles are distorted to create the appearance of perspective. Therefore, a 90° angle in real life appears as 60° in an isometric projection.

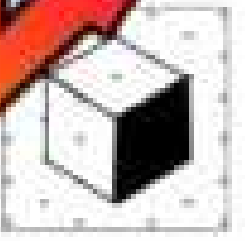
Questions Copy the 8 three-dimensional drawings using the isometric dot paper.

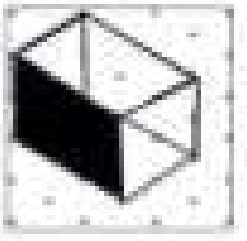








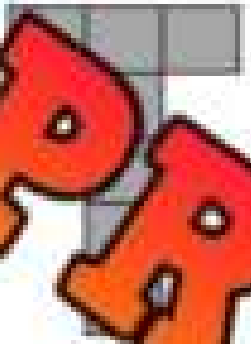
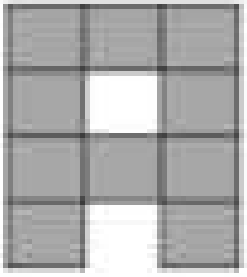
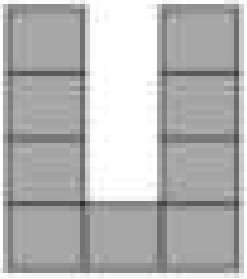




Name: _____ 42

Isometric Projections

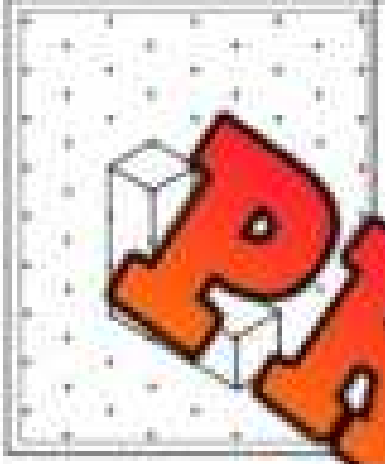
Questions Draw the isometric view of each letter. Use a scale of 1:1.

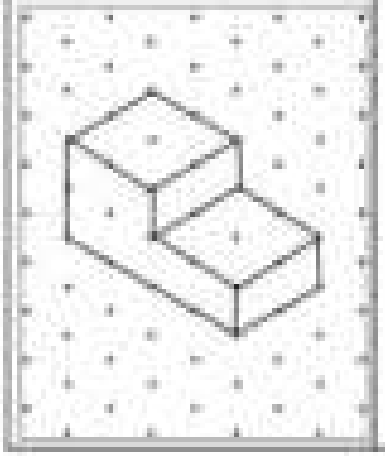
Letter	Front View	Isometric View
T		
A		
U		

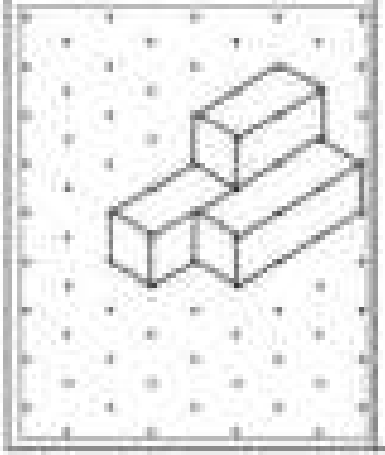
Name: _____ 43

Isometric Projections

Questions Draw the top, front, and side views of the isometric drawing

Isometric View	Top View	Front View	Side View
			

Isometric View	Top View	Front View	Side View
			

Isometric View	Top View	Front View	Side View
			

Name: _____ 44

Cavalier vs Cabinet Drawings

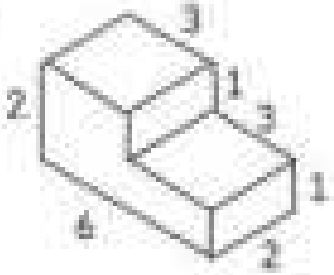
Cavalier Drawings – Full size – All 3 Dimensions
1) Draw the front view first
2) Use the same depth as the isometric view

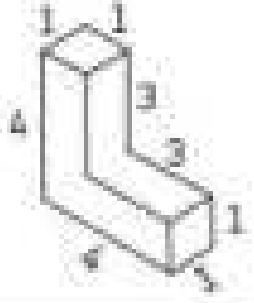
Cabinet Drawings – Depth is projected in half
1) Draw the front view first
2) Use half of the depth as the isometric view

Isometric View	Cavalier	Cabinet
Cube 		

Questions – Draw the top, front, and side views of the isometric drawing

	Cavalier	Cabinet
1) Cube 		

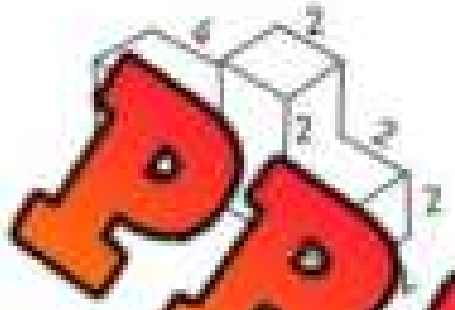
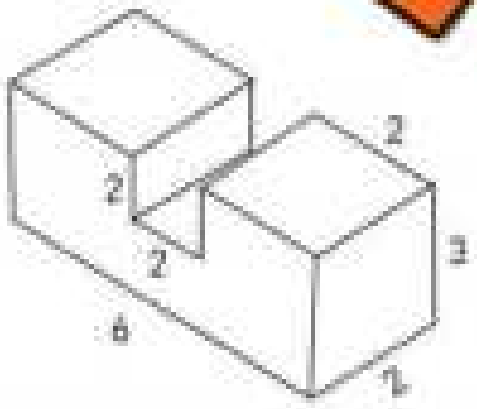
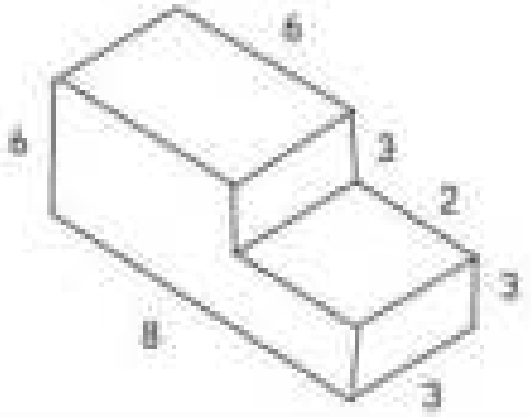
Isometric View	Cavalier	Cabinet
2) 		

Isometric View	Cavalier	Cabinet
3) 		

Name: _____ 65

Cabinet Projections

Questions Draw the top, front, and side views of the isometric drawing

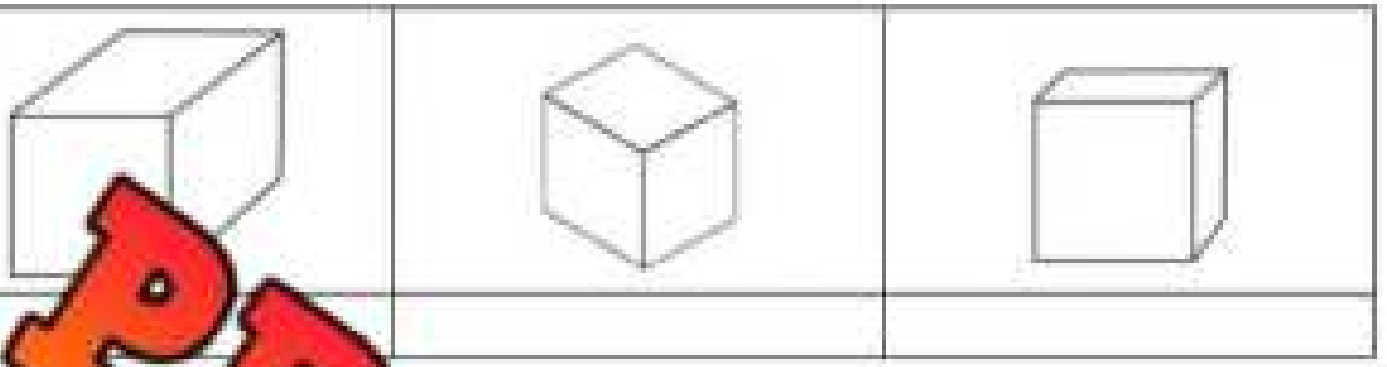
Isometric Drawing	Cabinet Drawing
1) 	
2) 	
3) 	

Name: _____ 46

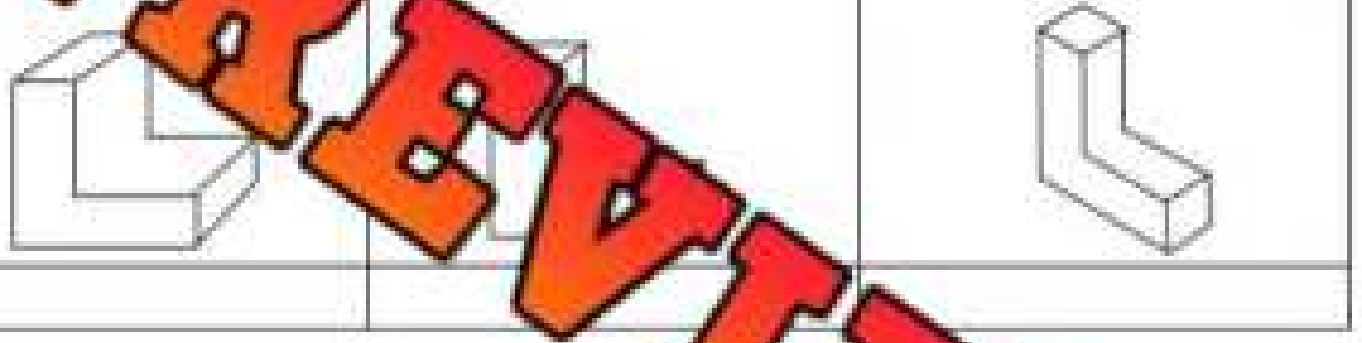
Different Drawing Types

Part 1 Label the drawings – isometric, cavalier, or cabinet

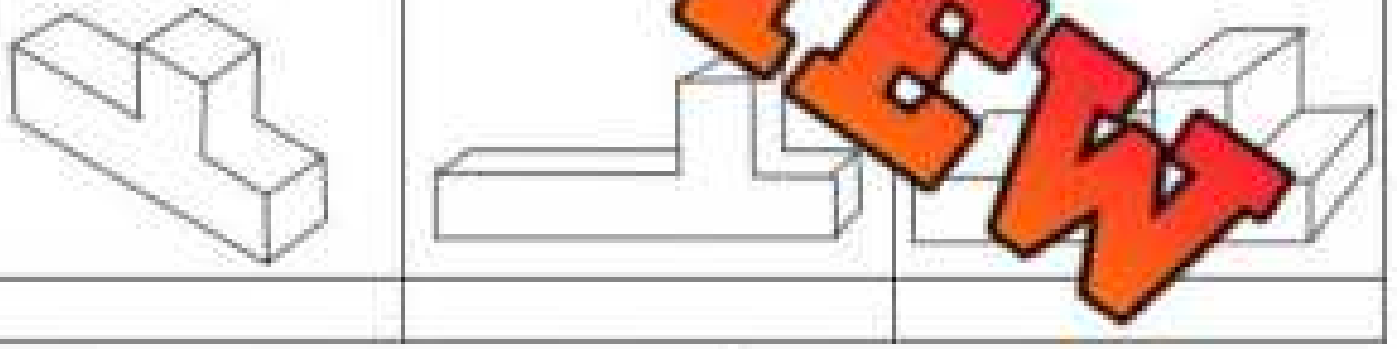
1)



2)



3)



Part 2 Answer the questions below

1) Which type of drawing uses the exact measurements – side lengths and angles?

2) Which type of drawing gives the most realistic representation? Explain.

Name: _____ 47

Scale Drawings

Scale Drawings
A scale drawing is used to draw a shape or object smaller or larger than the original but keeping the proportions the same. For example, the CN Tower is 553m tall. The tower on the right is to scale, with a scale of 1cm to 100m, or 1:10000.

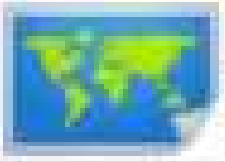
1cm:100m

Questions Answer the questions below

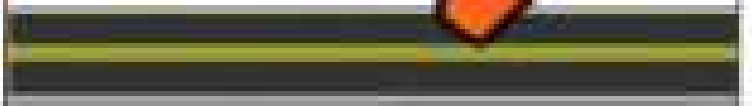
1) If [illegible] and 1cm equals [illegible]m, how long would the bridge be [illegible]

2) The dimensions of a house are 18m by 34m. If one cm equals 2m, what are the scaled dimensions of the house?

3) If one cm equals 250km on a map, how many centimetres would be used to represent 3000km?



4) [illegible] is 660km. If 1cm [illegible] would represent [illegible] road?



5) Dimensions of a building are 120m by 90m. If one cm equals 15m, what are the dimensions of the building?

6) If one cm equals 18km on a map, how many cm would be used to represent 162km?

Name: _____ 48

Scale Drawings

Questions | Answer the questions below

1) An engineer used a scale of 1cm:20m to design a city park. The park will be 360m by 140m. What should the dimensions of the park be on the map?

2) A [illegible] been drawn to scale. The height of the building on the map is [illegible] is 4cm to 6m. What is the height of the building in real-life?

3) An artist builds a model of a car t[illegible] 25cm long. The scale is 1cm to 25cm.

a) What is the length of the car in centime[illegible]

b) What is the length of the car in metres?

4) The height of a tree is 11 metres tall and 2.5 metres wide. L[illegible]w it to scale so she chooses a scale of 1cm to 0.5m. What will the dimen[illegible] the tree be on her page in centimetres?

5) Carter is figuring out the distance to drive from Toronto to Ottawa on a map. The scale is 1cm to 100km. The distance on the map is 4.6cm. What is the distance from Toronto to Ottawa in kilometres?

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

Name: _____

Questions: Answer the questions below

1) A road map uses a scale of 1 cm to 15 km. The distance between two cities on the map is 7.8 cm. What is the actual distance between the two cities?

2) A blueprint of a house has a scale of 1 cm to 5 m. If the living room measures 4.5 cm by 6 cm on the blueprint, what are the real-life dimensions of the living room?

Name: _____

Questions: Answer the questions below

1) A road map uses a scale of 1 cm to 15 km. The distance between two cities on the map is 7.8 cm. What is the actual distance between the two cities?

2) A blueprint of a house has a scale of 1 cm to 5 m. If the living room measures 4.5 cm by 6 cm on the blueprint, what are the real-life dimensions of the living room?

Name: _____ 50

Drawing Buildings Using Scale Factors

Questions Use the grid to draw the dimensions of the buildings

1 square = 1cm

1) A building's base is 36m wide and 54m long. Use a scale of 1cm to 6m.

2) A [illegible] has the following dimensions: 90m by [illegible]m. Use a scale of 1cm to 10m.

3) A chocolate bar is 35cm long and [illegible]cm wide. Use a scale of 1:5 to draw the chocolate bar on the grid.

4) A phone is 15cm by 8cm. Use a scale of 1:2 to draw the phone on the grid.

5) A book is 18cm by 28cm. Use a scale of 1:4 to draw the book on the grid.

Name: _____ 52

Creating Scaled Drawings

Questions Draw the objects on the grid by choosing an appropriate scale: 1 square = 1cm

1) Building 1: 16m by 12m	Building 2: 24m by 32m	Building 3: 56m by 22m
Car: 2m by 4m	Transport: 2m by 10m	Parking lot: 26m by 16m

Scale: _____

2) Building 1: 48m by 18m	Building 2: 78m by [illegible]	[illegible]2m by 30m
Parking lot 1: 9m by 18m	Parking lot 2: 24m by 36[illegible]	[illegible] by 54m

Scale: _____

Name: _____ 53

Determining the Scale

Questions | Answer the questions below

1) A park is 54m long and 24m wide. A scaled drawing was created to represent the park.

What scale was used in the drawing?

2) A [illegible] dimensions: 117cm by 56cm. A scaled drawing was created to represent it.

What scale was used in the drawing?

3) A tabletop has the following dimensions: 102cm by 48cm. A scaled drawing was used to represent the tabletop.

What scale was used in the drawing?

4) A computer monitor is 100cm wide and 60cm tall. A scaled drawing was used to represent the monitor.

What scale was used in the drawing?

5) The distance from Yellowknife to Toronto is 4,250km. Vincent measured the distance on a map and determined it was 8.5cm.

What scale was used on the map?

Name: _____ 56

Using Scale on Map of Canada

Questions | Print this using default settings to achieve a friendly scale

Name: _____ 57

Using Scale on Map of Canada

Use the legend on the map of Canada to determine the distances between cities.

1) Measure the length of the scale provided on the legend. Use the kilometre measurement (not miles).
2) Determine the scale by comparing the length of the line to the measurement provided.

For example: km 0 100 200 300

The length of the line is 3cm total. This means 1cm = 100km.

Question: Use the scale to determine the distance from city to city

	City 1	City 2	Distance - cm	Distance - km
1)	Toronto	[illegible]		
2)	Winnipeg	[illegible]		
3)	Victoria	Regina		
4)	Kingston	Saskatoon		
5)	Vancouver	Charlottetown		
6)	Prince Rupert	St. John's		
7)	Calgary	Timmins		
8)	Thunder Bay	Moncton		
9)	Sudbury	Whitehorse		
10)	Dawson City	Brandon		
11)	Edmonton	Yellowknife		
12)	Iqaluit	Montreal		
13)	Halifax	Fort McMurray		

Name: _____ 58

Calculating Area Using Scale Drawings

We can determine the area of region or object by using its scaled dimensions. We do this by determining the actual dimensions and then using them in the formula for area - length times width (A = L x W)

Example: A park is 8cm by 9cm on a map. The scale is 1cm:20m.

Actual Dimension: 160m x 180m

Area = 160 x 180 = 28 800 m^2

Questions Calculate the area using the scaled dimensions

1) A drive[illegible]cm by 8cm on a scaled drawing. The scale is 1cm:12m. What is the actual a[illegible]eway?

2) A TV has been d[illegible] by 9cm. The scale is 1cm:8cm. What is the actual area of the T[illegible]

3) You are deciding whether to buy the lates[illegible] bu[illegible]w the area of it. A scaled drawing shows it is 8mm by 4mm. Th[illegible]hat is the actual area of the phone?

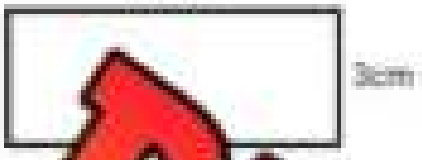
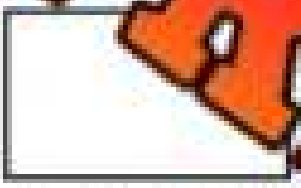
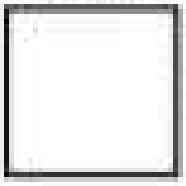
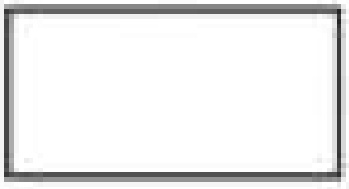
4) A painting you are thinking of buying online has been drawn to sc[illegible]ith the following dimensions: 9cm by 16cm. The scale in centimetres is 1:12. What is the actual area of the painting?

5) Neill is buying a lot to build his house on. He has seen a scaled drawing of the lot that measured 14cm by 22cm. The scale used was 1cm to 4m. What is the area of the lot?

Name: _____ 60

Calculating Area Using Scale Drawings

Questions | Fill in the table below

Scaled Drawing	Area of Scaled Drawing	Area of Actual Region
1) 		
2)  Scale = 1cm:8m		
3)  Scale = 1cm:10m		
4)  Scale = 1cm:20m		
5)  Scale = 1cm:1000m		

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

Name: _____

1) Calculating Area Using Scale Drawings

Scale = 1cm:3m

Area of Scaled Region = _____

2) A scaled blueprint of a rectangular park shows dimensions of 25 cm by 10 cm. The scale is 1 cm:5 m. What is the actual area of the park?

_____

Name: _____

1) Calculating Area Using Scale Drawings

Scale = 1cm:3m

Area of Scaled Region = _____

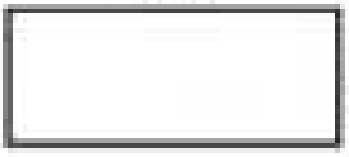
2) A scaled blueprint of a rectangular park shows dimensions of 25 cm by 10 cm. The scale is 1 cm:5 m. What is the actual area of the park?

_____

Name: _____

1) Calculating Area Using Scale Drawings

Scale = 1cm:3m



Area of Scaled Region = _____

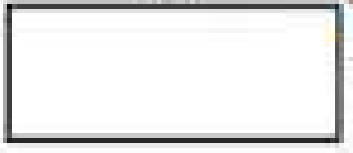
2) A scaled blueprint of a rectangular park shows dimensions of 25 cm by 10 cm. The scale is 1 cm:5 m. What is the actual area of the park?

_____

Name: _____

1) Calculating Area Using Scale Drawings

Scale = 1cm:3m



Area of Scaled Region = _____

2) A scaled blueprint of a rectangular park shows dimensions of 25 cm by 10 cm. The scale is 1 cm:5 m. What is the actual area of the park?

_____

Name: _____ 62

Calculating Area Using Scale Drawings

Questions | Answer the word problems below

1) A scale drawing for a park is shown below. The park has some greenspace and a basketball court. The scale in the drawing is 1cm to 5m.

a) What is the area of the basketball court?

b) What is the area of the greenspace park?

c) What is the area of the [illegible]

2) Courtney is painting a wall in her house. She [illegible] the wall that is shown below. The scale that was used in centimetres is 1:50.

a) What is the area of the wall in centimetres?

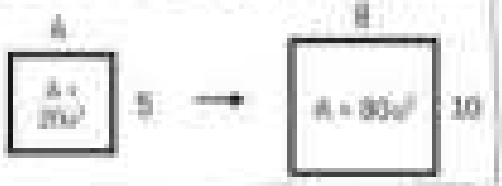
b) If the paint for the wall costs $5.35 to cover 1 metre of wall, how much will it cost Courtney to paint her wall?

Name: _____ 63

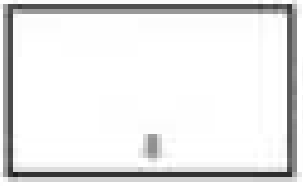
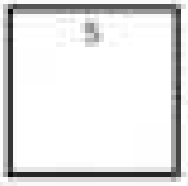
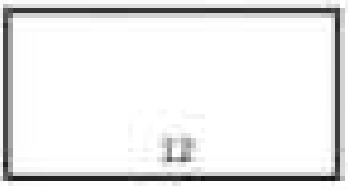
Area Using Scale Factor

A scale factor is the number by which all dimensions of an object are multiplied in order to create a proportionally larger or smaller representation. If the scale factor is a **whole number**, the representation will be **larger**. If the scale factor is a **fraction** or **decimal smaller than 1**, it will become **smaller**.

Example using 2 as scale factor:



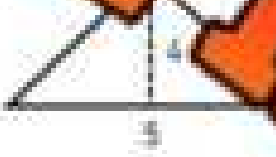
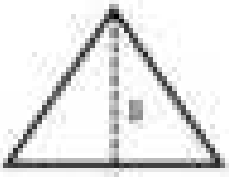
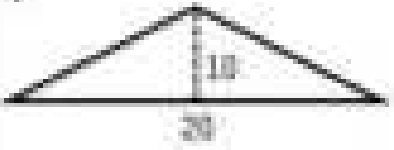
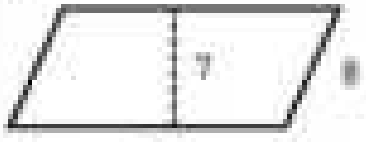
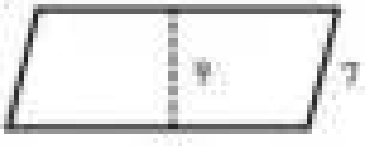
Questions Calculate the area of the original shape and the area of the scaled drawing

	Scaled Drawing
1) 	Scale Factor = 2 Area = _____
2)  Area = _____	Scale Factor = 4 Area = _____
3)  Area = _____	Scale Factor = 3 Area = _____
4)  Area = _____	Scale Factor = 0.5 Area = _____
5)  Area = _____	Scale Factor = 1/3 Area = _____

Name: _____ 64

Area Using Scale Factor

Questions Calculate the area of the original shape and the area of the scaled drawing

Original Shape	Scaled Drawing
1)  Area = _____	Scale Factor = 1/2 Area = _____
2)  Area = _____	Scale Factor = 4 Area = _____
3)  Area = _____	Scale Factor = 2 Area = _____
4)  Area = _____	Scale Factor = 1/2 Area = _____
5)  Area = _____	Scale Factor = 2 Area = _____
6)  Area = _____	Scale Factor = 3 Area = _____

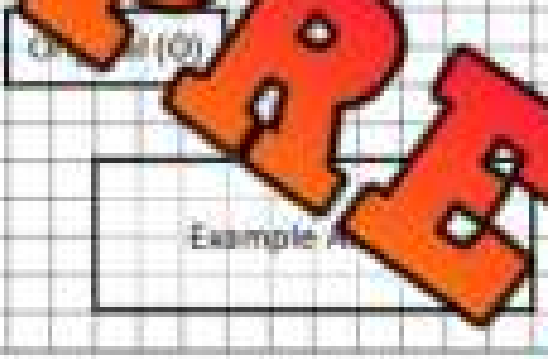
Name: _____ 67

Enlargement and Reductions

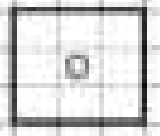
An **enlargement** is when we enlarge a shape by a scale factor to form a similar shape. A **reduction** is when we shrink a shape by a scale factor to form a similar shape. A **similar shape** is a shape that has the same angles and the side lengths have been changed proportionally. For example, if we change the length by 2 times, we change the width by 2 times as well.

Questions: the scale factor to perform enlargements/reductions of the original shape

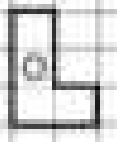
Ex.) Scale ... (enlarge 2 times)



1) Scale Factor = 1:2

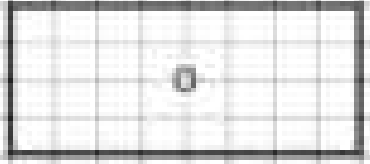


2) Scale Factor = 1:3

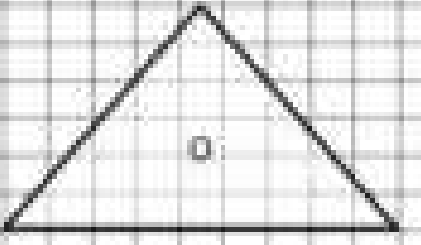


3) Scale Factor = 1:4

4) Scale Factor = 2:1 (reduction)



5) Scale Factor = 3:1



Name: _____ 69

Intro to Dilations

A **dilation** is a transformation that stretches or shrinks a figure by a certain scale factor. Unlike translations, reflections, and rotations, a dilation does not produce a congruent image. Instead, a dilated image produces a similar figure that has the same shape with equal angles and proportional side lengths.

When the scale factor is greater than 1, we are enlarging the original figure. If it is less than 1, we are reducing the original figure.

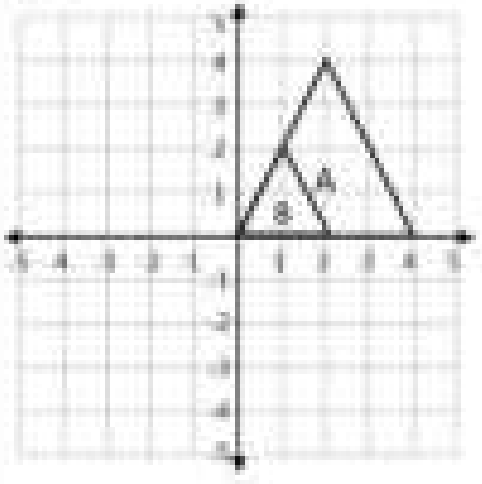
Part 1 S… a dilation with the given scale factor is a reduction or enlargement

	Scale Factor	Dilation Type
1)	k = …	
2)	k = 2	
3)	$k = \frac{1}{2}$	
4)	k = 0.5	
5)	k = 0.75	

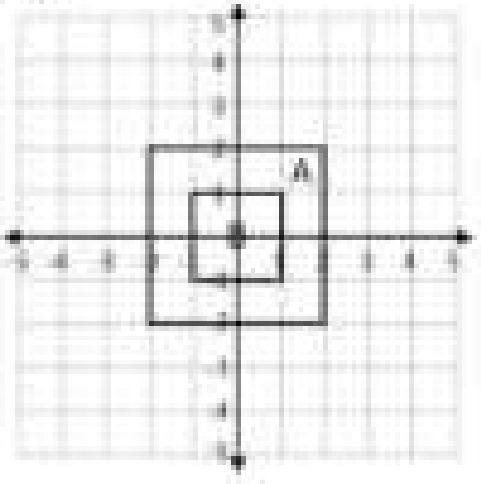
	Scale Factor	Dilation Type
6)	$k = \frac{5}{3}$	
7)	k = 5	
8)	k = 0.25	
9)	…	
10)	…	

Part 2 Is the dilation from figure A to B an enlargement or re…

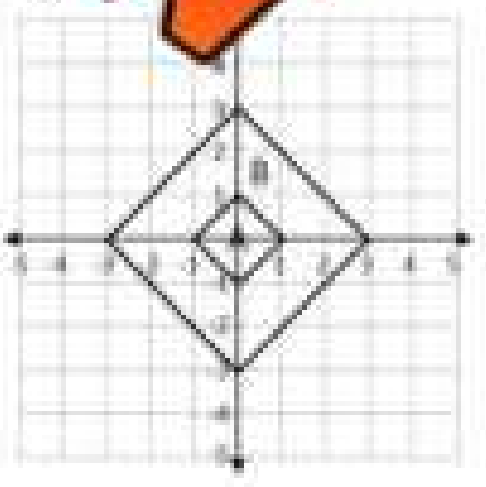
1)



2)



3)

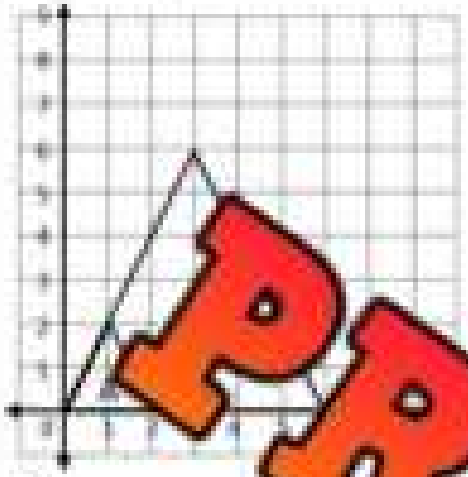


_____ _____ _____

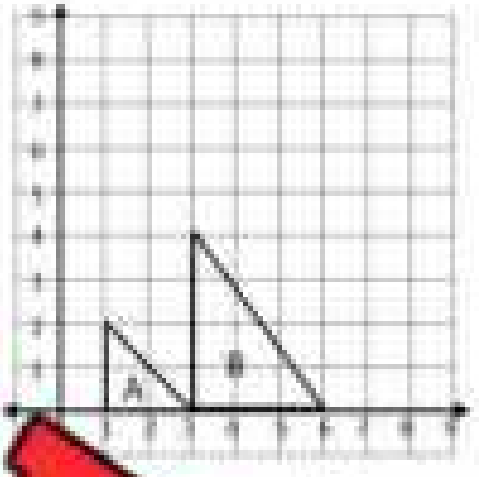
Name: _____ 70

Dilations – Determining Scale Factors

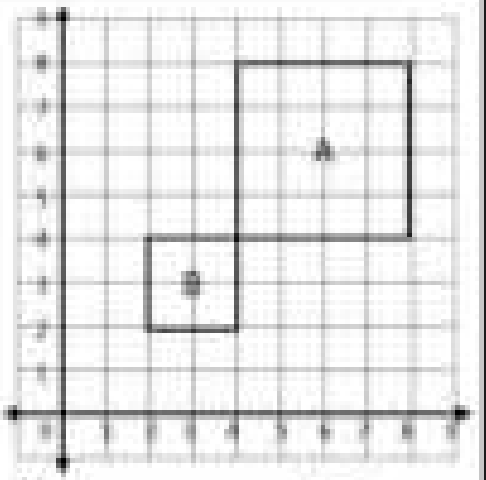
Questions Is the dilation from A to B an enlargement or reduction? What is the scale factor?



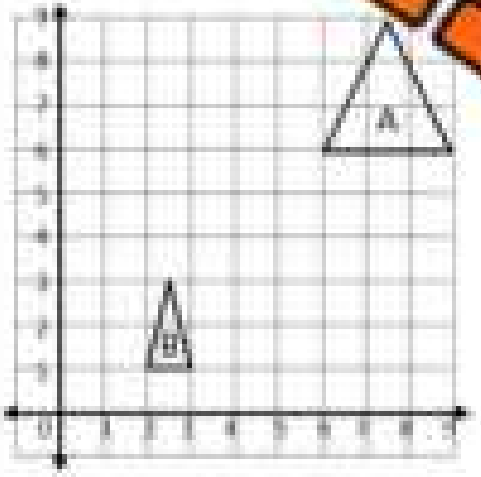
1) _____ k = ____



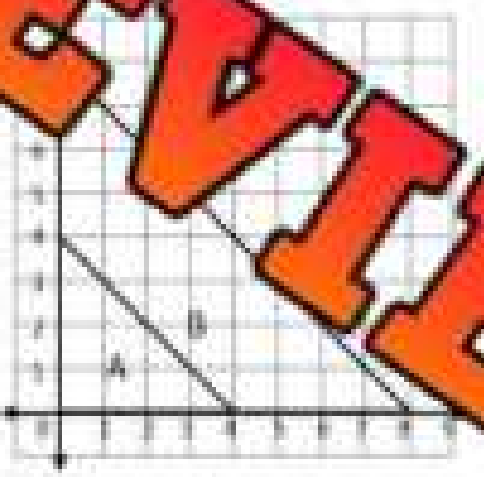
2) _____ k = ____



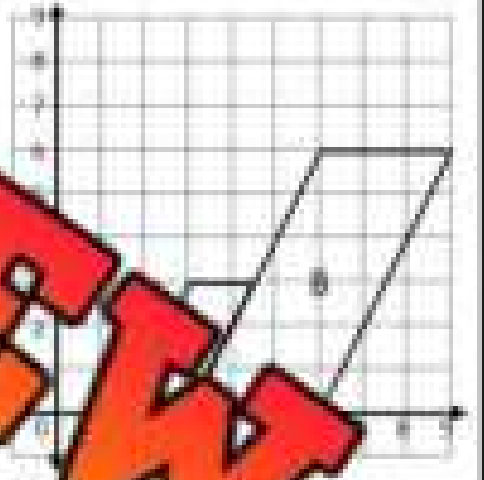
3) _____ k = ____



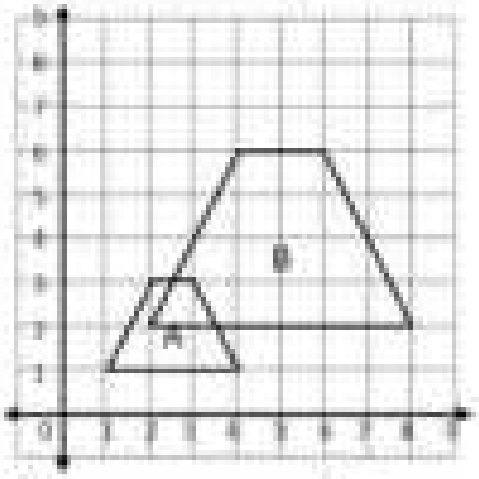
4) _____ k = ____



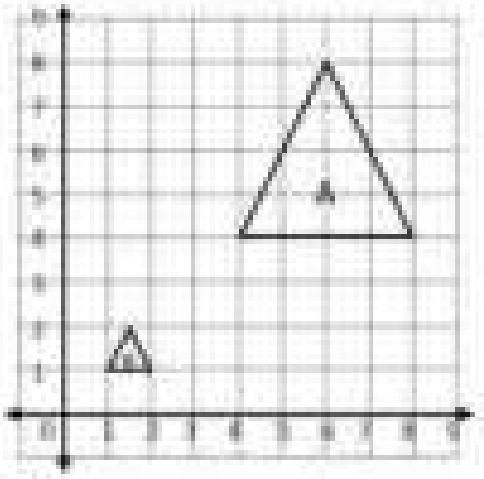
5) _____ k = ____



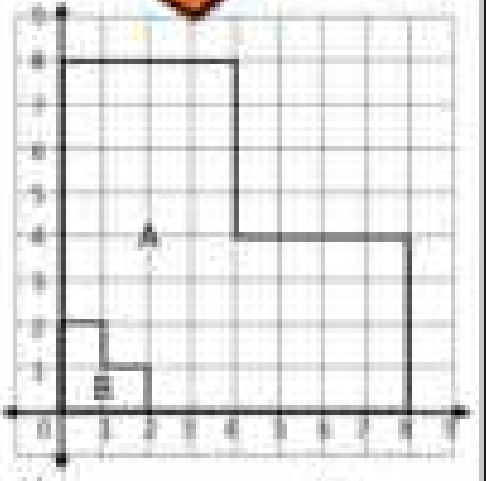
6) _____ k = ____



7) _____ k = ____



8) _____ k = ____



9) _____ k = ____

Name: _____ 72

Dilations – Finding New Coordinates

The mapping rules for dilations help us determine where the new coordinates will be after we have transformed the original points by a scale factor.

Mapping Rule: $(x, y) \rightarrow (kx, ky)$ where k = scale factor

For example, $(x, y) \rightarrow (2x, 2y)$; each of the image points are double the original points because the scale factor is 2. Therefore, the image point for (−3, 4) would be (−6, 8).

Part 1

Find the dilated coordinates of the triangles below

	Coordinate A	Coordinate B	Coordinate C
Original Coordinates	(3, 4)	(−3, 5)	(0, 0)
Dilated Coordinates			

2) k = 1/4	Coordinate A	Coordinate B	Coordinate C
Original Coordinates	(−8, −4)	(4, 12)	(−2, 4)
Dilated Coordinates			

3) k = 1.5	Coordinate A	Coordinate B	Coordinate C
Original Coordinates	(2, −4)	(6, −2)	(8, −10)
Dilated Coordinates			

Part 2

Find the dilated coordinates of the quadrilaterals

1) k = 3	Coordinate A	Coordinate B	Coordinate C	Coordinate D
Original Coordinates	(−2, 5)	(−1, 4)	(4, 5)	(−3, 7)
Dilated Coordinates				

2) k = 2	Coordinate A	Coordinate B	Coordinate C	Coordinate D
Original Coordinates	(1, 5)	(−4, 3)	(2, −6)	(5, −8)
Dilated Coordinates				

3) k = 1/2	Coordinate A	Coordinate B	Coordinate C	Coordinate D
Original Coordinates	(−4, 6)	(−10, 6)	(5, −8)	(12, −9)
Dilated Coordinates				

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Questions: Answer the questions below

State the new coordinates of a point after a dilation with the given scale factor. Use the point (x, y) = (3, 2) as the original.

A) Scale Factor k = 3 _____

B) Scale Factor k = 0.5 _____

C) Scale Factor k = 3/4 _____

D) Scale Factor k = 0.25 _____

E) Scale Factor k = 4/2 _____

Name: _____

Questions: Answer the questions below

State the new coordinates of a point after a dilation with the given scale factor. Use the point (x, y) = (3, 2) as the original.

A) Scale Factor k = 3 _____

B) Scale Factor k = 0.5 _____

C) Scale Factor k = 3/4 _____

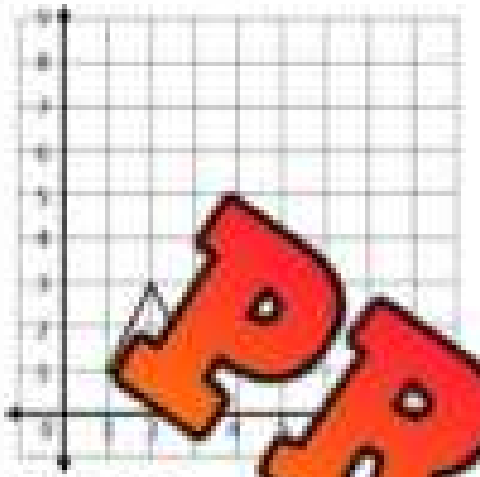
D) Scale Factor k = 0.25 _____

E) Scale Factor k = 4/2 _____

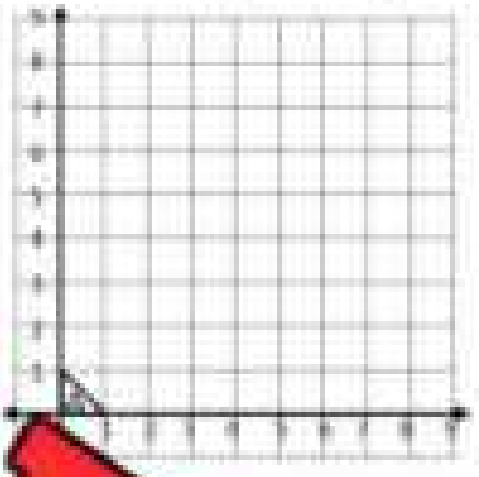
Name: _____ 74

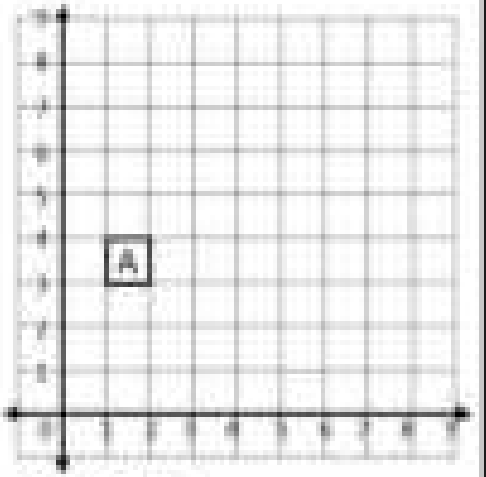
Performing Dilations

Instructions Draw the dilated shape on the grid

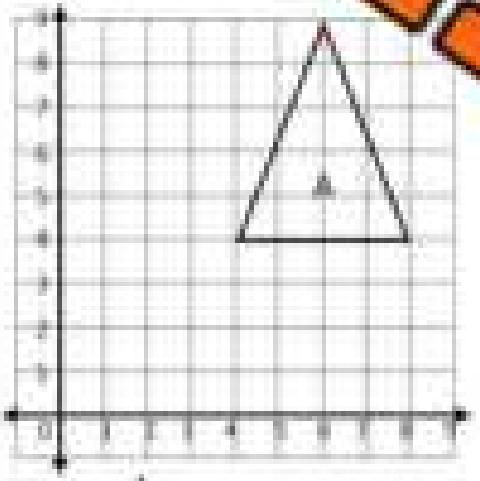


1) k = 3

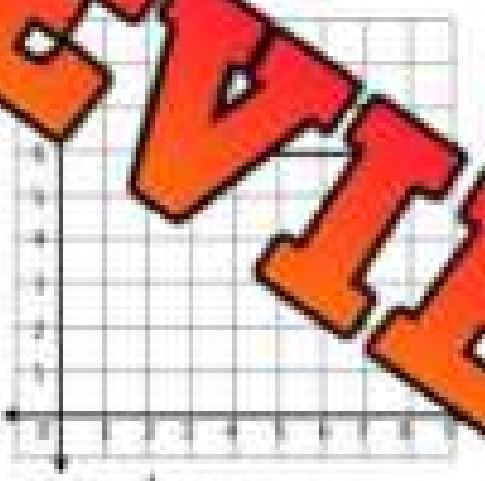




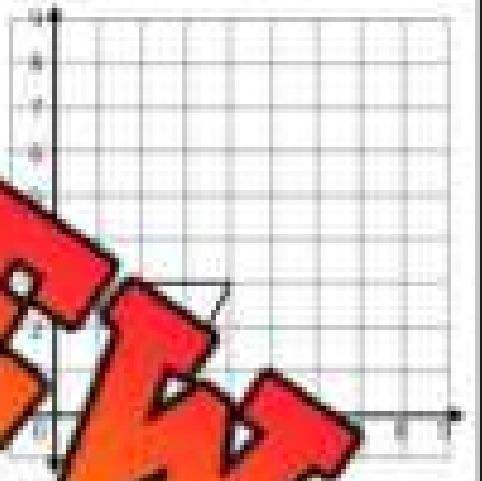
3) k = 2



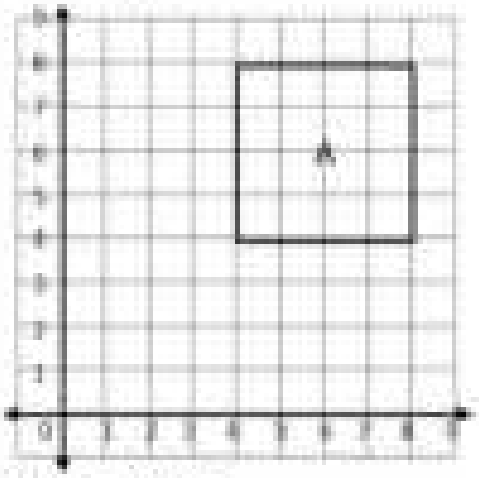
4) k = $\frac{1}{2}$



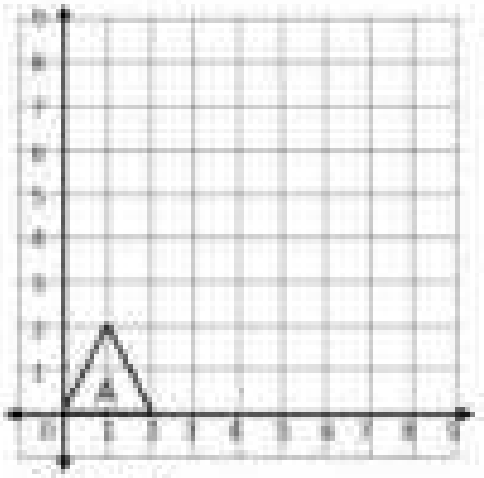
5) k = $\frac{1}{3}$



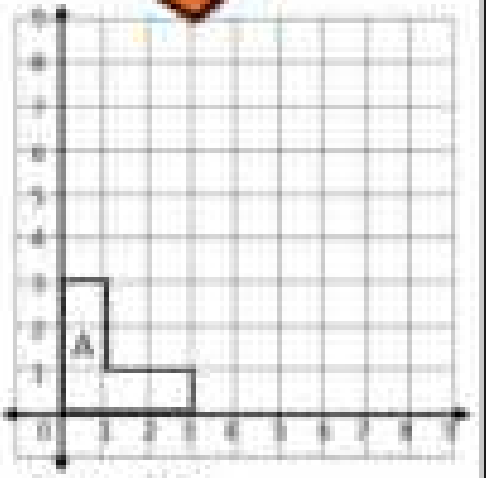
6)



7) k = 0.25



8) k = 4



9) k = 2.5

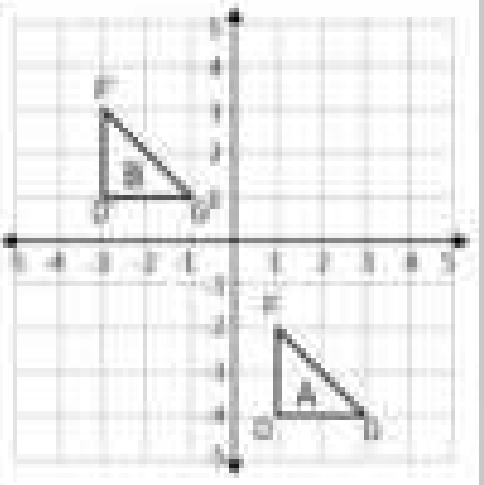
Name: _____ 77

Translations – Mapping Rules

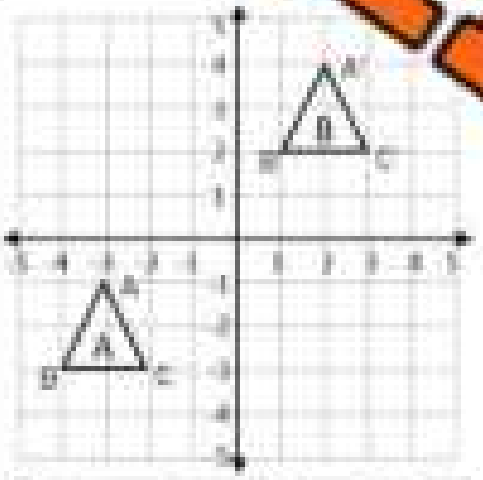
Mapping Rules for Translations

Each point on a shape slides according to the mapping rule.
The rule is (x, y) → (x + a, y + b)

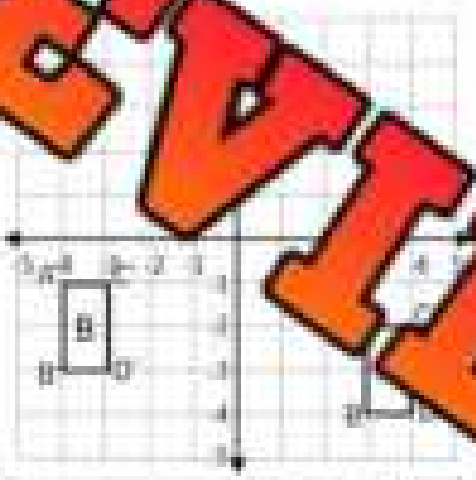
1) Choose 1 coordinate from the shape to translate
2) We need to move the x coordinate -4 spaces to the left. This means we subtract 4.
3) We need to move the y coordinate +5 spaces up. This means we add 5.
4) The mapping rule is: (x, y) → (x – 4, y + 5)
5) Remember, if we move to the left or down, we are subtracting and if we move up, we are adding a positive number.



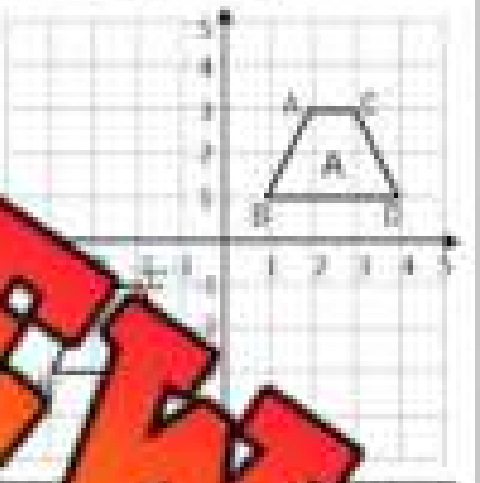
Instructions Write the mapping rule that translates figure A to figure B



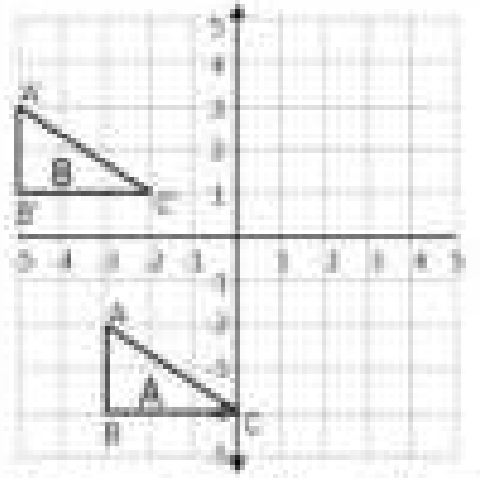
Mapping Rule	(x☐__, y☐__)



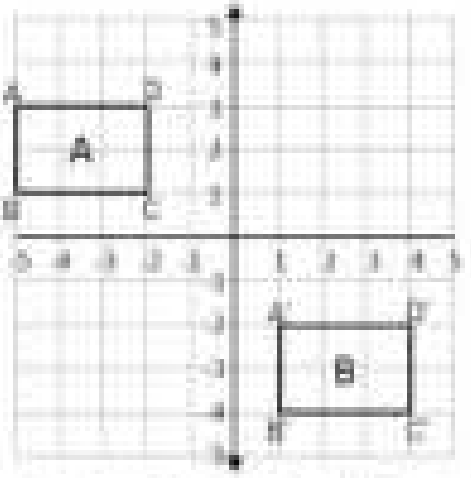
Mapping Rule	(x☐__, y☐__)



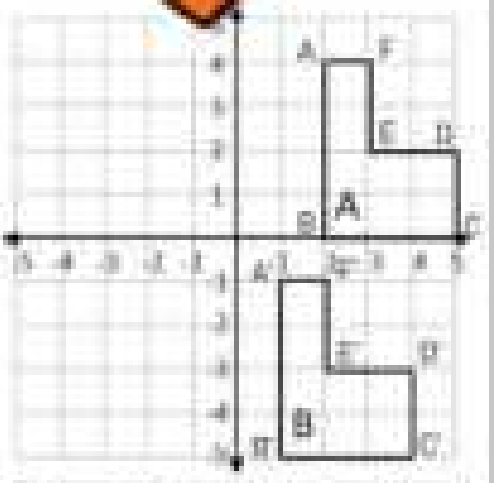
Mapping Rule	(x☐__, y☐__)



Mapping Rule	(x☐__, y☐__)



Mapping Rule	(x☐__, y☐__)



Mapping Rule	(x☐__, y☐__)

Name: _____ 8D

Math Activity: Translation Relay Race

Objective

What are we learning about?

To help students understand and describe translations using mapping rules on a Cartesian plane through a fun and engaging relay race activity.

Materials

What you will need for the activity.

- Gra
- P
- ers
- Pen and
- Translatio

Instructions

How to complete the activity

1. Explain Translations: Start by explaining that translations on the Cartesian plane involve moving shapes without rotating, flipping, or resizing them. Introduce the concept of mapping rules (e.g., (x, y) → (x+3, y-2)).
2. Distribute Materials: Provide each team with graph paper and a set of translation task cards with mapping rules.
3. Form Teams: Divide the class into small teams, each standing at the starting point with their graph paper and task cards.
4. Translation Task: The first student in each team picks a translation task card and then plots the point on the grid at the given coordinates – e.g., (2, 3).
5. Perform Translation: The student then applies the mapping rule from the task card to the point's coordinates and draws the new position on the grid.
6. Pass to Next Student: The student then goes to the end of the line, and the next student steps up.
7. Repeat Process: The next student repeats the process.
8. Continue Relay: Continue the relay until all team members have had a turn or all task cards are used.
9. Verification and Discussion: The teacher verifies the translations, and the class discusses the different translations and observations.

Name: _____ 82

Task Cards | Cut out the task cards below

Card 11:

Start: (0, -4)
Mapping Rule: (x, y) → (x+5, y+2)

Card 16:

Start: (4, 4)
Mapping Rule: (x, y) → (x+3, y+1)

Card 17:

Start: (0, -3)
Mapping Rule: (x, y) → (x+5, y+4)

Card 13:

Start: (-5, 1)
Mapping Rule: (x, y) → (x+2, y+5)

Card 18:

(2, 2)
→ (x-8, y-8)

Card 14:

Start: (-2, -5)
Mapping Rule: (x, y) → (x+7, y+4)

Card 19:

Start: (5, 1)
Mapping Rule: (x, y) → (x+3, y+3)

Card 15:

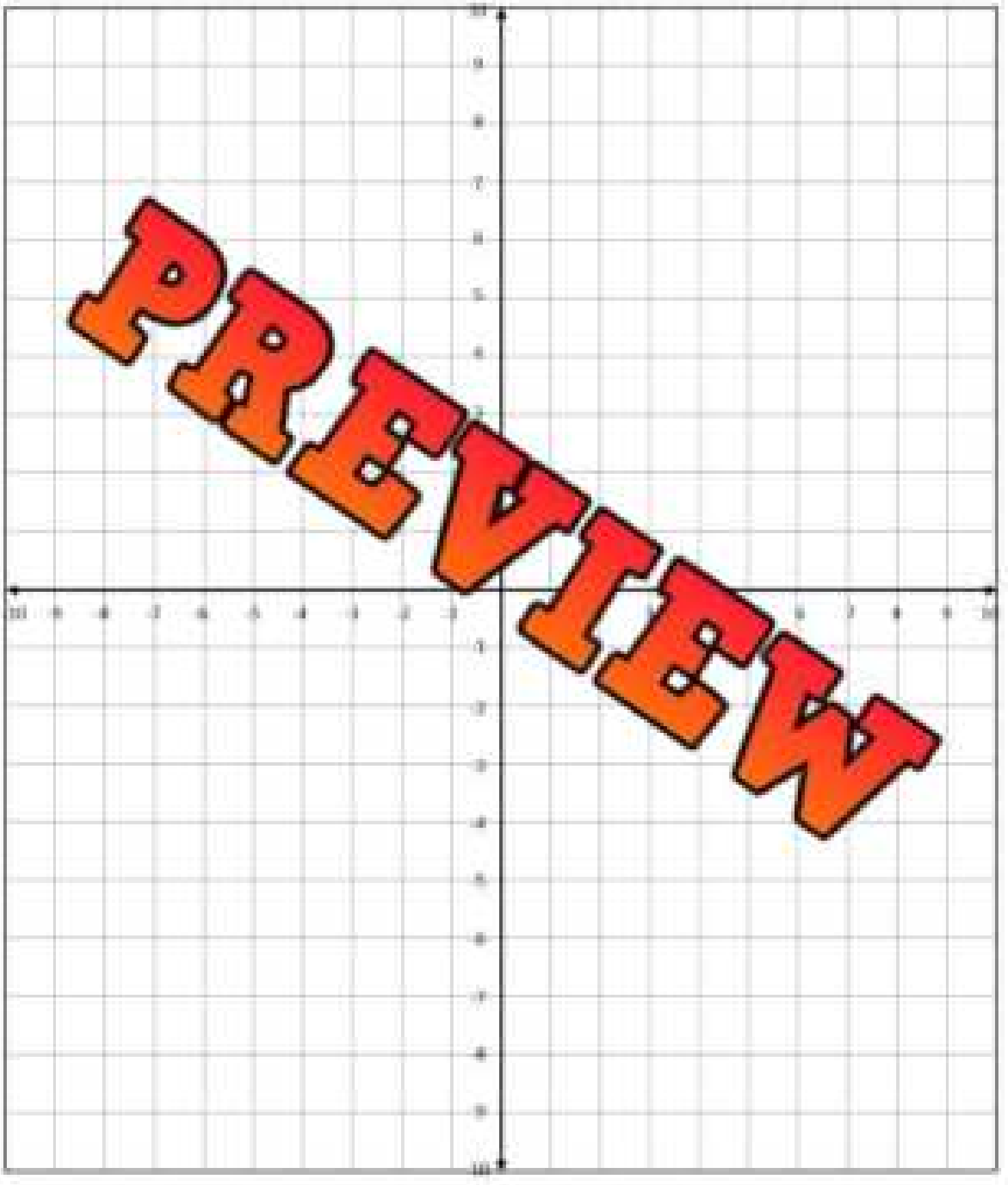
Start: (-4, 1)
Mapping Rule: (x, y) → (x+6, y+4)

Card 20:

Start: (-3, 0)
Mapping Rule: (x, y) → (x+4, y+4)

Name: _____ 83

Grid Paper | Use the cartesian plane to perform the translations

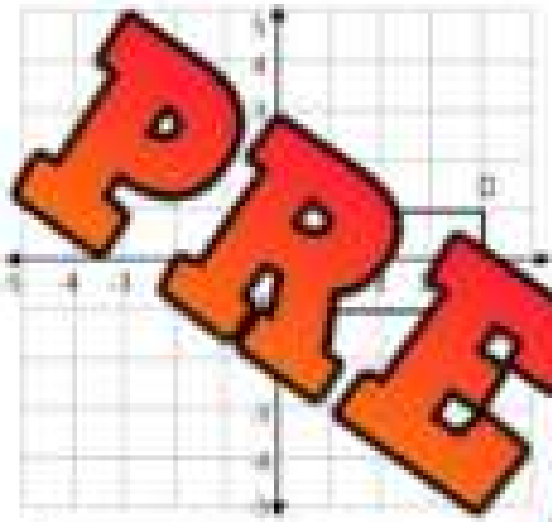


Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: ____________________

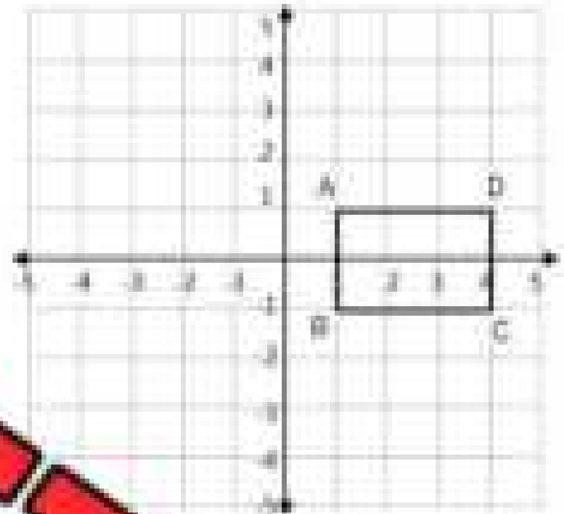
Translate the shape using the mapping rule.



Mapping Rule	(x + 4, y − 3)

Name: ____________________

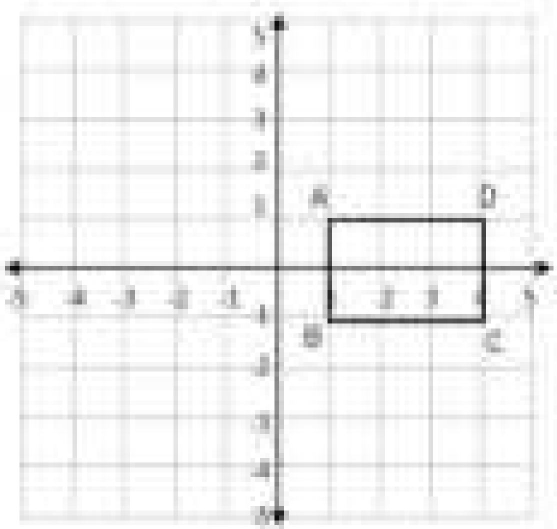
Translate the shape using the mapping rule.



Mapping Rule	(x + 4, y − 3)

Name: ____________________

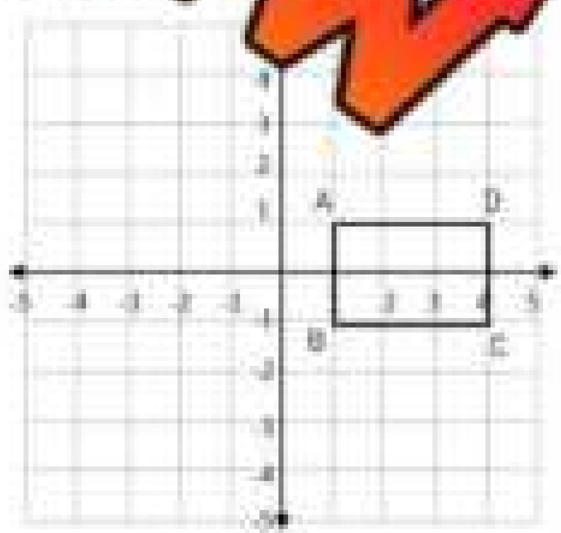
Translate the shape using the mapping rule.



Mapping Rule	(x + 4, y − 3)

Name: ____________________

Translate the shape using the mapping rule.

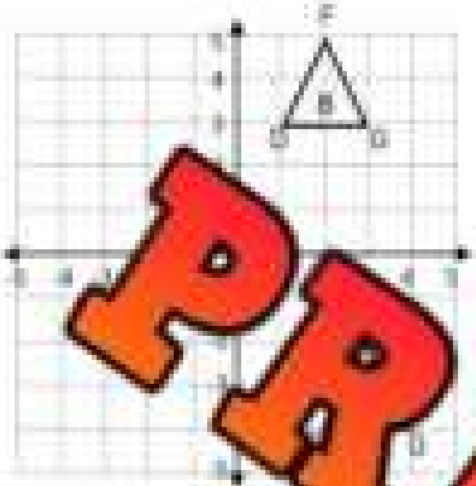


Mapping Rule	(x + 4, y − 3)

Curriculum Connection

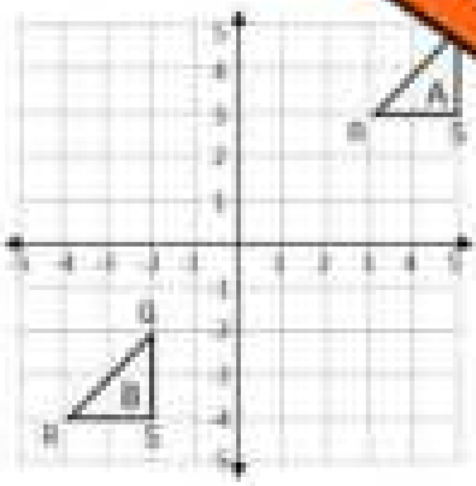
Transformations - Translations

Instructions 1) Fill in the coordinates 2) Describe the translation 3) Translate shape C



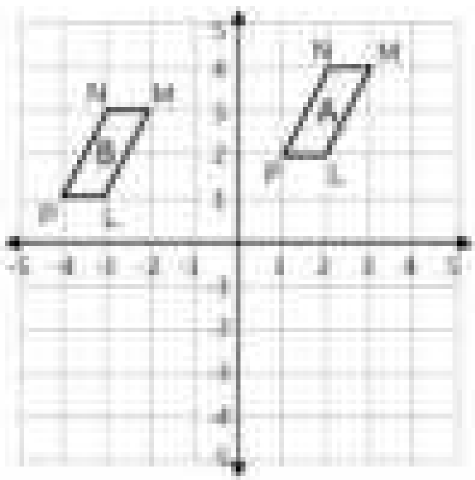
Coordinates A	Coordinates B
D(__, __) F(__, __) G(__, __)	D(__, __) F(__, __) G(__, __)
Mapping Rule (x, y) → (x, y) → (x + a, y + b)	

Translate Shape B to Shape C (x − 4, y − 5)	Coordinates C



Coordinates A	Coordinates B
Mapping Rule (x, y) → (x, y) → (x + a, y + b)	

Translate Shape B to Shape C (x, y + 6)	Coordinates C



Coordinates A	Coordinates B
Mapping Rule (x, y) → (x, y) → (x + a, y + b)	

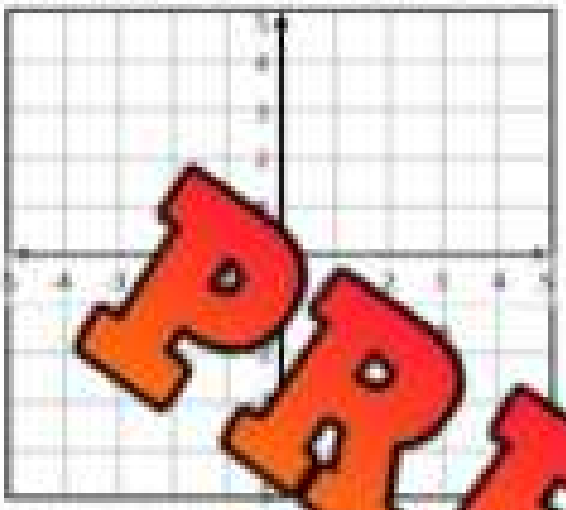
Translate Shape B to Shape C (x + 4, y − 5)	Coordinates C

Name: _____ 87

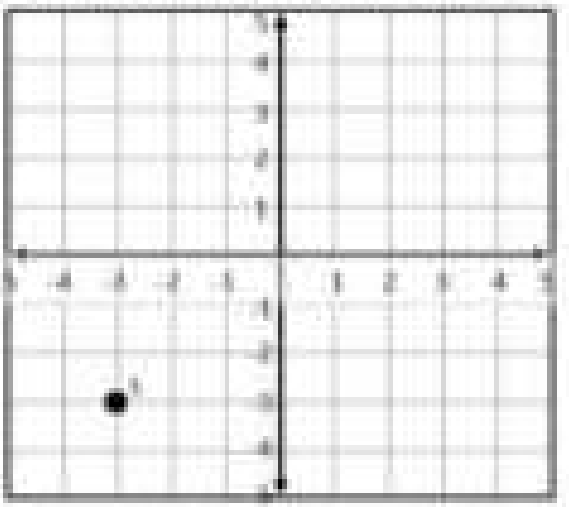
Reflecting a Point Using a Mirror Line

Instructions Graph the new position of each point

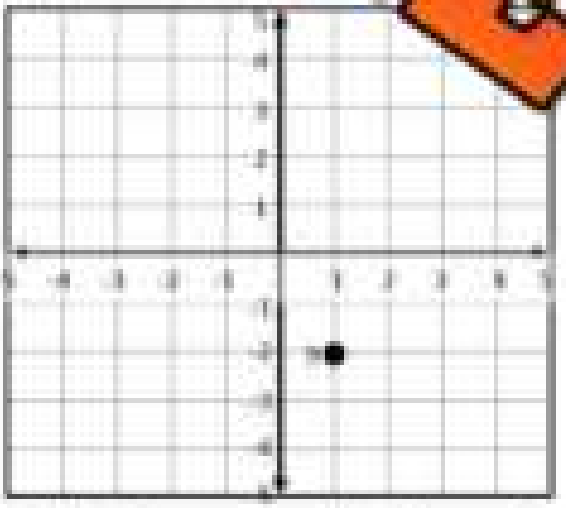
1) Reflection across the line x = 1



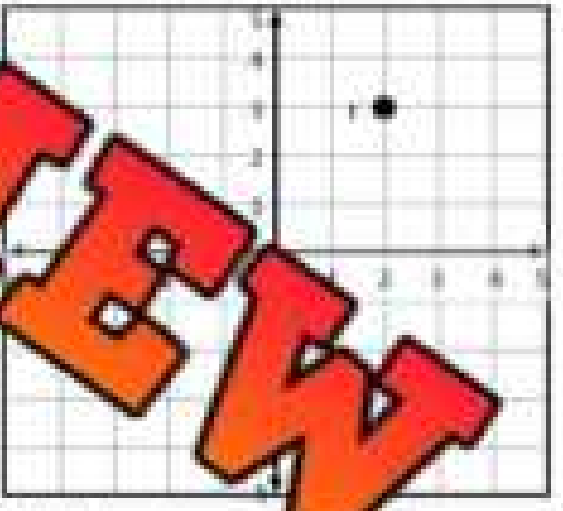
2) Reflection across the line y = -1



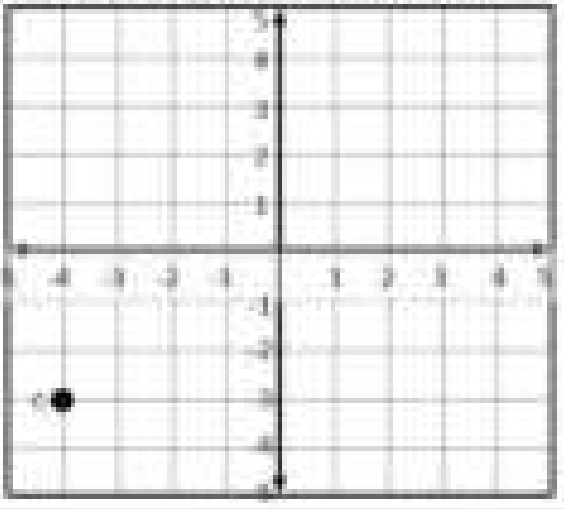
3) Reflection across the line y = -2



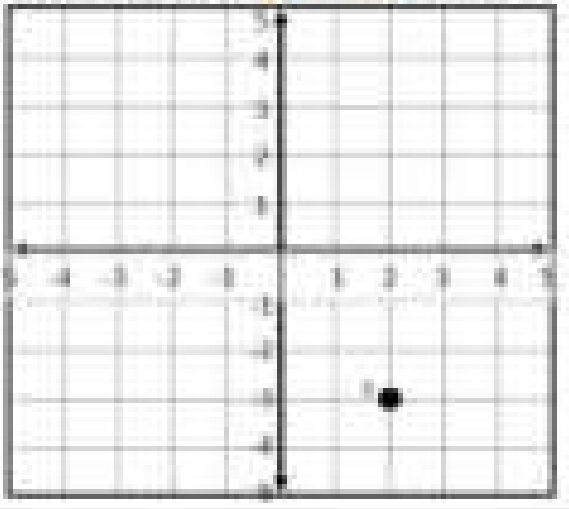
4) Reflection across the line x = -1



5) Reflection across the line y = -1



6) Reflection across the line y = -2

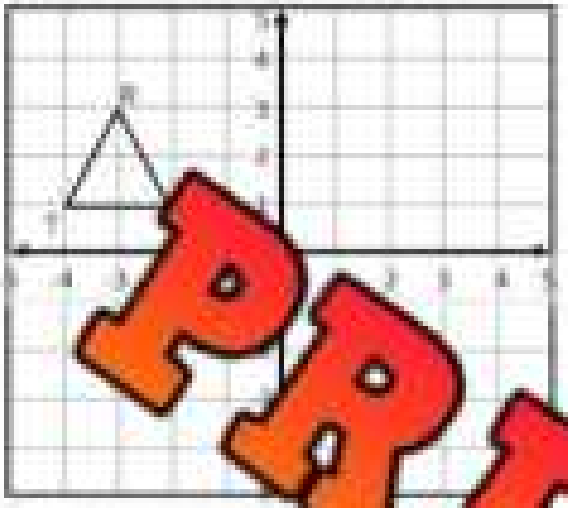


Name: _____ 89

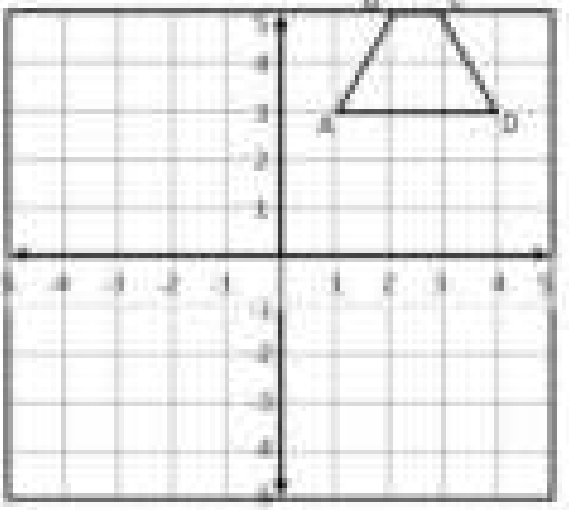
Reflecting a Shape Using a Mirror Line

Instructions Graph the new position of each shape after the given reflection

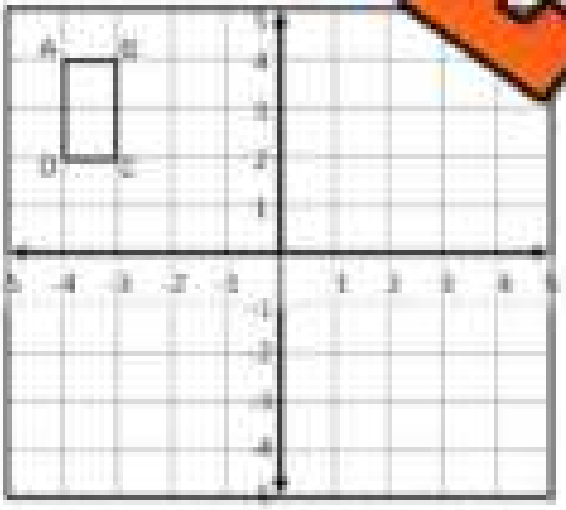
1) Reflection across the y-axis



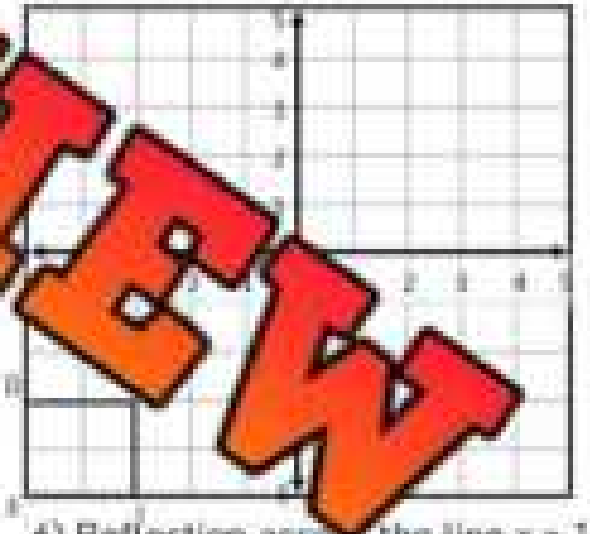
2) Reflection across the x-axis



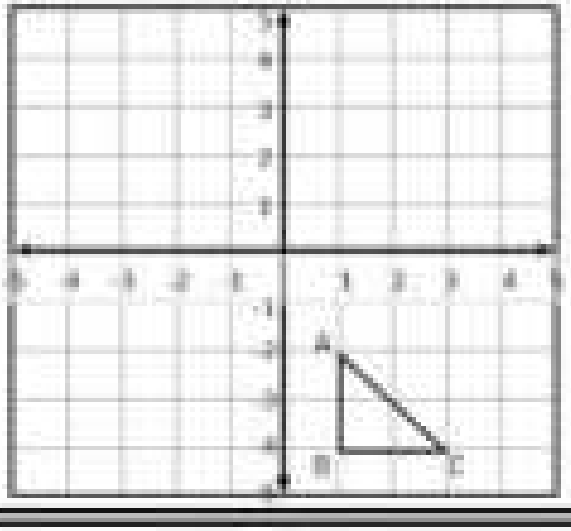
3) Reflection across the



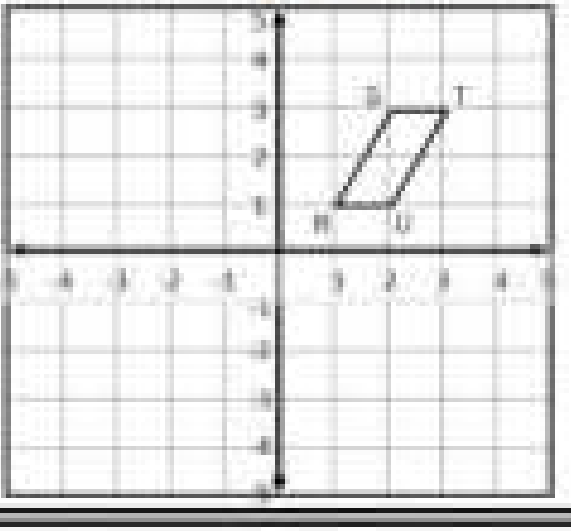
4) Reflection across the line x = -1



5) Reflection across the line y = -1



6) Reflection across the line x = 1

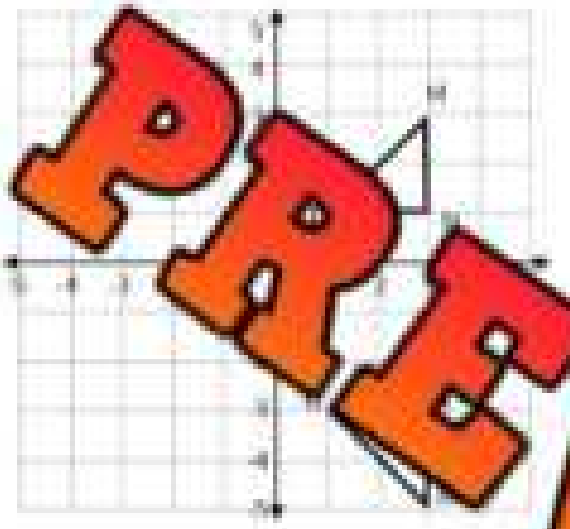


Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

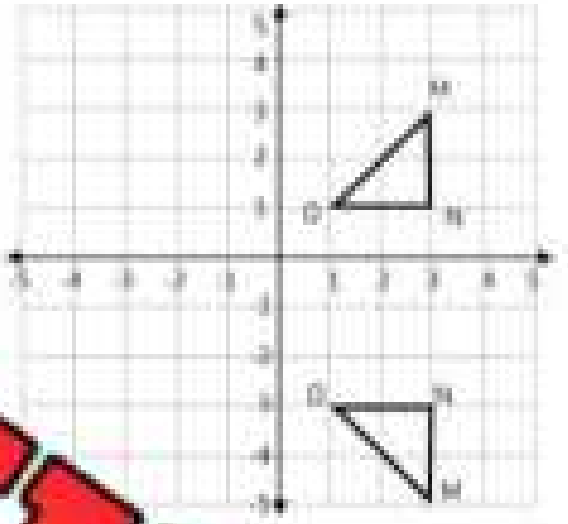
Describe the rule for the reflection line



Answer: _____

Name: _____

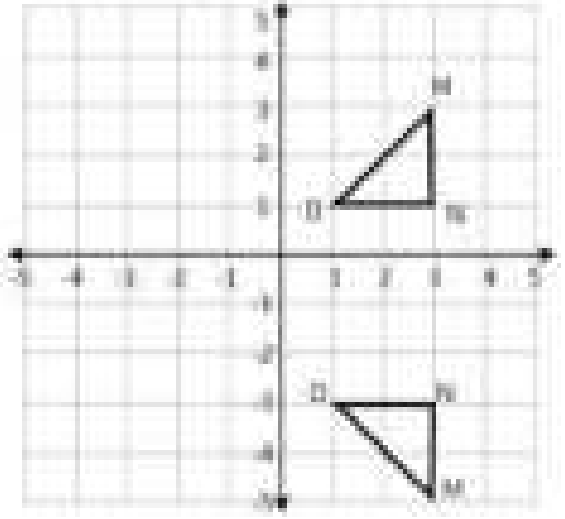
Describe the rule for the reflection line



Answer: _____

Name: _____

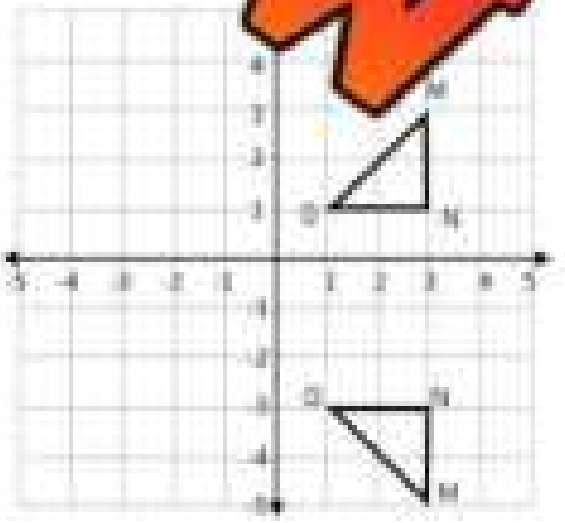
Describe the rule for the reflection line



Answer: _____

Name: _____

Describe the rule for the reflection line



Answer: _____

Name: _____ 92

Reflections – Mapping Rules

Mapping Rules for Reflections

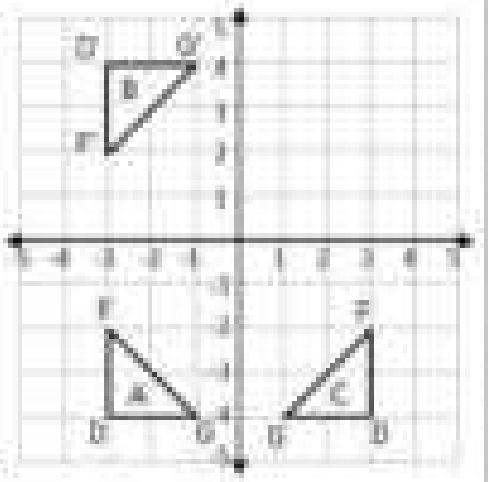
Each point on a shape moves according to the mapping rule.

The rule for a reflected shape in the x-axis is $(x, y) \rightarrow (x, -y)$

The rule for a reflected shape in the y-axis is $(x, y) \rightarrow (-x, y)$

In the example of Shape A being reflected to Shape B, point F (-3, -2) has been reflected across the x-axis, which means the new coordinates for F are (-3, 2).

If Shape [illegible] reflected across the Y axis to Shape C, point F becomes [illegible]



Instructions [illegible] rules to write the new coordinates

	Original Coo[illegible]	[illegible] across the	New Coordinates
1)	P(5, 4)		P(-5, 4)
2)	S(8, -3)	x-axis	
3)	Q(-6, 7)	y-[illegible]	
4)	P(-4, -2)	y-axis	
5)	T(-5, 9) Y(-11, -15)	x-axis	
6)	S(-12, -3) R(7, 13)	x-axis	
7)	N(-4, 9) K(8, -17)	y-axis	
8)	P(13, -5) E(-6, 15)	x-axis	
9)	S(-18, -13) R(9, 14)	y-axis	
10)	N(-6, 11) K(7, -23)	x-axis	

Name: _____ #3

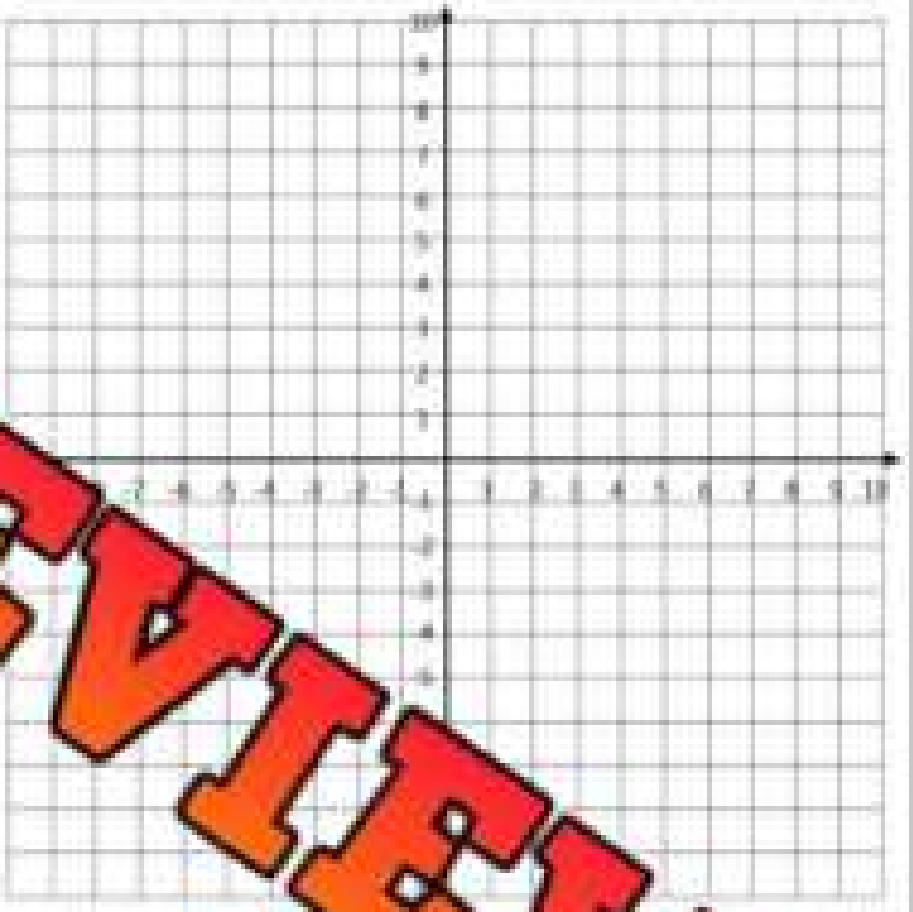
Reflections – Coordinates

Part 1 Draw the shapes using the coordinates provided. Then reflect the shapes.

Shape A
P(5,4), Q(3,7), R(3,3)
Reflect over the x-axis
New Coordinates
P(,), Q(,), R(,)

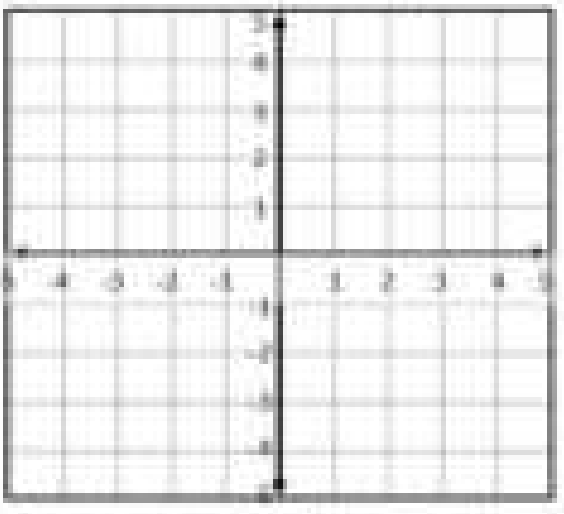
Shape B
P(,), Q(,), R(,)
Reflect over the x-axis
New Coordinates
P(,), Q(,), R(,)

Shape C
J(-7,-4), K(-4,-9), L(-3,-3)
Reflect over the y-axis
New Coordinates
J(,), K(,), L(,)

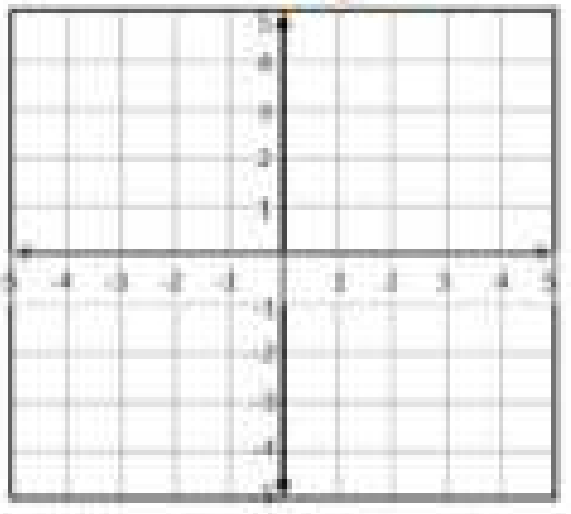


Part 2 Draw your own shape and then perform the reflect

1) Reflection across the y-axis



2) Reflection acro the line x = -1

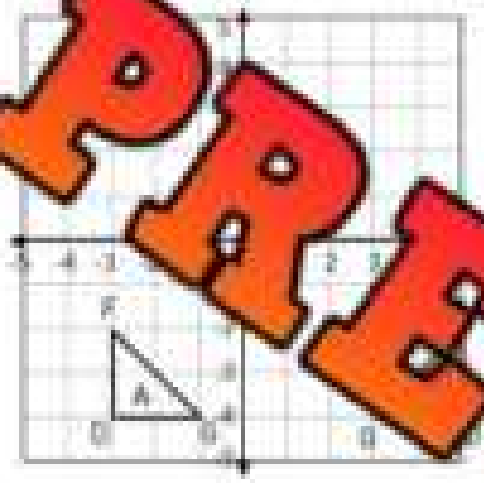


Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

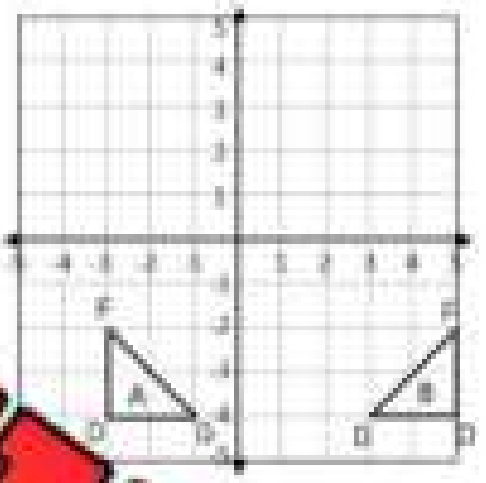
Name: _____

Describe the rule for the reflection line



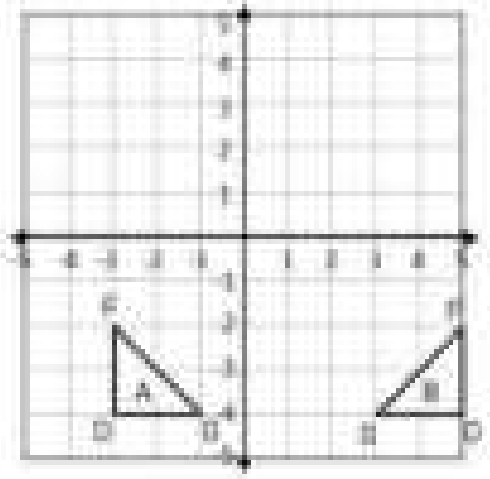
Name: _____

Describe the rule for the reflection line



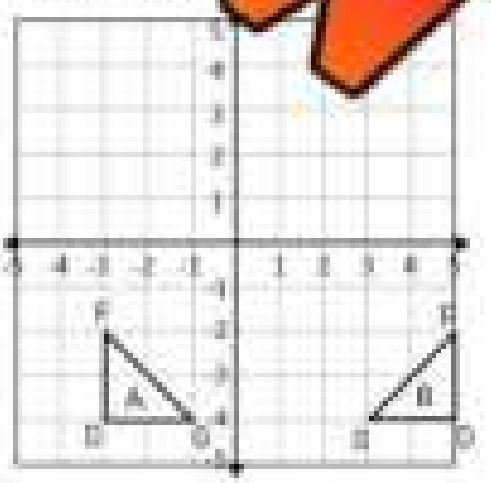
Name: _____

Describe the rule for the reflection line



Name: _____

Describe the rule for the reflection line



Name: _____ 97

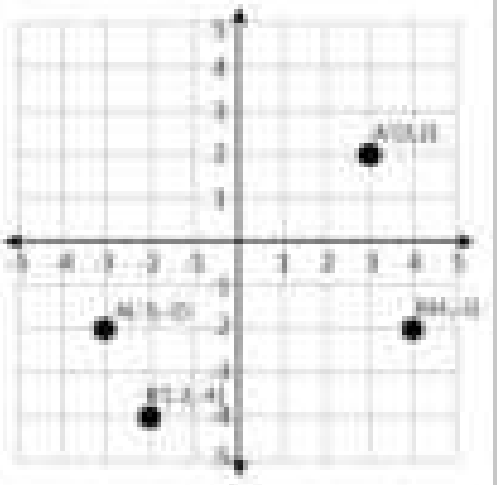
Rotating a Point

Mapping Rules for Rotations

Each point on a shape moves according to the mapping rule.

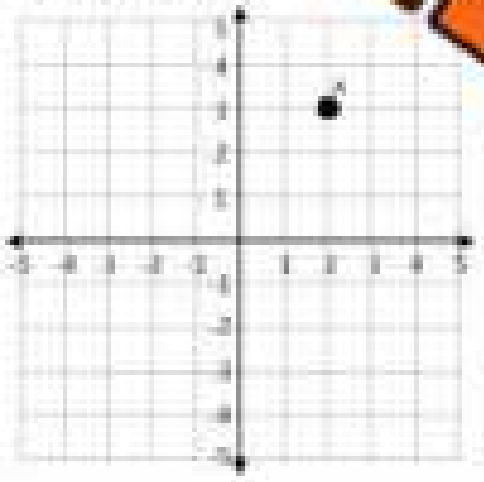
- a shape rotated 90° counterclockwise has a mapping rule of: $(x, y) \rightarrow (-y, x)$.
- a shape rotated 180° counterclockwise has a mapping rule of: $(x, y) \rightarrow (-x, -y)$.
- a shape rotated 270° counterclockwise has a mapping rule of: $(x, y) \rightarrow (y, -x)$.

In the ex... was rotated 180° counter-clockwise.
In the ... rotated 90° clockwise.



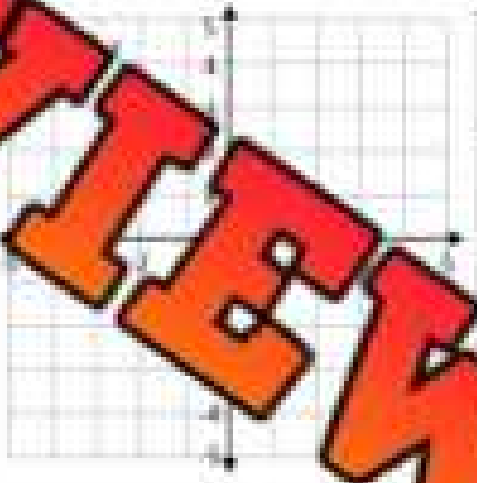
Instructions ... rotation after rotating around the origin

1) 180° rotation



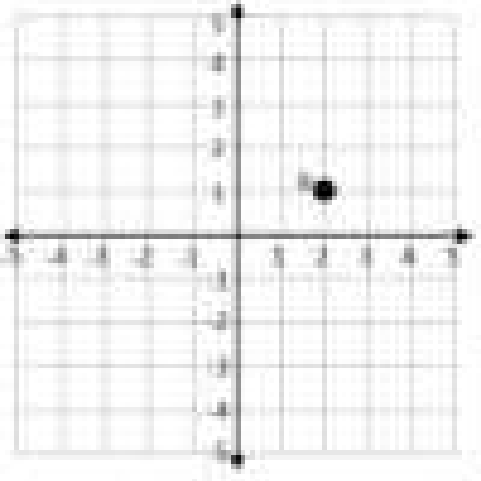
Original Coordinates
A(,)
Rotated Coordinates
A(,)

2) 90° clockwise rotation



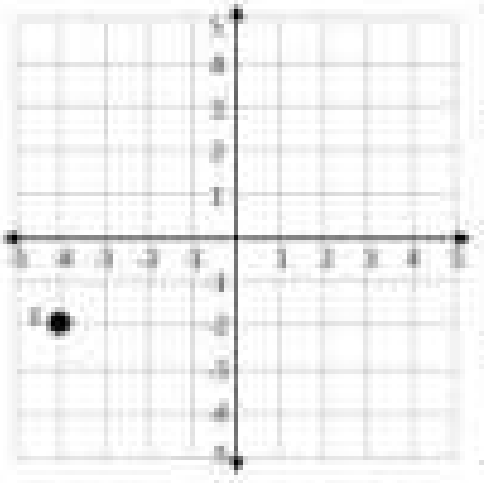
Original Coordinates
E(,)
Rotated Coordinates
(,)

3) 90° counterclockwise rotation



Original Coordinates
B(,)
Rotated Coordinates
B(,)

4) 90° clockwise rotation



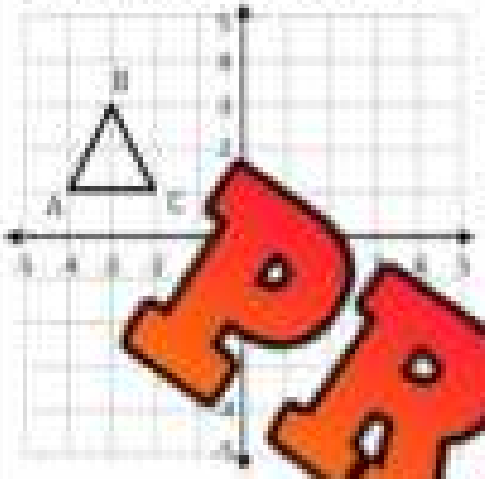
Original Coordinates
E(,)
Rotated Coordinates
E(,)

Name: _____ 99

Rotating Shapes

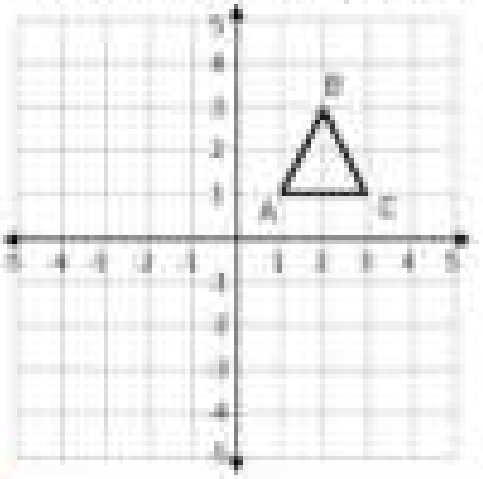
Instructions Graph the new position of each shape after the given rotation

1) 90° clockwise rotation



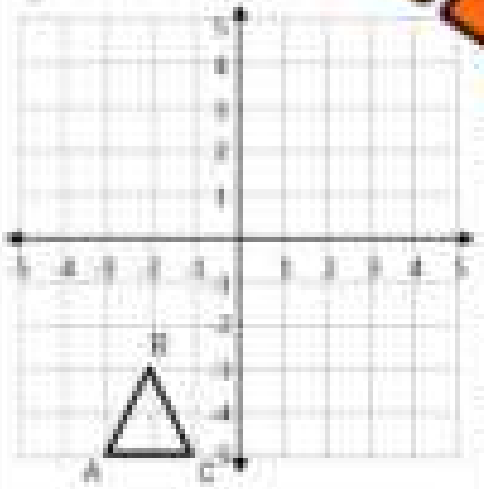
Original Coordinates
A(,)
B(,)
C(,)
Rotated Coordinates
A(,)
B(,)
C(,)

2) 90° counterclockwise rotation



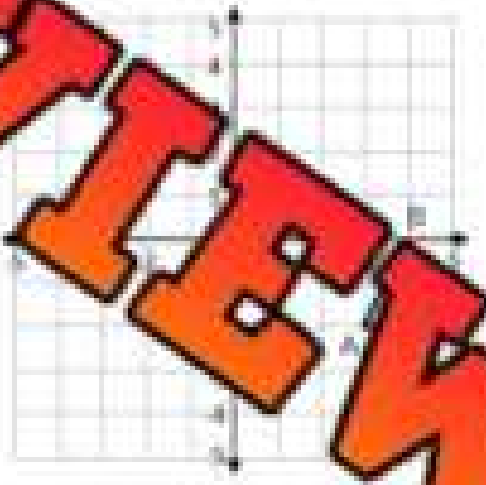
Original Coordinates
A(,)
B(,)
C(,)
Rotated Coordinates
A(,)
B(,)
C(,)

3) 180° rotation



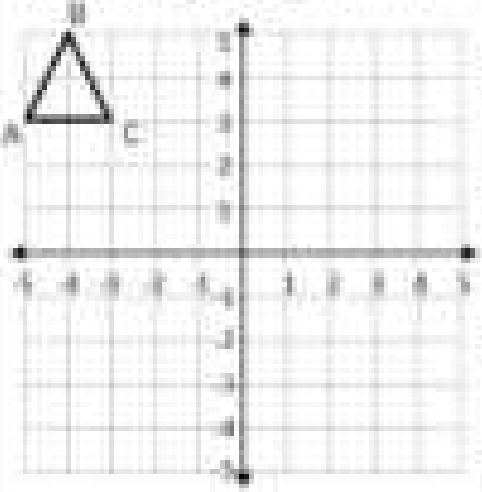
Original Coordinates
A(,)
B(,)
C(,)
Rotated Coordinates
A(,)
B(,)
C(,)

270° clockwise rotation



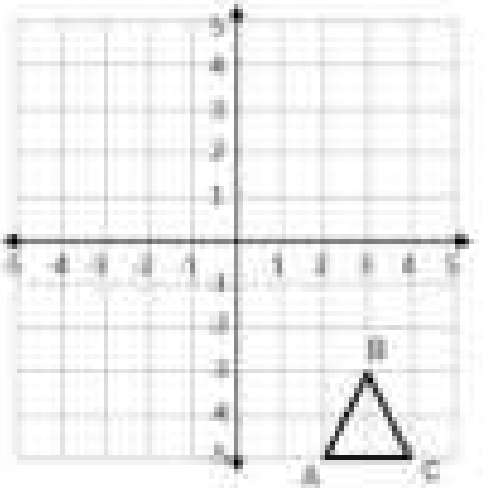
Original Coordinates
A(,)
B(,)
C(,)
Rotated Coordinates
(,)
(,)
(,)

5) 90° clockwise rotation



Original Coordinates
A(,)
B(,)
C(,)
Rotated Coordinates
A(,)
B(,)
C(,)

6) 90° counterclockwise rotation



Original Coordinates
A(,)
B(,)
C(,)
Rotated Coordinates
A(,)
B(,)
C(,)

Name: _____ 101

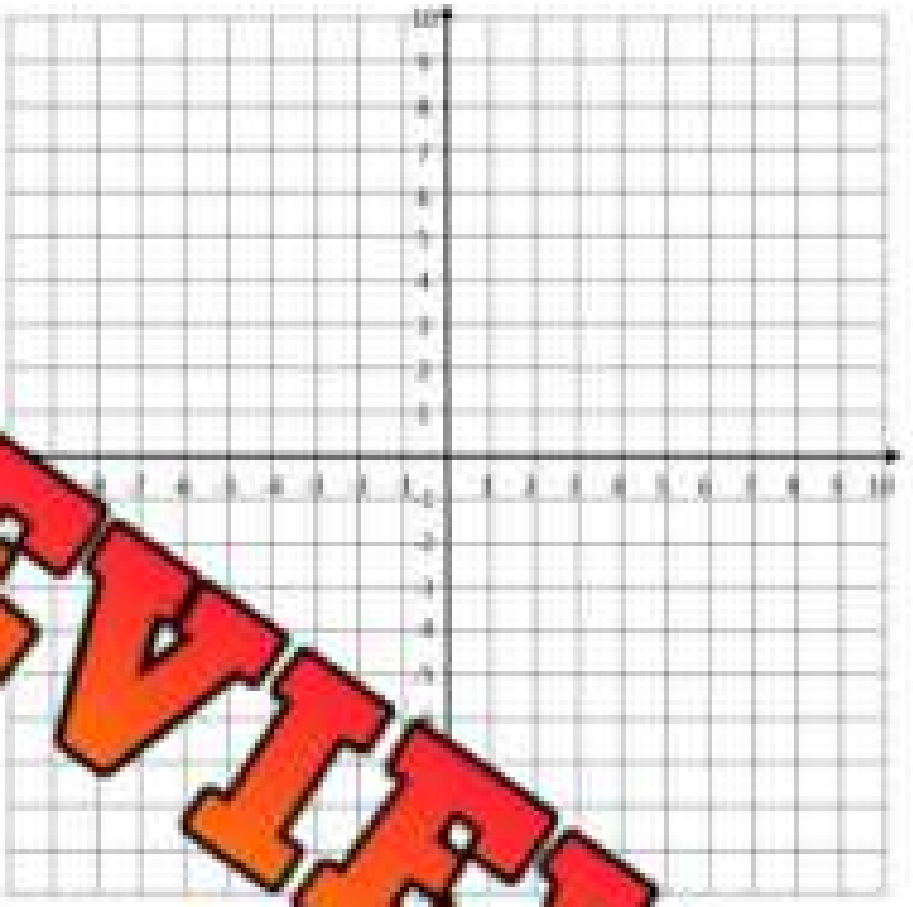
Rotations – Coordinates

Part 1 Draw the shapes using the coordinates provided. Then rotate the shape about the origin.

Shape A
P(8,4), Q(5,7), R(4,3)
90° counterclockwise rotation
New Coordinates
P(,), Q(,), R(,)

180°
New Coo
F(,), G(,), H

Shape C
J(-1,-8), K(-4,-6), L(-1,-3)
270° counterclockwise rotation
New Coordinates
J(,), K(,), L(,)



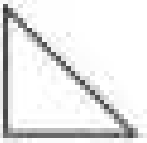
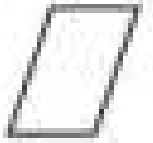
Part 2 Provide the coordinates of each point after the ro

	Original Coordinate	Rotations Across The Line...	New Coordinates
1)	P(5, 4)	90° counterclockwise rotation	P(-4, 5)
2)	S(3, -6)	180° rotation	
3)	Q(-4, 9)	360° rotation	
4)	P(-7, -11)	270° counterclockwise rotation	
5)	T(-5, 1) Y(-4, -7)	90° clockwise rotation	
6)	S(-7, -5) R(8, 2)	180° rotation	
7)	N(-5, 8) K(4, -9)	270° clockwise rotation	
8)	P(3, -5) E(-6, 2)	180° rotation	

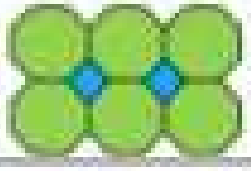
Name: _____ 113

Geometry Test

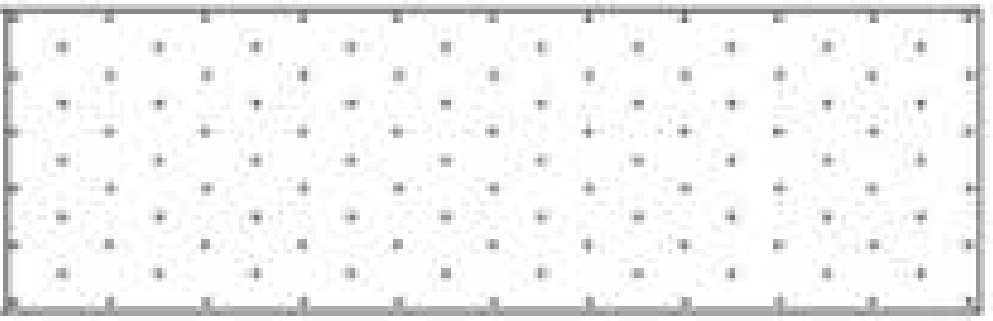
Part 1 Can the shapes below be used by themselves in a tessellation?

		
1) Yes No	2) Yes No	3) Yes No
		
4) Yes	5) Yes No	6) Yes No

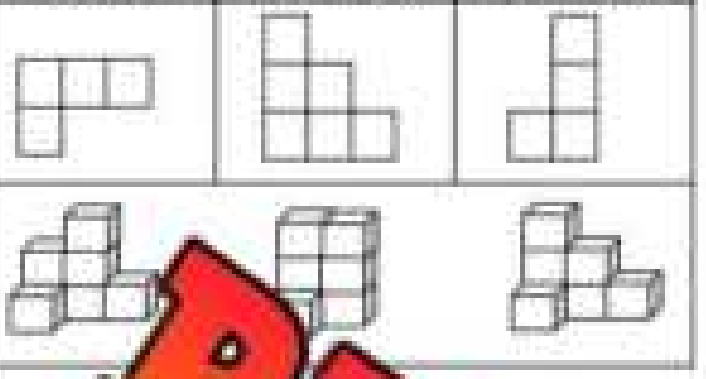
Part 2 Wri[illegible] of t[illegible] the examples below

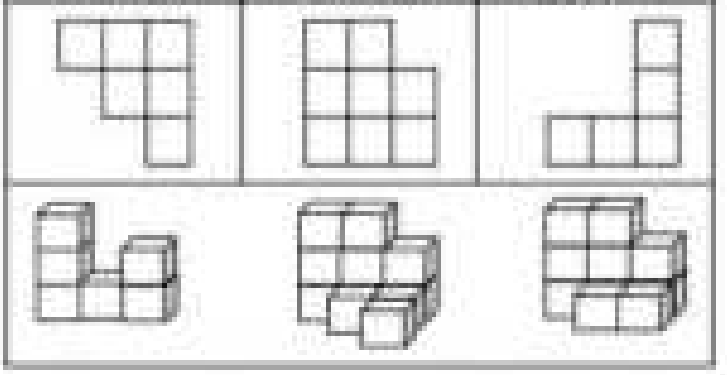
	Tessellation	Type of Tessellation [illegible]ar, Semi-Regular, Irregular
1)		
2)		
3)		

Part 3 Draw a tessellation using the combination of polygons below

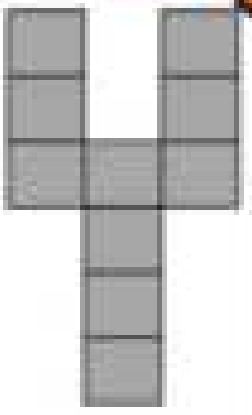
Pentagon and Triangle	

Part 4 Look at the front, top, and side views and circle the matching 3D object

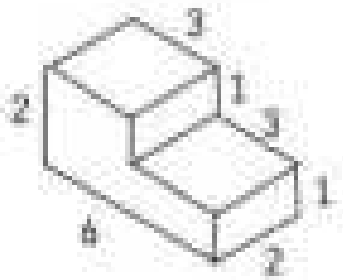
Top View	Front View	Side View
		

Top View	Front View	Side View
		

Part 5 Draw ... ic view of the letter. Use a scale of 1:1.

Letter	Fron...	Isometric View
Y		

Part 6 Draw the top, front, and side views of the isometric drawing

Isometric View	Cavalier	Cabinet
2) 		

Part 7 Fit your drawing on the grid by choosing an appropriate scale

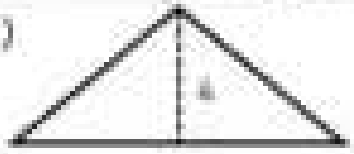
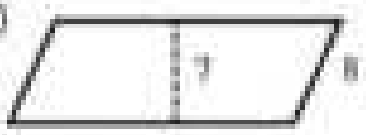
1) A garage door has the dimensions 225cm by 175cm. Draw the garage door by determining the scale.

Scale = 1cm to _____

2) A stre[illegible] has the following dimensions: 88cm by 66cm. Dr[illegible]gn by determining the scale.

Scale = 1cm [illegible]

Part 8 Calculate [illegible] the [illegible] shape and the scaled drawing

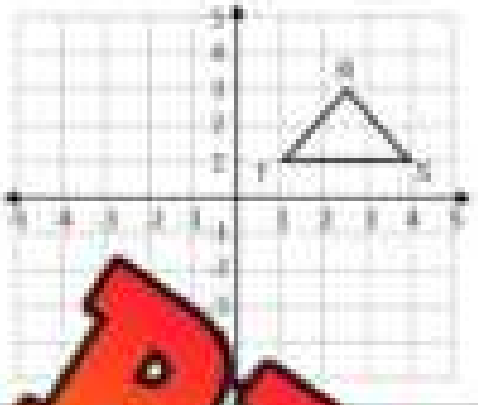
Original Shape	Scaled Drawing
1)  Area = _____	Scale [illegible] 2 [illegible]ea = _____
2)  Area = _____	Scale Factor = 4 [illegible] = _____

Part 9 Give the coordinates of each point after the translation

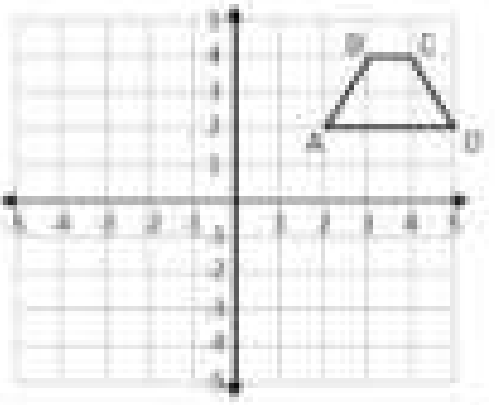
	Original Coordinate	Translation – Mapping Rule	New Coordinates
1)	P(3, -4)	(x – 6, y + 4)	P(-3, 0)
2)	S(-5, 8)	(x + 3, y – 5)	
3)	Q(-9, -5)	(x + 2, y – 7)	
4)	L(10, 5) P(-3, -8)	(x – 5, y + 8)	
5)	T(-8, 7) Y(-9, -5)	(x + 8, y + 5)	

Part 10 — Graph the new position of each shape after the given reflection

1) Reflection across the line y = -1

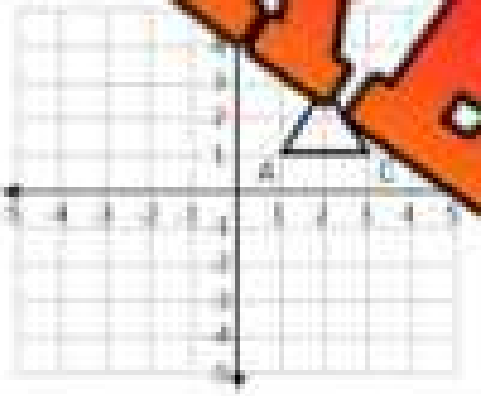


2) Reflection across the line x = 1



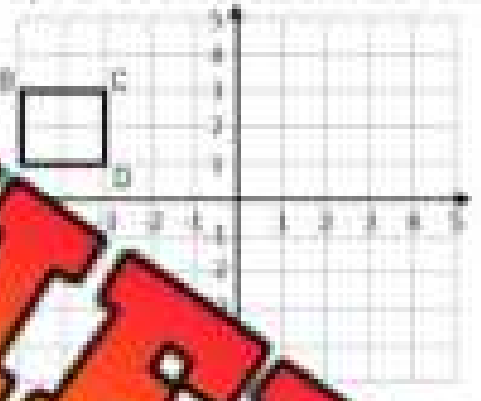
Part 11 — Graph the new position of each shape after the given rotation

1) 270° counterclockwise rotation



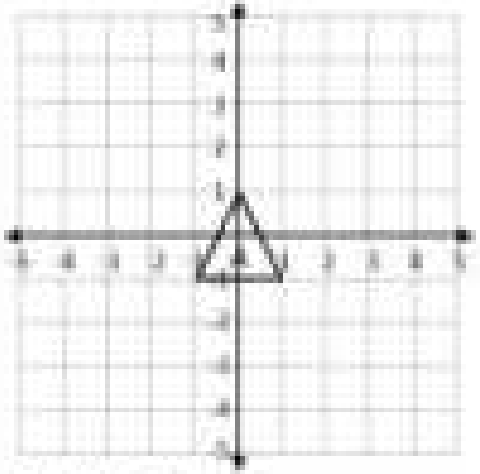
Original	A(,)	B(,)	C(,)
Rotated	A(,)	B(,)	C(,)

2) 90° counterclockwise rotation

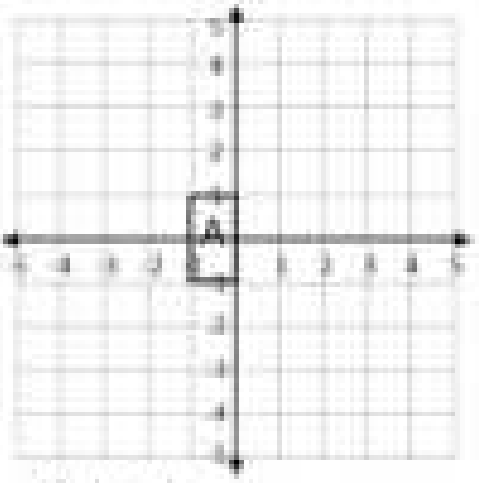


Original				D(,)
Rotated	A(,)	B(,)		,)

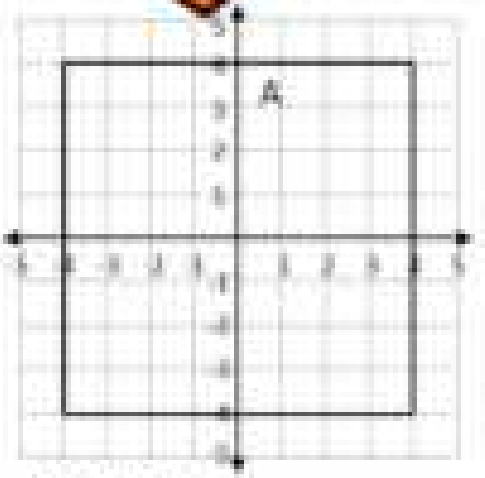
Part 12 — Draw the dilated shape on the grid



1) k = 3



2) k = 4



3) k = ½

Grade 8
E2 – Measurement

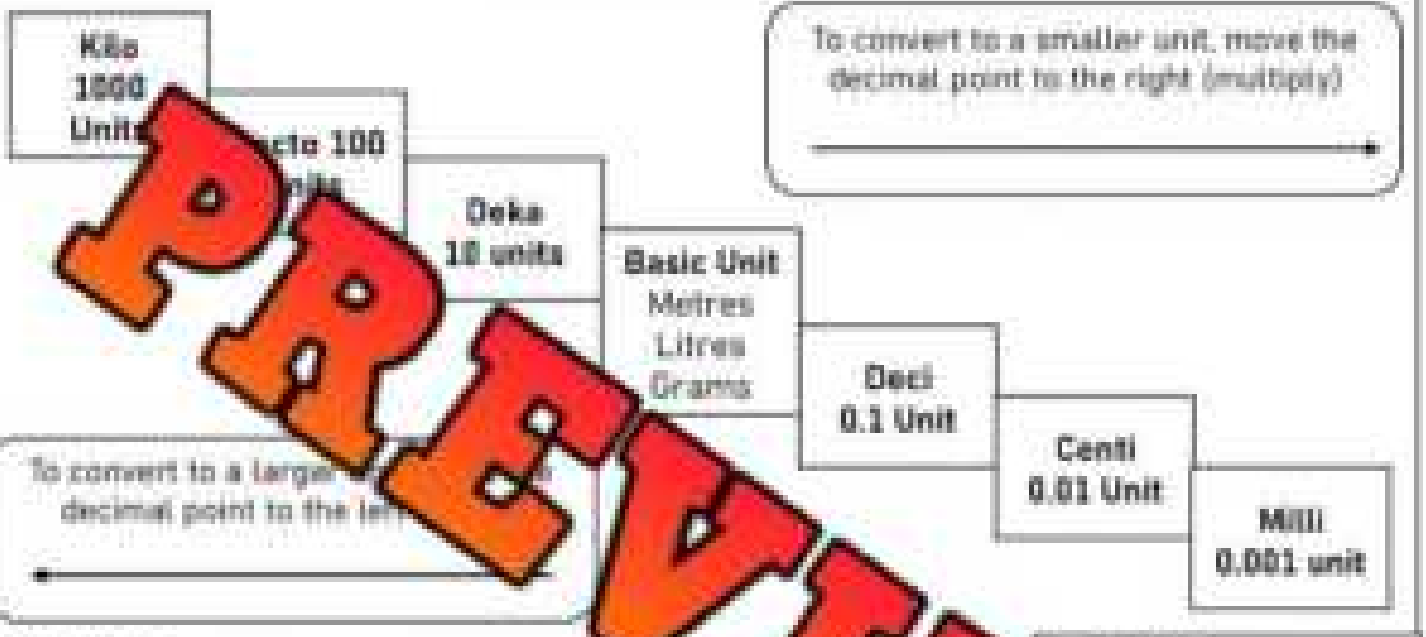
	Curriculum Expectations	Pages That Cover the Expectations
E2.1	represent very large (mega, giga, tera) and very small (micro, nano, pico) metric units using models, base ten relationships, and exponential notation	118 - 128
E2.2	solve problems involving angle properties, including the properties of intersecting and parallel lines and of polygons	129 - 150
E2.3	solve problems involving the perimeter, circumference, area, volume, and surface area of composite two-dimensional shapes and three-dimensional objects, using appropriate formulas	151 - 202
E2.4	describe the Pythagorean relationship using various geometric models, and apply the theorem to solve problems involving an unknown side length for a given right triangle	203 - 228

Name: _____ 118

Converting Units - Ladder Method

We can use the ladder method to convert any metric unit of measurement to another simply by following the rules below.

Ladder Method



Instructions

1. Find your starting unit of measurement
2. Count the jumps to get to your ending unit of
3. Move the decimal the number of jumps up or do
   Moving Up = Left and Moving Down = Right

EXAMPLE
___ mL
down =
decimal 3 right)

Practice Convert the units of measurement below

1)	3.8L	_____mL	5)	7.4kg	_____g	9)	723.3L	_____kL
2)	453mg	_____g	6)	954mg	_____g	10)	251.1kg	_____g
3)	1.32cL	_____mL	7)	231.7m	_____mm	11)	15.85m	_____km
4)	605.3m	_____km	8)	735.4mg	_____kg	12)	5243.2mL	_____kL

Name: _____ 119

Large Metric Units – Mega, Giga, Tera

When we buy a hard-drive for a computer, they are sold based on their size. The first hard drive ever made was in 1956 and it held 5 megabytes. 5 megabytes is 5 000 000 bytes. In the year 2000, the best-selling hard drive was 8.4 gigabytes, which holds 8 400 000 000 bytes. Today, most hard drives hold over 1 terabyte. A terabyte holds 1,000,000,000,000 Although bytes are not part of the metric system, they are closely related and can help us remember the prefixes – mega, giga, and tera.

Instead of [illegible] all the zeros, it is common to use exponents (scientific notation) to represent [illegible] numbers.

Part 1 [illegible] notation of the numbers below

Number	Word Form	Scientific Notation
1) 15,000,000,000		
2) 3 000 000		
3) 82 000 000		
4) 103 000 000 000		
5) 7 000 000 000 000		

Number	Scientific Notation
6) 18 000 000 000 000	
[illegible]3 000 000 000	
[illegible]00 000 000	
9) [illegible]00 000	
[illegible]	

Part 2 Fill in the table below using bytes as [illegible]

Number of Bytes	Word Form	Mega, Giga, or Tera[illegible]	[illegible]tion
1) 1 000 000 000	One-billion bytes	1 Gigabyte	[illegible] $\times 10^{9}$
2) 6 000 000			
3) 12 000 000 000			
4) 110 000 000 000			
5) 26 000 000 000 000			
6) 91 000 000 000 000			

Name: _____ 121

Large Metric Units – Mega, Giga, Tera

Part 1 Fill in the tables below

Tg	Gg
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Gm	Mm
1	
2	
3	
4	
5	
6	
7	
8	
9	

Part 2 Fill in the table below using metr

Tera Metres	Giga Metres	Mega Metres	
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Name: _____ 122

Very Small Units – Mega, Nano, Pico

To measure things that are very small, we need to be able to use very small units. We commonly use milli-units to measure small things, but scientists often need to use even smaller units to measure things like atoms, molecules, and germs. A typical germ is about 1,000 nanometres.

Unit	Meaning	Scientific Notation
Micro-unit (μ)	One millionth of a unit	1×10^{-6}
[illegible]t (n)	One billionth of a unit	1×10^{-9}
[illegible]	One trillionth of a unit	1×10^{-12}

Part 1 Wri[illegible]ntific notation of the numbers below

Number	Scientific Notation	Number	Scientific Notation
1) 0.00000005		6) 0.0000000006	
2) 0.00000013		7) 0.00017	
3) 0.000000009		8) 0.[illegible]	
4) 0.000002		9) 0.[illegible]000	
5) 0.000000008		10) 0.[illegible]	

Part 2 Fill in the table below using grams as the [illegible]

Number of Grams	Word Form	Metric System Symbol	Scientific Notation
1) 0.000007	Seven Micrograms	7 μg	1×10^{-6}
2) 0.000000000004			
3) 0.000000005			
4) 0.000003			
5) 0.000000009			
6) 0.000000000002			

Name: _____ 123

Very Small Units – Micro, Nano, Pico

Part 1 Fill in the table to learn more about the small metric units

Metric Prefix	Number of Units	Number	Scientific Notation
Base-unit	1	1	$1 \times 10^{\square}$
Deci-unit (d)			
Cent[illegible] (c)			
Mil[illegible]			
[illegible]	1/1 000 000	0.000001	$1 \times 10^{\square}$
[illegible]nit (n)			
Pico-un[illegible]			

Part 2 Co[illegible]

To convert units, use the follo[illegible] above
1) Start with the first unit/number yo[illegible] and use its scientific notation to find out its exponent – powers o[illegible] exponent of -12
2) Determine the value of the exponent of the [illegible] converting to
3) Subtract the 2nd unit from the first
4) The answer you get will tell you how many ti[illegible] the number is positive, move the decimal place to the right. If it [illegible] mo[illegible] decimal left.

		Ans
1)	5cm → nm (-2 - (-9) = 7)	5.0000000[illegible]
2)	2mm → µm	
3)	3000µg → ng	
4)	80000nL → µL	
5)	40cm →nm	
6)	750nm → µm	
7)	3000ng → mg	
8)	58cm → mm	
9)	4350µg → ng	
10)	820 nL → cL	

Name: _____ 125

Converting Small and Large Metric Units

Part 1 Put the units in order from least to greatest

1)	5mm	40 000µm	520 000nm
2)	[illegible]	1Tg	400 000 000µg
3)	[illegible]	5L	500 000mL
4)	25 000mm		25000m
5)	20 000 000ng	1.5G[illegible]	[illegible] 0000 000pg

Part 2 Convert the units of measurement below

1) 500 000m	_____Mm	2) 50µm	_____mm
3) 1 000 000Mg	_____Tg	4) 1.1nL	_____pL
5) 50 000 000pL	_____µL	6) 72m	_____mm
7) 3.3Gm	_____km	8) 2505.1kg	_____Mg
9) 29.5gL	_____kL	10) 3cm	_____µm

Name: _____ 12°

Complementary Angles

Complementary Angles are two angles that add up to 90°. Therefore, the angles 40° and 50° are complementary angles because they add up to 90°. Together, complementary angles add up to make a right angle.

Example:

We can determine the missing complementary angle by subtracting the known angle from 90.

90 − 25 = ?
? = 65

Practice: Determine the complementary angles.

1)

∠A= _____°

3)

∠C= _____°

4)

∠A= _____°

5)

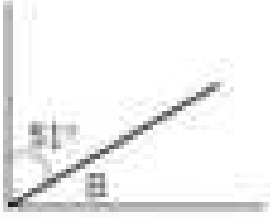
∠B= _____°

∠C= _____°

7)

∠A= _____°

8)



∠B= _____°

9)

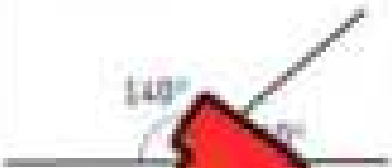
∠C= _____°

Name: ____________________ 131

Supplementary Angles

Supplementary Angles are two angles that add up to 180°. You will notice that two supplementary angles make a straight angle of 180°.

Example:



We can determine the missing supplementary angle by subtracting the known angle from 180.

180 − 25 = ?
? = 155

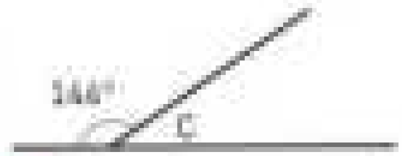
Practice: Determine the supplementary angles

1)


∠A= ______°

2)


∠B= ______°

3)


∠C= ______°

4)


∠A= ______°

5)

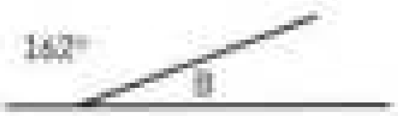

∠B= ______°

6)


∠C= ______°

7)


∠A= ______°

8)


∠B= ______°

9)

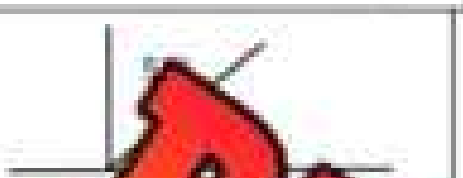

∠C= ______°

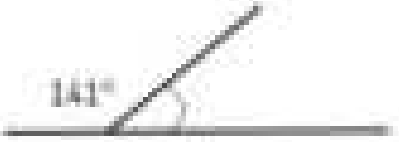
Name: _____ 134

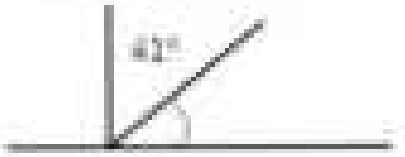
Complementary and Supplementary Angles

Part 1 Analyze the angles below. Are they complementary, supplementary or neither?

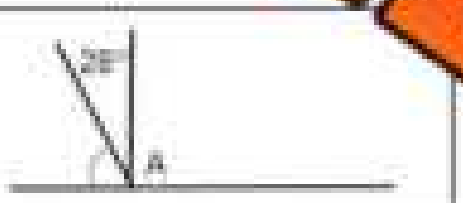
1) Original Angle



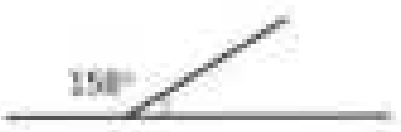




2) Original Angle



3) Original Angle



Part 2 Fill in the table by writing in the complementary and supplementary angles.

Angle	Supplementary	Complementary
13°		
44°		
81°		

Angle	Supplementary	Complementary
74°		
26°		
59°		

Name: _____ 135

Complementary and Supplementary Angles

Part 1 Write the complementary angle for each angle below

#	Angle	Complementary
1	34°	
2	66°	
3		
4		

#	Angle	Complementary
5	31°	
6	74°	
7	87°	
8	25°	

Part 2 Are the given pairs of angles complementary? Yes or No?

#	Pair	Yes/No
1	33°, 57°	
2	64°, 36°	
3	118°, 62°	

#	Pair	Yes/No
4	34°, 56°	
5	56°, 34°	
6	49°	

Part 3 Write the supplementary angle for each angle below

#	Angle	Supplementary
1	143°	
2	151°	
3	137°	
4	112°	

#	Angle	Supplementary
5		
6	165°	
7	103°	
8	114°	

Part 4 Are the given pairs of angles supplementary? Yes or No?

#	Pair	Yes/No
1	134°, 56°	
2	47°, 33°	
3	112°, 82°	

#	Pair	Yes/No
4	166°, 14°	
5	58°, 112°	
6	123°, 47°	

Name: _____ 136

Introduction – Opposite Angles

Opposite angles are a pair of angles that are directly opposite to each other and are formed by two intersecting lines.

Angles A and B are opposite angles that are congruent, meaning they have the same angle measurement.

Angles C and D are also opposite angles which means they have the same angle measurements.

Part 1 are opposite in the two intersecting lines below?

1)

___, ___ and ___, ___

2)

___, ___ and ___, ___

3)

___, ___ and ___, ___

Part 2 Which angles are opposite in the ...ctio... ...w?

1)

___, ___ and ___, ___

___, ___ and ___, ___

2)

___, ___ and ___, ___

___, ___ and ___, ___

___, ___ and ___, ___

___, ___ and ___, ___

4)

___, ___ and ___, ___

___, ___ and ___, ___

5)

___, ___ and ___, ___

___, ___ and ___, ___

6)

___, ___ and ___, ___

___, ___ and ___, ___

Name: _____ 138

Determining Angles Using Opposite and Supplementary Angles

Questions Find the values of the unknown angle measurements

1) 	2) 	3) 
A = 129°	A =	A =
B = 129°	B =	B =
C = 51°	C =	C =

4) 		6) 
A =	A =	A =
B =	B =	B =
C =	C =	C =

7) 	8) 	
A =	A =	A =
B =	B =	B =
C =	C =	C =

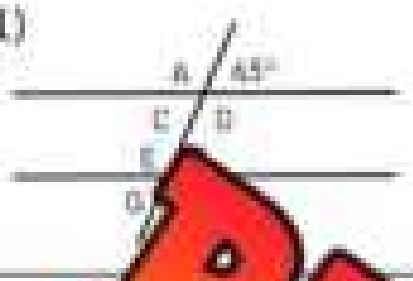
10) 	11) 	12) 
A =	A =	A =
B =	B =	B =
C =	C =	C =

Name: _____ 139

Determining Angles Using Angle Properties

Questions Find the values of the unknown angle measurements

1)



A = ___

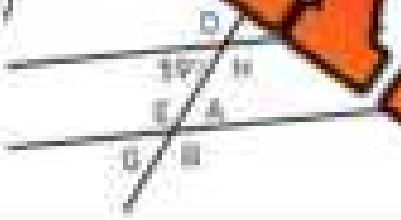
2)

A = ___, E = ___, D = ___

3)

E = ___, B = ___, D = ___

4)



A = ___, H = ___, G = ___

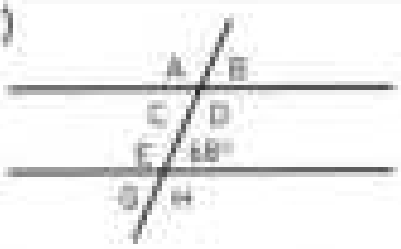
5)

A = ___, H = ___

6)

H = ___, G = ___

7)

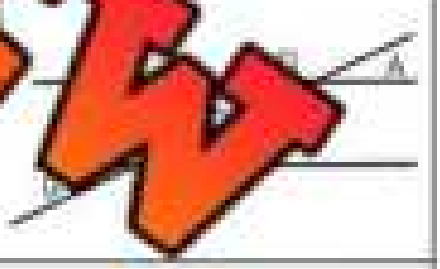


C = ___, B = ___, A = ___

8)

B = ___, D = ___, E = ___

9)



D = ___, B = ___, G = ___

10)

H = ___, G = ___, B = ___

11)

G = ___, F = ___, C = ___

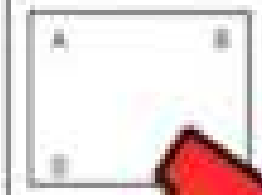
12)

A = ___, F = ___, H = ___

Name: _____ 144

Interior Angles - Quadrilaterals

Interior angles are the angles inside a shape. The interior angles of a quadrilateral will always equal 360°. We can use this information to solve for unknown angle measurements.



A rectangle has 4 equal angles that are 90°.

__ + __ + __ + __ = 360

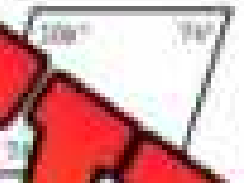
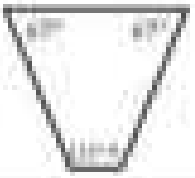
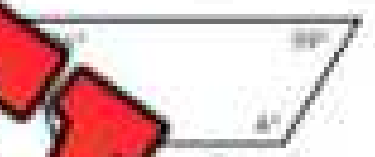
90 + 90 + 90 + 90 = 360

The trapezoid has 2 pairs of equal angles.

75 + 75 + 105 + B = 360

B = 105

Instructions: Find the values of the unknown angle measurements

1)  A =	2)  A =	3)  A =
4)  A =	5)  A =	6)  A =
7)  A =	8)  A =	9)  A =
10)  A =	11)  A =	12)  A =

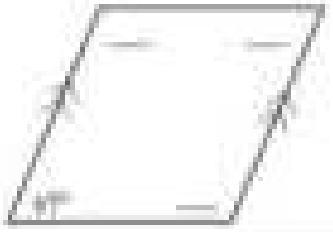
Name: _____ 145

Interior Angles - Quadrilaterals

Instructions Find the values of the unknown angle measurements. No protractors!

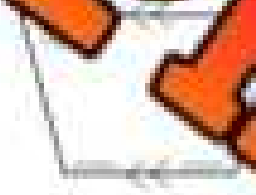
1)

2)



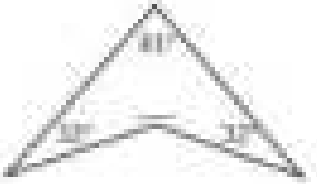
3)

4)

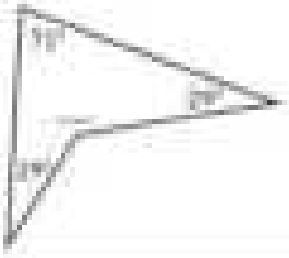


5)

6)



7)



8)

9)

10)

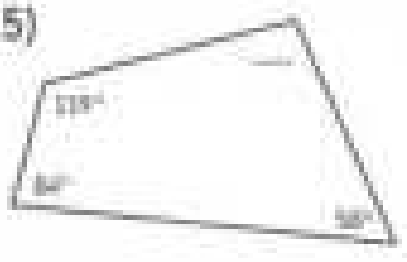
11)

12)

13)

14)

15)



Name: _____ 146

Interior Angles - Polygons

We can determine the sum of interior angles for any polygon by using the following formula: $(n - 2) \cdot 180$ (n equals the number of sides on the polygon)

Substitute the number of sides the polygon has for the variable n.
For example – A triangle has 3 sides: $(3 - 2) \times 180 = 180°$

Questions | Fill in the table below

#	Polygon / Number of Sides	Sum of Interior Angles	Regular Polygon Angle of Each Vertex
1)	3	$(n - 2) \times 180$ $(3 - 2) \times 180°$ $180 = 180°$	$\frac{180}{3} = 60°$
2)	4		
3)	5		
4)	6		
5)	7		
6)	8		
7)	9		
8)	10		
9)	20		
10)	30		
11)	48		

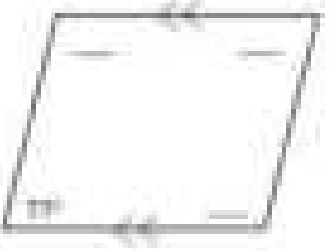
Name: _____ 147

Interior Angles - Polygons

Questions Find the value of the unknown angle using the measurements provided

1)

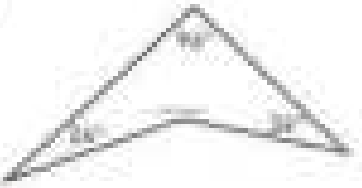
2)



3)

4)

6)

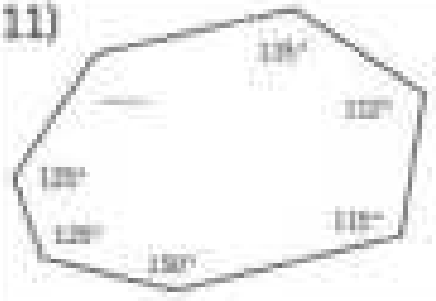


7)

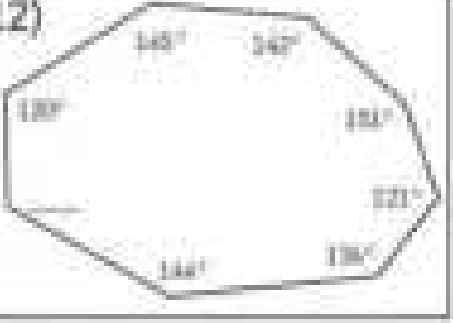
8)

10)

11)



12)



Name: ____________________

Unit Quiz – Metric System and Lines/Angles

Part 1 Fill in the tables below

Tg	Gg
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Gm	Mm
1	
2	
3	
4	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
9	
10	

µm	nm
1	
2	
3	
4	
5	
6	
7	
8	
[illegible]	
[illegible]	

ng	pg
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Part 2 Put the units in order from le[illegible]eat[illegible]

1) 7mm	70 000µm	[illegible]0nm

2) 350 000kg	3Tg	[illegible]µg

Part 3 Convert the units of measurement below

1) 500 000g	____________Mg	2) 60µm	____________mm
3) 2 000 000Mg	____________Tg	4) 3.1nL	____________pL
5) 60 000 000pL	____________µL	6) 82m	____________mm

Part 4 Write the complementary angle for each angle below

#	Angle	Complementary
1	37°	
2	63°	
3	84°	

#	Angle	Complementary
4	46°	
5	72°	
6	55°	

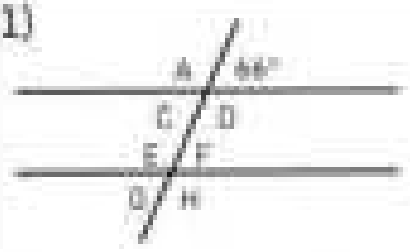
Part 5 Write the supplementary angle for each angle below

#	Angle	Supplementary
1	123°	
2	144°	
3	157°	

#	Angle	Supplementary
4	82°	
5	171°	
6	106°	

Part 6 Find the values of the unknown angles in these diagrams

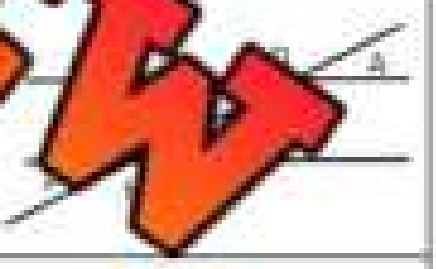
1)



A = ___, H = ___, G = ___

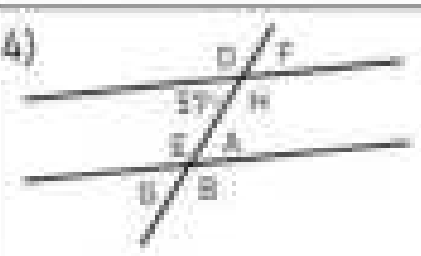
2)

A = ___, E = ___, D = ___



E = ___, B = ___, D = ___

4)



A = ___, H = ___, G = ___

5)

A = ___, F = ___, G = ___

6)

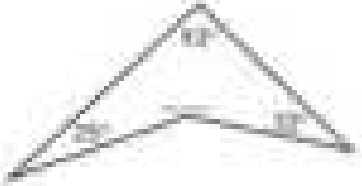
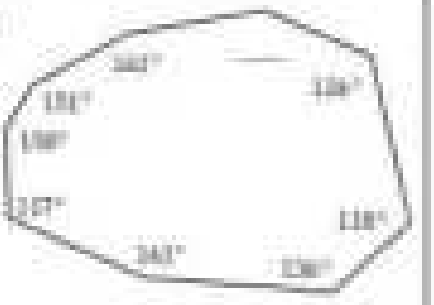
A = ___, H = ___, G = ___

Part 7 Fill in the table below

#	Polygon – # of Sides	Sum of Interior Angles	Regular Polygon Angle of Each Vertex
1)	5		
2)	7		
3)			
4)			
5)	20		
6)	30		

Part 8 Find the values of the unkno

1) 	2) 	
A =	A =	A =

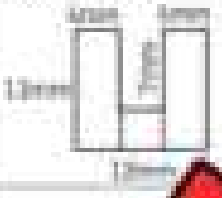
4) 	5) 	6) 

Name: _____ 152

Area of Composite Polygons

Find the area of the polygons below by splitting them into separate shapes.

Example



Area = area of rectangle 1 + area of rectangle 2 + area of rectangle 3

Rectangle 1:
A = 11 x 4
A = 44 mm²

Rectangle 2:
A = 4 x 4
A = 16mm²

Rectangle 3:
A = 4 x 11
A = 44mm²

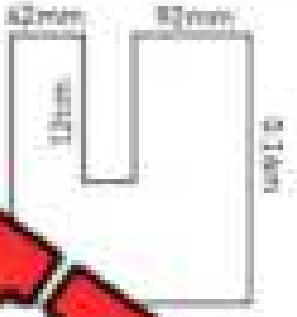
Area = 44 + 44 + 16
A = 104mm²

Instructio Find the area of the composite polygons below

1)

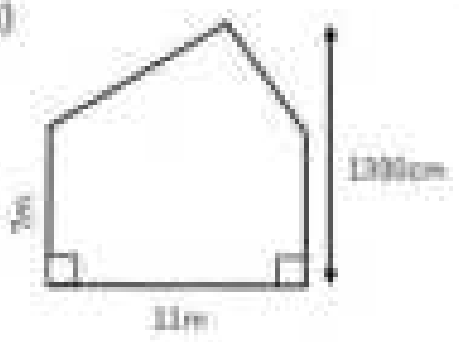
Area = _____

2)



Area = _____

3)

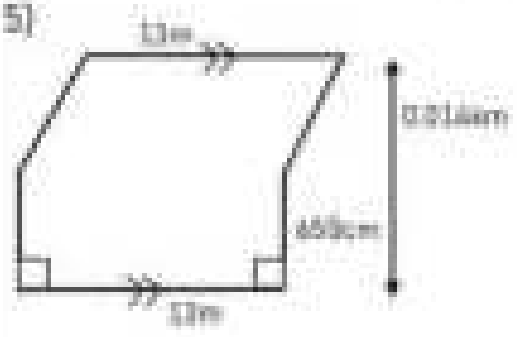


Area = _____

4)

Area = _____

5)



Area = _____

6)

Area = _____

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

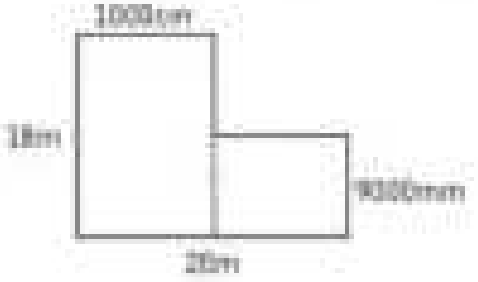
Name: _____

Find the area of composite shape

Area = _____

Name: _____

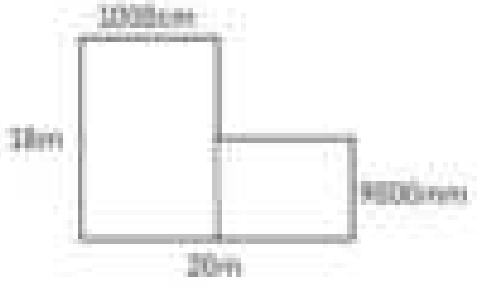
Find the area of composite shape



Area = _____

Name: _____

Find the area of composite shape



Area = _____

Name: _____

Find the area of

Area = _____

Name: _____ 155

Calculating Radius and Diameter

Calculating Radius Formula

$r = \frac{d}{2}$ or $r = d \div 2$

Calculating Diameter Formula

$d = 2r$ or $d = r \times 2$

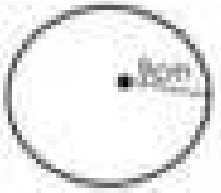
Instruction Find the radius and diameter of each circle below

1)

Radius = _____

Diameter = _____

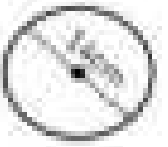
2)



Radius = _____

Diameter = _____

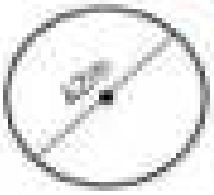
3)



Radius = _____

Diameter = _____

4)



Radius = _____

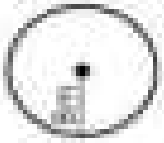
Diameter = _____

Radius = _____

Diameter = _____

6)

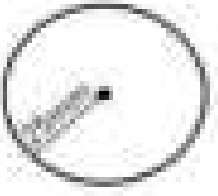
7)



Radius = _____

Diameter = _____

8)



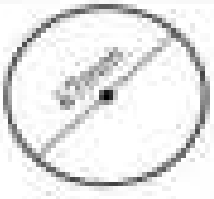
Radius = _____

Diameter = _____

Radius = _____

Diameter = _____

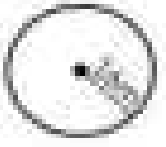
10)



Radius = _____

Diameter = _____

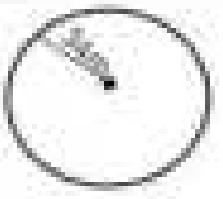
11)



Radius = _____

Diameter = _____

12)



Radius = _____

Diameter = _____

Name: _____ 157

Calculating Circumference

Calculating Circumference (Diameter)
$c = \pi d$ or $c = \pi \times d$

Calculating Circumference (Radius)
$c = 2\pi r$ or $c = 2 \times \pi \times r$

Part 1 Fill in the table with the missing information

	Radius	Diameter	Circumference
1)	7cm		
2)			
3)		25m	
4)		48cm	
5)	2		
6)			
7)	3.8km		
8)	8.5m		
9)			
10)		54.8	

Part 2 Answer the word problems below

1)	Aiden is deciding which pizza to buy. He has two options. Option A: Pizza with a radius of 22cm Option B: Pizza with a circumference of 138cm Which pizza is larger? 	
2)	You need to wrap a label around a can. If the diameter of the can is 11.5cm, what length does the label need to be? 	
3)	Alesa needs to wrap a cake she made with a ribbon. The cake has a radius of 16.25cm. How long does the ribbon need to be? 	

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

1) Fill in the table with the missing information. ($c = \pi d$ & $c = 2\pi d$)

	Radius	Diameter	Circumference
1)	13m		
2)		39m	
3)	11m		
4)		77m	

2) A circular garden has a radius of 7.5 m. You want to put a fence around the entire garden. How long does the fence need to be?

Name: _____

1) Fill in the table with the missing information. ($c = \pi d$ & $c = 2\pi d$)

	Radius	Diameter	Circumference
1)	13m		
2)		39m	
3)	11m		
4)		77m	

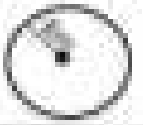
2) A circular garden has a radius of 7.5 m. You want to put a fence around the entire garden. How long does the fence need to be?

Name: _____ 159

Area of a Circle - Radius

The area of a circle is the part inside the circle. We can calculate the area of a circle by using its radius. For most calculations, we can use 3.14 for pi. The formula is pi x radius^2. We can write this as $a = \pi r^2$

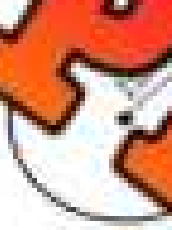
Calculating Area Using Radius



$a = \pi r^2$
$a = \pi \times 8 \times 8$
$a = 200.96m^2$

Practice Calculate the area of the circles using the radius

1)



Radius = _____

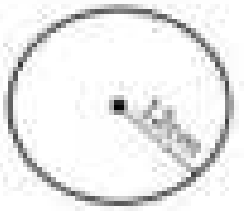
Area = _____

2)

Radius = _____

Area = _____

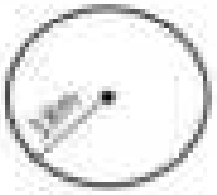
3)



Radius = _____

Area = _____

4)



Radius = _____

Area = _____

5)

Radius = _____

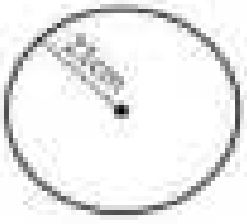
Area = _____

6)

Radius = _____

Area = _____

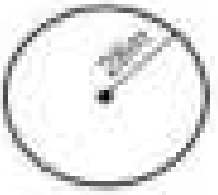
7)



Radius = _____

Area = _____

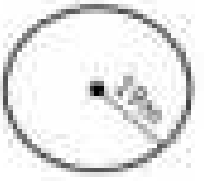
8)



Radius = _____

Area = _____

9)



Radius = _____

Area = _____

Name: _____ 161

Circles – Mixed Review

Practice | Fill in the blanks below

1)

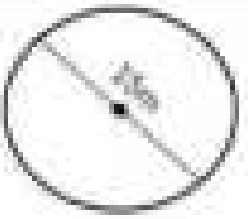
Radius = _____

Diameter = _____

Circumference = _____

Area = _____

2)



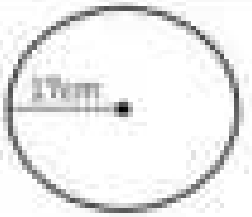
Radius = _____

Diameter = _____

Circumference = _____

Area = _____

3)



Radius = _____

Diameter = _____

Circumference = _____

Area = _____

4)

Radius = _____

Diameter = _____

Circumference = _____

Area = _____

5)

Radius = _____

Diameter = _____

Circumference = _____

Area = _____

6)

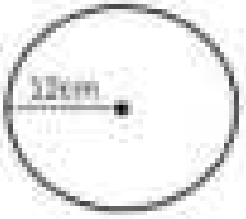
Radius = _____

Diameter = _____

Circumference = _____

Area = _____

7)



Radius = _____

Diameter = _____

Circumference = _____

Area = _____

8)

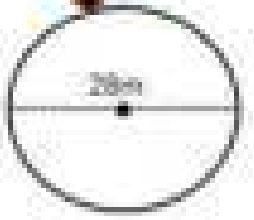
Radius = _____

Diameter = _____

Circumference = _____

Area = _____

9)



Radius = _____

Diameter = _____

Circumference = _____

Area = _____

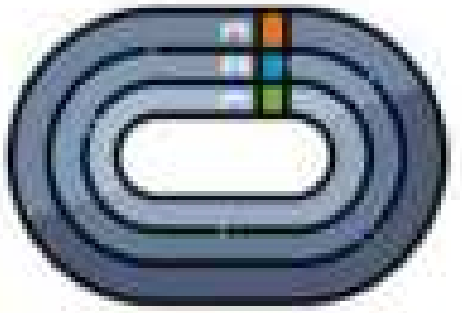
Name: _____ 1&2

Math Race: Circumference, Radius, Diameter, and Area

Objective — What are we learning about?

Students will practice calculating the circumference, radius, diameter, and area of circles by quickly answering related questions in a competitive and engaging game format. They will learn how to estimate these values using pi = 3.

Materials — What you will need for the activity



- [illegible] circumference, radius, [illegible]r, and [illegible]les
- Optional: T[illegible]
- Chairs ar[illegible]rcle

Instructions — How [illegible]ctivity

1. Setup: Arrange chairs in a circle, [illegible]ed in a chair. One student stands behind a seated student to [illegible] ga[illegible]
2. Explain the Game: Explain to the students [illegible] will [illegible]ating in a race around the circle by answering questions [illegible]cu[illegible], diameter, and area. The goal is to move around the entire circ[illegible] to [illegible]inal position. Students should use mental math and esti[illegible] = [illegible]
3. Start the Game: The teacher reads out a question (e.g., "[illegible] of a circle with a radius of 3 cm?").
4. Answering the Question: The standing student and the seated studen[illegible]nt of them compete to answer the question first. The student who answers correctly first moves to stand behind the next seated student, while the other student remains seated.
5. Continue the Race: The teacher continues reading out questions, and the process repeats. The standing student continues to move around the circle, answering questions at each stop.
6. Winning the Game: The first student to make it around the entire circle and return to their original position wins the race.
7. Review: After the game, review some of the questions and answers with the class to reinforce the concepts and ensure understanding.

Name: _____ 164

Questions | Use the questions below for the game

A cylindrical can has a circumference of 30 cm at its base. What is the can's diameter?	10 cm
A round placemat has a radius of 12 cm. What is the circumference of the placemat?	72 cm
The area of a circular fountain is 27 square metres. What is the diameter of the fountain?	6 metres
A round p[illegible]ound has a circumference of 48 metres. What is the radius of the playg[illegible]	8 metres
The ar[illegible]ground is 300 square metres. What is the radius of the [illegible]	10 metres
The ar[illegible] a circ[illegible]ce [illegible]12 square metres. What is the radius of the clock?	2 metres
A round wall clo[illegible]diam[illegible]. What is the circumference of the clock?	90 cm
A circular pizza pan has a [illegible]. What is the radius of the pan?	10 cm
A circular garden plot has a radius of [illegible]. What is the circumference of the plot in centimetres?	240 cm
A round clock's face has a diameter of 16 cm. W[illegible]e a[illegible]ock's face?	192 cm²
The area of a circular trampoline is 75 square metres. [illegible]mp[illegible] diameter.	10 [illegible]tres
A cylindrical water tank has a circumference of 150 cm at its base. [illegible] radius of the base?	[illegible] cm
A round hot tub has a radius of 3 metres. What is the area of the hot tub in square centimetres?	2,700 cm²
The diameter of a circular sticker is 9 cm. Calculate the circumference of the sticker.	27 cm
A circular track has a circumference of 60 metres. What is the radius of the track?	10 metres
The area of a round park bench is 300 square centimetres. Find the radius of the bench.	10 cm
A circular plate has a circumference of 30 cm. What is the plate's diameter?	10 cm
A round fountain has a diameter of 12 metres. Calculate the area of the fountain in square metres.	108 m²

Name: _____ 170

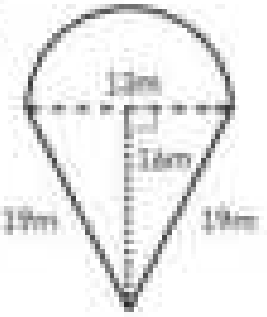
Perimeter of Composite Shapes

Questions: Find the perimeter of each composite shape

1)

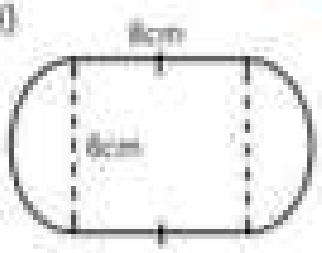
Perimeter: _____

2)



Perimeter: _____

3)

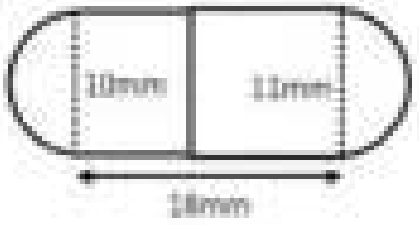


Perimeter: _____

4)

Perimeter: _____

5)



Perimeter: _____

6)

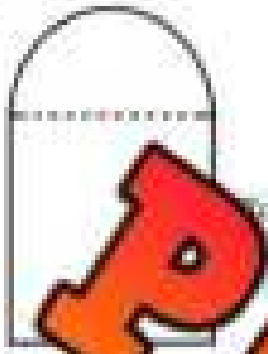
Perimeter: _____

Name: _____ 172

Area of Composite Shapes

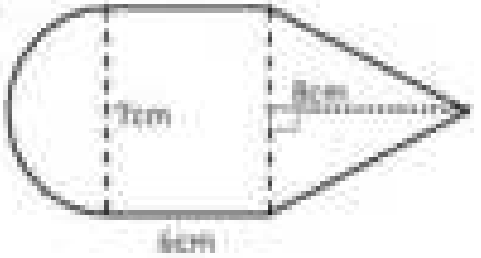
Questions: Find the area of each composite shape

1)



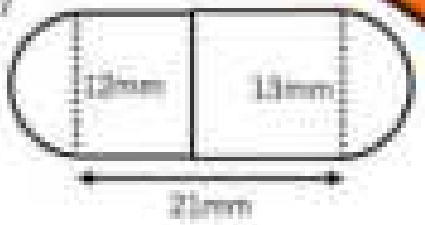
Area: _____

2)



Area: _____

3)

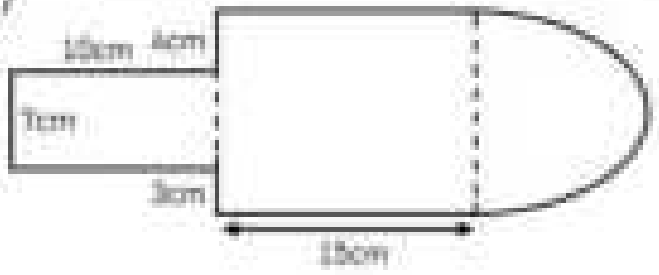


Area: _____

4)

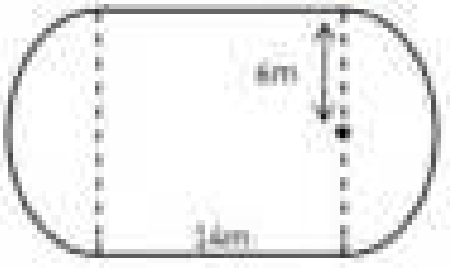
Area: _____

5)



Area: _____

6)



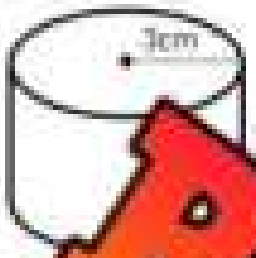
Area: _____

Name: _____ 175

Surface Area - Cylinders

Questions | Solve the questions below

1)

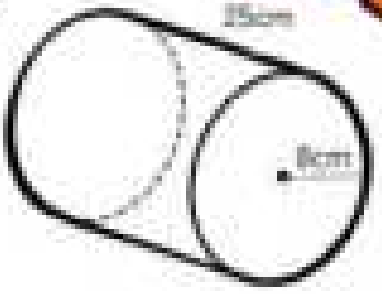


Surface Area: _____

2)

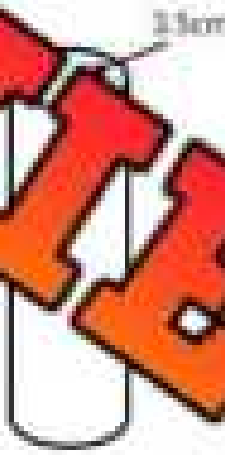
Surface Area: _____

3)



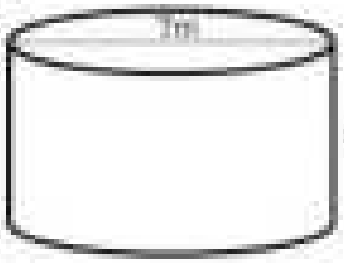
Surface Area: _____

4)



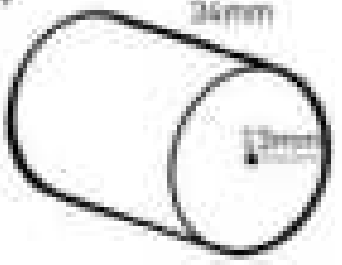
Surface Area: _____

5)



Surface Area: _____

6)



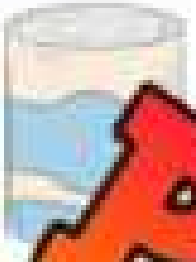
Surface Area: _____

Name: _____ 176

Surface Area - Cylinders

Instruction Solve the questions below

1) A can of soup has a diameter of 9cm and a height of 19cm. What is the surface area of the can?



2) A can of tuna has a radius of 7.5cm and a height of 42cm. What is the surface area of the can?

3) A battery is composed of 2 cylinders. The main battery cylinder has a radius of 3cm and a height of the main cylinder is 8cm. The smaller cylinder on top of the battery has a diameter of 8mm and a height of 1cm.

What is the total surface area of the battery?

4) A barrel has a diameter of 74cm and a height of 1.62m. What is the surface area of the barrel?

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

Name: ____________________

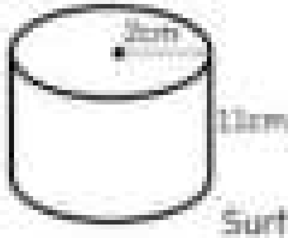
1) Solve the questions below

2) A soda can is m... with a radius of 6 cm a... 15 cm. Draw its net and ca... surface area of the can.

____

Name: ____________________

1) Solve the questions below



Surface Area: __________

2) A soda can is modeled as a cylinder with a radius of 6 cm and a height of 15 cm. Draw its net and calculate the surface area of the can.

____

Name: ____________________

1) Solve the questions below

Surface Area: __________

2) A soda can is modeled as a cylinder with a radius of 6 cm and a height of 15 cm. Draw its net and calculate the surface area of the can.

____

Name: ____________________

1) Solve the questions below

Surface Area: __________

2) A soda can is modeled as a cylinder with a radius of 6 cm and a height of 15 cm. Draw its net and calculate the surface area of the can.

____

Name: _____ 178

Surfaces Area Using Nets - Cylinders

Instruction Solve the questions below

1) A toilet paper roll is 16cm tall with a radius of 6cm. The inside cylinder is a hole. It has a diameter of 3cm.

What is the surface area of the toilet paper roll. Remember to account for the hole.

2) A wheel of brie cheese is tall. is 9cm long. What is the surface area of the full wheel of ch

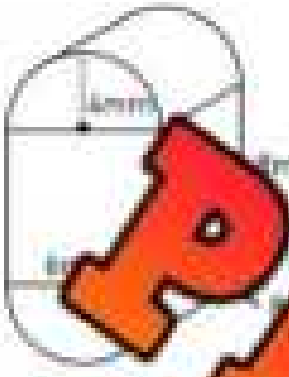
3) A pot has no lid on top. The pot is 14cm tall and has a radius of 10cm. What is the surface area of the pot?

Name: _____ 180

Surface Area – 3D Composite Objects

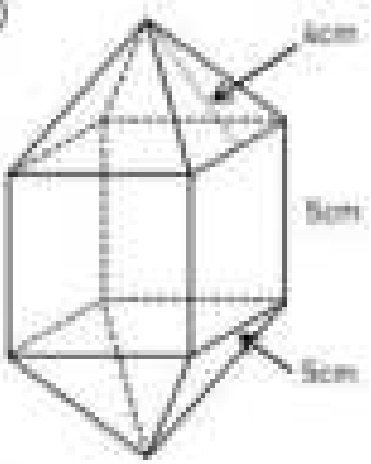
Questions | Find the surface area of the 3D composite objects

1)



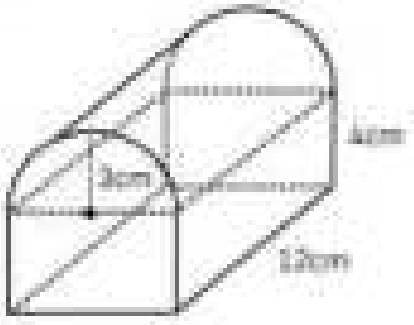
Surface Area: _____

2)



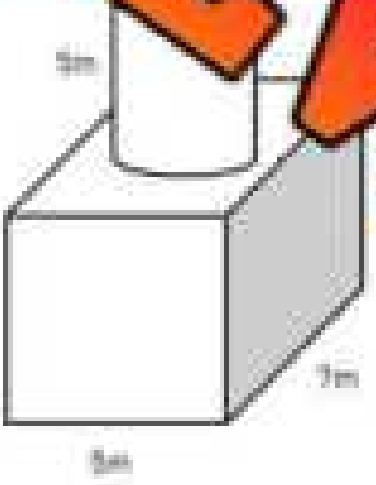
Surface Area: _____

3)



Surface Area: _____

4)



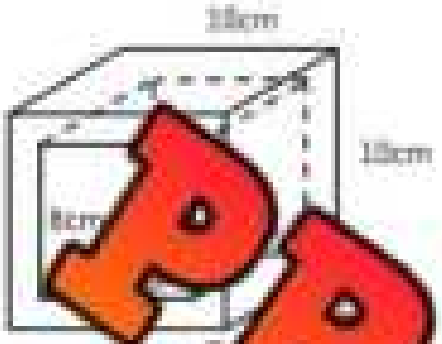
Surface Area: _____

Name: _____ 182

Surface Area – 3D Composite Objects

Questions Find the surface area of the 3D objects below. Note the holes!

1)

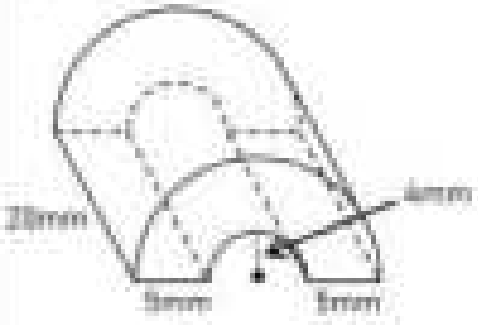


Surface Area: _____

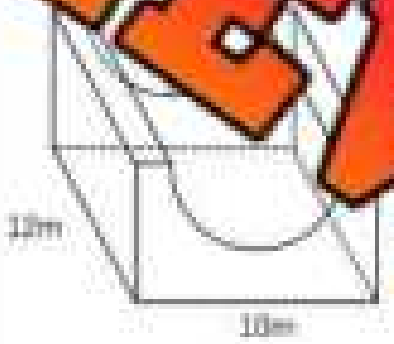
2)

Surface Area: _____

3)



Surface Area: _____



Surface Area: _____

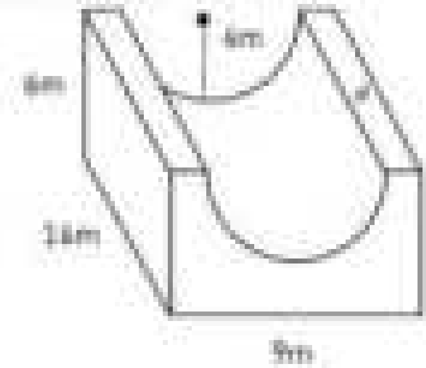
Name: ______________________ 183

Surface Area – Word Problems

Questions | Answer the word problems below

1) A half-pipe skateboard ramp has been built with the dimensions below.

a) What is the surface area of the half-pipe?

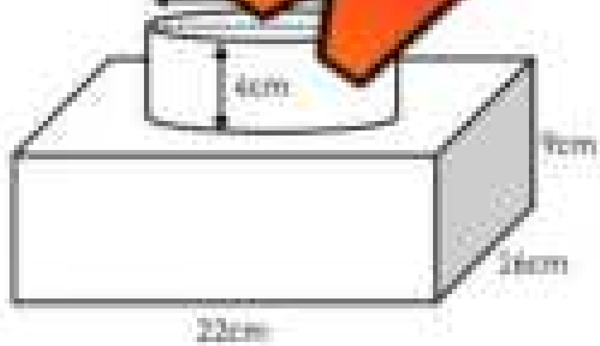


PREVIEW

b) When a skateb[illegible] how much room is there for them to land on the top or [illegible]? [illegible] the dimensions of the area that is labelled with an *a*?

2) Courtney made a two-layer cake using a rec[illegible] [illegible]nder. Instead of using icing between the two-layers, she [illegible] [illegible] hold them together. Courtney will cover the outside of the ca[illegible] [illegible] the bottom).

a) What is the area that will be covered by jam (two surfaces)?



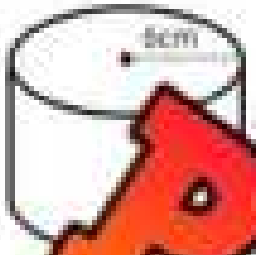
b) What is the area that will be covered in vanilla icing?

Name: _____ 186

Volume - Cylinders

Questions | Solve the questions below

1)

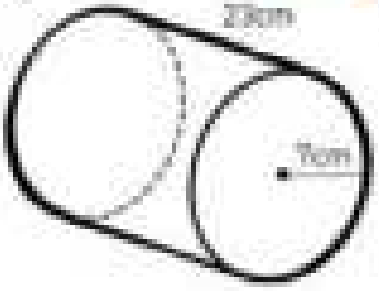


Area of the Base: _____ Volume: _____

2)

Area of the Base: _____ Volume: _____

3)

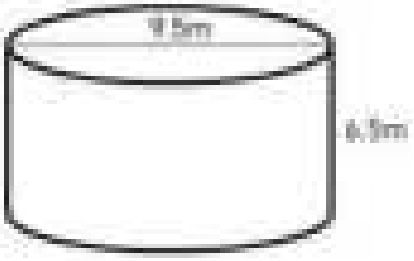


Area of the Base: _____ Volume: _____

4)

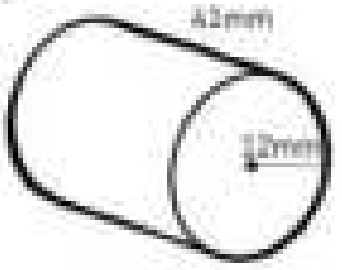
Area of the Base: _____ Volume: _____

5)



Area of the Base: _____ Volume: _____

6)



Area of the Base: _____ Volume: _____

Name: _____ 187

Volume of Cylinders

Part 1 Fill in the blanks to investigate the area of the base and the volume

	Radius	Area of Base	Height	Volume
1)	9 mm		13 mm	
2)	mm		15 mm	
3)			10 cm	
4)			6 km	
5)	9		8 cm	
6)	13 cm		11 cm	
7)	6 m		12 m	
8)	9 m		m	

Part 2 Answer the questions below

1) The radius of a swimming pool is 4.1 metres [illegible] of the pool is 1.3 metres. What is the volume of the swimming pool?

2) A can's base has an area of 37 cm^2. The volume of the can is 407cm^3. What is the height of the can?

3) A bucket has a height of 9cm. The bucket's base has an area of 22cm^2.

a) What is the volume of the bucket?

b) If 1cm^3 of volume has the capacity to hold 1mL of water, how many mL can the bucket hold?

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

1) Fill in the blanks to investigate the area of the base, height, and the volume.

	Radius	Area of Base	Height	Volume
1)	6cm		10cm	
2)	4cm		15cm	
3)	2.5cm		20cm	392.5cm³
4)	7cm	154cm²		924cm³

2) A cylindrical water tank has a base area of 200 cm² and a height of 2 meters.

a) What is the volume of the water tank in cubic centimeters (cm³)?

b) If 1 liter of water is equal to 1,000 cm³, how many liters of water can the tank hold?

Name: _____

1) Fill in the blanks to investigate the area of the base, height, and the volume.

	Radius	Area of Base	Height	Volume
1)	6cm		10cm	
2)	4cm		15cm	
3)	2.5cm		20cm	392.5cm³
4)	7cm	154cm²		924cm³

2) A cylindrical water tank has a base area of 200 cm² and a height of 2 meters.

a) What is the volume of the water tank in cubic centimeters (cm³)?

b) If 1 liter of water is equal to 1,000 cm³, how many liters of water can the tank hold?

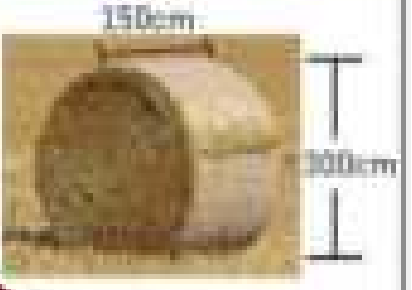
Name: _____ 190

Volume of Cylinders

Instruction Answer the questions below

1) There are two types of hay bales – one that is in the shape of a cylinder and one that is in the shape of a rectangular prism. The cylinder-shaped hay bale is 300cm tall and 150cm long. The rectangular-shaped hay bale has the following dimensions: 1.5m by 1.0m by 2.0m.

a) Which type of hay bale contains more hay?



b) Joel thinks that a rectangular-shaped hay bale will fit in a cylinder-shaped hay bale out of 3 rectangular-shaped hay bales. Is he right? Explain.

2) You are planning to make candles to sell. What would the dimensions of the candles be?

a) Draw a picture of one of the candles and label the dimensions.

b) What is the volume of the candle?

c) For every $10cm^3$, it costs you 30 cents. How much would the candle cost you in total?

Name: _____ 191

Activity: "Cylinder Volume Toss Challenge"

Objective — What are we learning about?

Students will reinforce their understanding of finding the volume of cylinders through a fun, team-based activity that involves answering volume problems and shooting a paper ball into a bin.

Materials — What you will need for the activity.

- [illegible]
- [illegible] team
- Paper ball[illegible]
- Bins or ba[illegible]
- Desks (one p[illegible]

Instructions — How yo[illegible]

1. Arrange the classroom so that th[illegible]ough[illegible]ultiple teams to work simultaneously. Place a desk about [illegible] feet [illegible] a [illegible]ket.
2. Place a stack of index cards with area pro[illegible]n e[illegible]
3. Provide each team with a recording sheet and [illegible]
4. Divide the students into teams of about five membe[illegible]
5. Each team stands in a line behind their respective desk[illegible]
6. The first student in line flips over an index card and solves the [illegible]o the volume of a cylinder on the recording sheet.
7. Once the answer is recorded, the student attempts to shoot the pape[illegible]ll into the bin.
8. If the student makes the shot, they place a tally mark on the team's tally sheet for a point. If they miss, no tally is given.
9. The student then goes to the end of the line, and the next student steps up to the desk to repeat the process.
10. The activity continues until all index cards have been solved.
11. Once all index cards are completed, the teacher collects the recording sheets and reviews the answers with the class.
12. For each incorrect answer, the team loses one point.
13. The team with the highest number of points after deductions is declared the winner.

Name: _____ 192

Index Cards | Cut out the cards below

A water tank has a radius of 2 m and a height of 4 m. What is the volume of the tank?

A cylindrical candle has a radius of 3 cm and a height of 8 cm. What is the volume of the candle?

A cylindrical [illegible] of 6 cm and a [illegible] its volu[illegible]

A cylindrical barrel has a diameter of 2 m and a height of 5 m. Find the volume of the barrel.

A can of paint has a diameter of 10 cm and a height of 20 cm. Calculate the volume of the can.

A gas ta[illegible] of [illegible] cm³ and a rad[illegible] height of [illegible]

The volume of a cylinder is 1000 cm³ and the height is 10 cm. Find the radius of the base.

A cylindrical container has a radius of 7 cm and a height of 15 cm. What is its volume?

Name: _____ 196

Index Cards | Cut out the cards below

A cylindrical pipe has a radius of 4 cm and a height of 10 cm. What is the volume of the pipe?

A cylindrical water tank has a radius of 3 m and a height of 8 m. What is the volume of the tank?

A large silo [illegible] and a height of [illegible] volume of [illegible]

A container has a base area of 100 cm^2 and a height of 25 cm. Find the volume of the container.

A cylindrical vase has a radius of 6 cm and a height of 15 cm. What is the volume of the vase?

A soda [illegible] and a height of 12 [illegible] volume [illegible]

The volume of a cylindrical drum is 2000 cm^3 and the radius is 5 cm. Find the height of the drum.

A cylinder has a volume of 1200 cm^3 and a height of 10 cm. What is the radius of its base?

Name: _____ 195

Cylinder Volume Toss Challenge

Answers Record your answers below

Question	Answer
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

Question	Answer
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	

Tally Chart Record your makes in the tally chart below

Tallies – Made Shots	Total

Wrong Answers	Final Score

Name: _____ 196

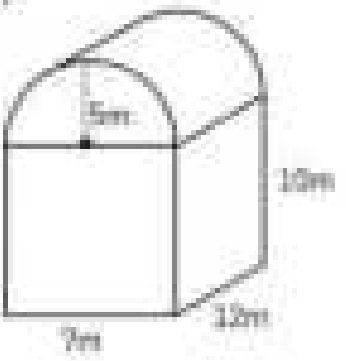
Volume – 3D Composite Objects

Questions Find the volume of the 3D objects

1)

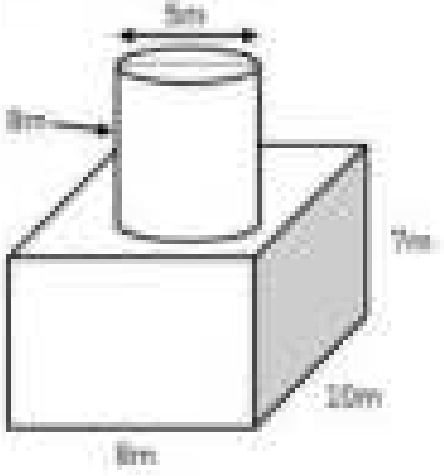
Volume: _____

2)

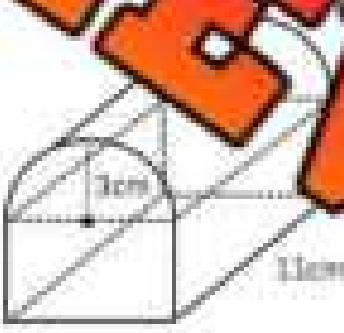


Volume: _____

3)



Volume: _____



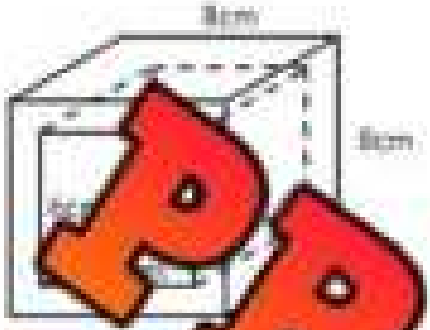
Volume: _____

Name: _____ 197

Volume – 3D Composite Objects

Questions Find the volume of the 3D objects that have holes in them

1)

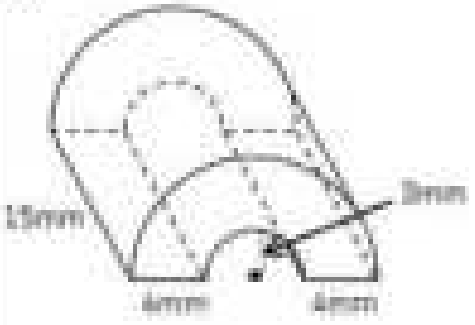


Volume: _____

2)

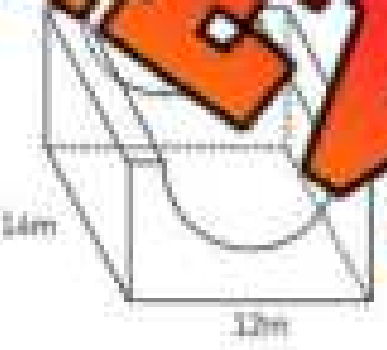
Volu _____

3)



Volume: _____

4)



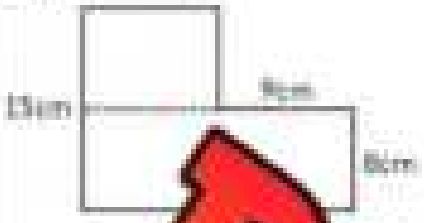
Volume: _____

Name: _____ 199

Unit Test – Surface Area and Volume

Part 1 Find the area and perimeter of each composite shape

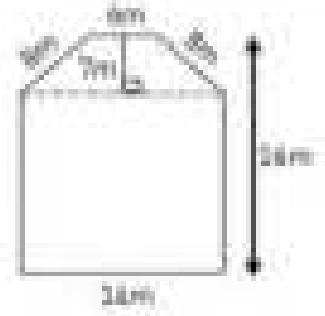
1)



Perimeter: _____

Area: _____

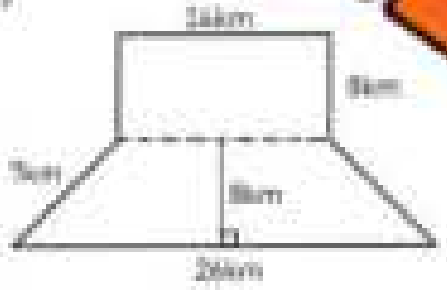
2)



Perimeter: _____

Area: _____

3)



Perimeter: _____

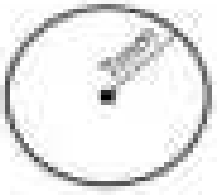
Area: _____

Perimeter: _____

Area: _____

Part 2 Fill in the blanks below

1)



Radius = _____

Diameter = _____

Circumference = _____

Area = _____

2)

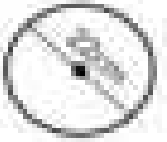
Radius = _____

Diameter = _____

Circumference = _____

Area = _____

3)



Radius = _____

Diameter = _____

Circumference = _____

Area = _____

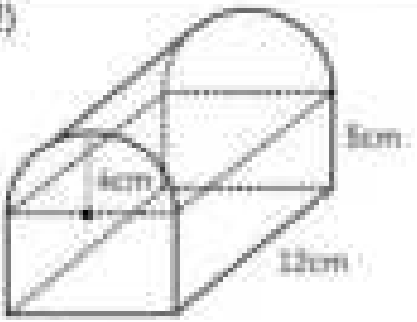
Part 6 Find the volume and surface area of the 3D objects below

1)

Volume: _____

Surface Area: _____

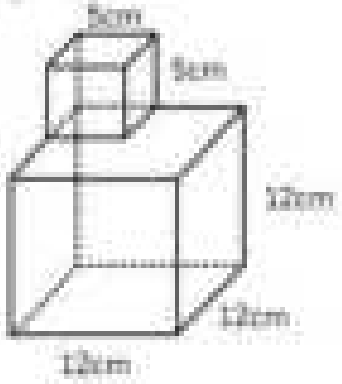
2)



Volume: _____

Surface Area: _____

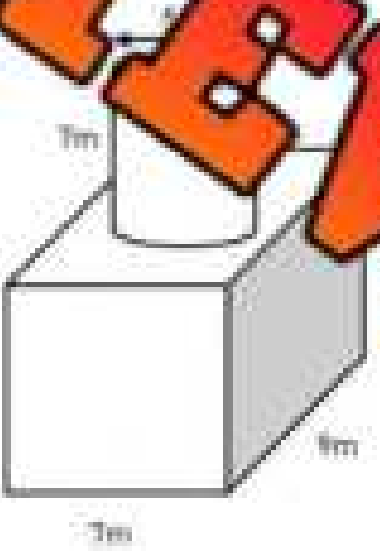
3)



Volume: _____

Surface Area: _____

4)



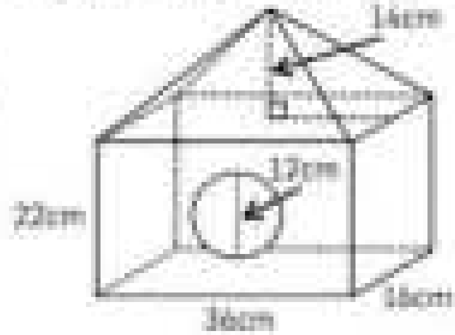
Volume: _____

Surface Area: _____

Part 7 | Answer the word problems below

1) Josh is building a wooden birdhouse. The dimensions of the birdhouse have been displayed on his diagram below.

What is the surface area of the birdhouse with the hole?



2) A half-pipe skateboard ... b... ...h the dimensions below.

a) What is the surface area of the h...?

b) How much space does the half-pipe occupy?

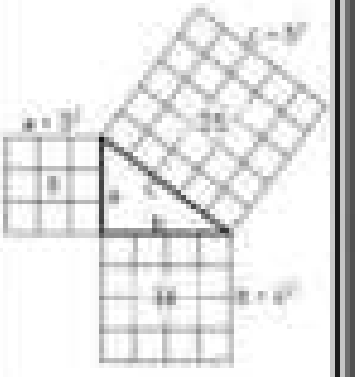
Name: _____ 203

Intro – Pythagorean Theorem

The properties of a right triangle can be used to find an unknown side length. The longest side of a right triangle is always opposite the 90° angle and is called the **hypotenuse**.

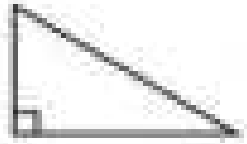
The formula for calculating the length of the hypotenuse is: $a^2 + b^2 = c^2$

- If side a is 3 units long, then a square on this side has an area of 3^2 or 9.
- If side b is 4 units long, then a square on this side has an area of 4^2 or 16.
- If the area of side c is equal to the combined areas of the squares on sides a and b, then the square on side c must have an area of 25 (9 + 16). This means the length of side c must be $\sqrt{25}$.

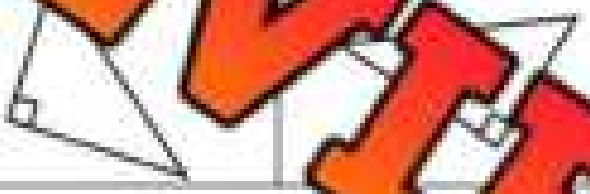


Part 1 — Label the sides of the triangles: a, b, and c

1)



2)



4)

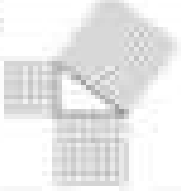
Part 2 — Evaluate

	Question	Answer
1)	3^2	
2)	8^2	
3)	10^2	
4)	$\sqrt{36}$	

	Question	Answer
5)	$\sqrt{144}$	
6)	$\sqrt{16}$	
7)	7^2	
8)	$\sqrt{121}$	

Part 3 — Label the triangles: a, b, c and fill in the blanks to find their values

1)

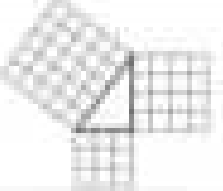


$a^2 + b^2 = c^2$

___ + ___ = ___

Hypotenuse = _____

2)



$a^2 + b^2 = c^2$

___ + ___ = ___

Hypotenuse = _____

Name: _____ 205

Pythagorean Theorem – Word Problems

Instructions Answer the questions below

1)	In a right-angled triangle, the lengths of the two shorter sides are 3 cm and 4 cm. What is the length of the hypotenuse?
2)	...e triangle has one leg that measures 8 meters and another leg that measures ... What is the length of the hypotenuse?
3)	A building is 30 meters tall, and a ladder is leaning against the top of the building. If the base of the ladder is 25 meters away from the building, how long is the ladder?
4)	A rectangular billboard is 15 meters tall and 20 meters wide. A pole runs from the bottom corner to the top corner. How long is the pole?
5)	A rectangular garden is 12 meters long and 8 meters wide. If a diagonal path is drawn across the garden, what is the length of the path?

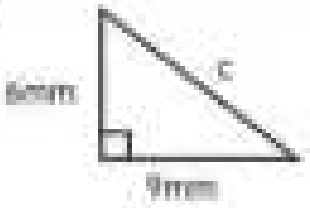
Name: _____ 207

Pythagorean Theorem – Missing Side

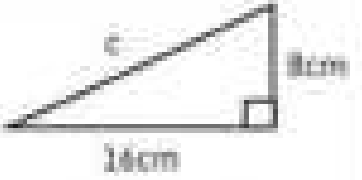
Instructions Find the value of the hypotenuse. Round the answer to the nearest tenth

1)

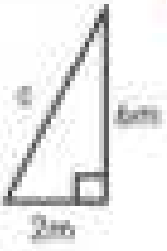
2)



3)



4)

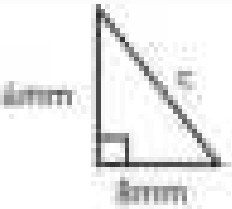


5)

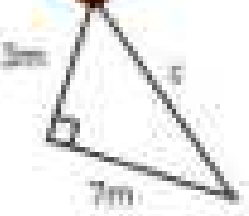
6)

7)

8)



9)



Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: ______________________

1) Find the value of the missing side.

2) A rectangular park measures 45m by 60m. A diagonal path cuts across the park. Find the length of the path to the nearest tenth.

Name: ______________________

1) Find the value of the missing side.

2) A rectangular park measures 45m by 60m. A diagonal path cuts across the park. Find the length of the path to the nearest tenth.

Name: ______________________

1) Find the value of the missing side.

2) A rectangular park measures 45m by 60m. A diagonal path cuts across the park. Find the length of the path to the nearest tenth.

Name: ______________________

1) Find the value of the missing side.

2) A rectangular park measures 45m by 60m. A diagonal path cuts across the park. Find the length of the path to the nearest tenth.

Name: _____ 210

Pythagorean Theorem – Word Problems

Instructions Answer the word problems below

1) Find the hypotenuse of a right triangle with a base of 10cm and a height of 6cm.

2) Lily walks 4 km south and 3 km east. Calculate how far Lily is away from her starting point.

3) Julian built a triangular garden with the dimensions below. If he wanted to put a fence around his garden, how long does the fence need to be?

4) Ivy's house is a rectangular shape that is 15m wide by 9m long. What is the diagonal of her house (from corner to corner)?

5) An envelope has the dimensions below. What is the height of the envelope?

Name: _____ 211

Pythagorean Theorem – Missing Side

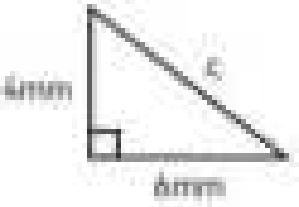
Instructions Find the value of the missing side. Record your answer as a square root.

1)

$\sqrt{180} = c$

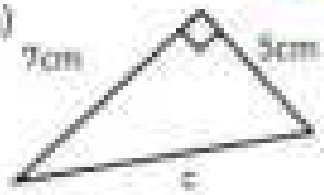
$c = \sqrt{180}$

2)

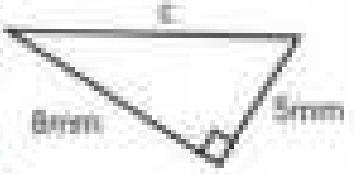


3)

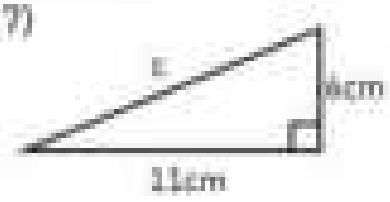
4)



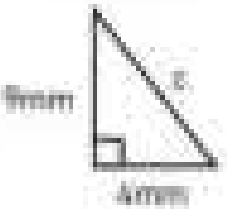
5)



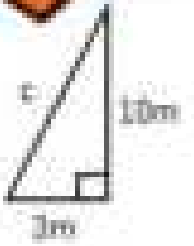
7)



8)



9)

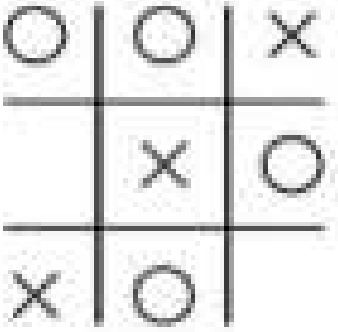


Name: _____ 213

Math Tic-Tac-Toe: Pythagorean Challenge

Objective What are we learning about?

Students will practice using the Pythagorean Theorem to find the missing side of right triangles in a fun, competitive game of tic-tac-toe. This activity will reinforce their problem-solving skills and teamwork.



Materials What you will need for the activity

- Whiteboard or chalkboard
- Markers or chalk
- Pre-written Pythagorean theorem problems (one for each cell of the tic-tac-toe grid)

Instructions How you will complete the activity

1) **Preparation**: Hand out Tic-Tac-Toe worksheets to pairs of students. Each worksheet should have a large tic-tac-toe grid with a different Pythagorean Theorem problem in each cell. One side of each triangle is missing in each problem.

2) **Instructions**:
   - Students will play individually against each other, with one player using "X" and the other "O."
   - The student playing "X" will go first. They will choose a cell, solve the Pythagorean Theorem problem in that cell, and check their answer with their partner. If the solution is correct, they place an X in that cell.
   - If the answer is incorrect, they do not place their mark, and it becomes the "O" player's turn. The "O" player will then choose a cell, solve the problem, and check their answer. If correct, they place an O in that cell.
   - The game continues with alternating turns.

3) **Winning the Game**: The first player to get three marks in a row (horizontally, vertically, or diagonally) wins the game.

4) **Discussion**: After the game, students should discuss with their partner the different strategies they used to solve the problems and any challenges they faced during the activity.

Name: _____ 214

Tic-Tac-Toe

Use the following tic-tac-toe grids for the game.

Lily walked 5 km south and 12 km east. How far is she from her starting point?

Jacob's rectangular garden measures 18 m by 24 m. Find the diagonal length.

Lucas paddled his kayak 4 km north and 3 km east. How far is he from his starting point?

David climbs 12m up a tree and moves 5m to the right on a branch. What is his diagonal distance from the tree base?

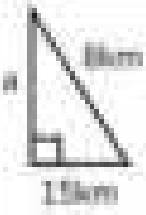
The base of a TV screen measures 48cm, and the height is 36cm. Find the diagonal size of the screen.

A rectangular rug is 9 m wide and 12 m long. What is the diagonal length?

Ella's garden is a rectangle measuring 28m by 15m. Find the diagonal length.

Daniel cycled 9km west and 12 km north. How far is he from his starting point?

Find the hypotenuse: right triangle with legs of 12cm and 16cm.



Name: _____ 216

Tic-Tac-Toe Use the following tic-tac-toe grids for the game.

Chris's living room measures 5 m by 12 m. Find the diagonal length.	Lisa climbs 3 m up a ladder and moves 4 m sideways on a scaffold. What is her diagonal distance from the ground?	A triangle has legs of 5 cm and 12 cm. What is the hypotenuse?
A rectangular field is 12m wide and 3[illegible] long. Wha[illegible] the di[illegible] leng[illegible]	c 34km 16km	29km a 25km
46cm 13cm	[illegible]	Ava jogged 7 km west and 24 km south. How far is she from her starting point?
24cm 19cm c	15cm c 20cm	[illegible]
Nathan walked 3km north and 4km east. Calculate the distance from his starting point.	12km a 16km	Hannah hikes 15km east and 20 km south. How far is she from the starting point?
26cm 10cm	Mia flew her drone 8m upward and 15 m to the right. Calculate the diagonal distance.	Jamie's rectangular swimming pool measures 20m by 25m. Find the diagonal length.

Name: _____ 217

Pythagorean Theorem – Word Problems

Instruction Answer the word problems below

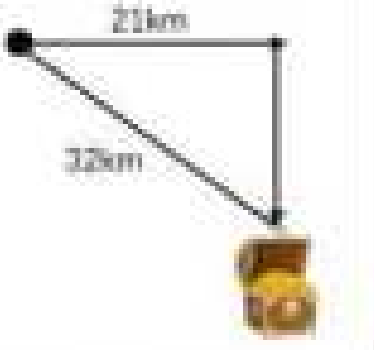
1) Robert has a 4m ladder that he is using to get as high as possible to hang his Christmas lights. He puts the ladder 2 metres away from the wall.

a) Label the dimensions on the diagram

b) How [illegible] the top of the ladder off the ground?

2) Howard has a huge [illegible] very tall bookshelf. He needs to climb 9m to find the book he wa[illegible] the top of the ladder to be at the height of the book he wants. How far [illegible] put the ladder away from the bookshelf?

3) A pirate is on a treasure hunting missing. His GPS tells him he is 32km away from the treasure. He decides to travel 21km due east. The GPS now tells him that the treasure is due south from where his boat is. How far south does he need to travel to find the treasure?



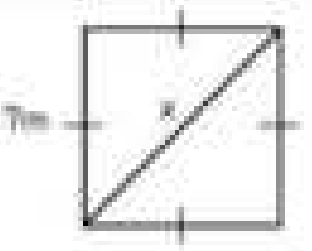
Name: _____ 220

Pythagorean Theorem – Missing Side

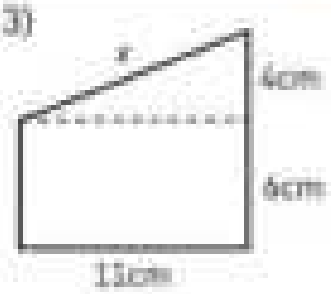
Instruction Find the value of x.
Round the answer to the nearest tenth or leave as a square root

1)

2)

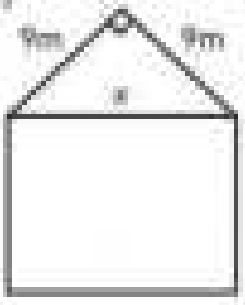


3)

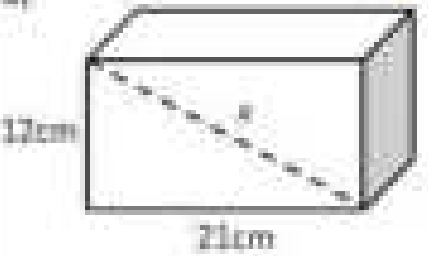


4)

5)



6)



Name: _____ 221

Pythagorean Theorem – Word Problems

Instruction Answer the word problems below

1) TVs are measured diagonally from corner to corner. Jeffrey wants a 150cm TV. He likes the look of one that has a base of 140cm and a height of 54cm. Is the TV 150cm diagonally?

2) To get from [illegible] you need to walk around the pond. To avoid the pond, you walk [illegible] and 45 [illegible]. To the nearest metre, how many metres would you have saved if you could have walked through the pond?

3) A baseball diamond is a square with sides of 30m. What is the distance between first base and third base?

4) The local fire department has been called to a burning building. They need their ladder to reach the 4th floor, which is 22m high. They know that the ladder will need to be at least 12m away from the building. If they brought a 25m ladder, will they reach the fourth floor?

Exit Cards

Cut Out: Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Real-life Pythagorean theorem problems. Find the value of the missing side.

1) A tree is 20 m tall and casts a shadow 15 m long on the ground. What is the distance from the top of the tree to the end of the shadow?

2) A ramp is used to load equipment onto a truck. The ramp is 2 m high and 4 m long along the ground. What is the length of the ramp itself?

Name: _____

Real-life Pythagorean theorem problems. Find the value of the missing side.

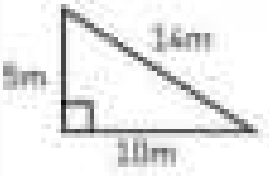
1) A tree is 20 m tall and casts a shadow 15 m long on the ground. What is the distance from the top of the tree to the end of the shadow?

2) A ramp is used to load equipment onto a truck. The ramp is 2 m high and 4 m long along the ground. What is the length of the ramp itself?

Name: _____ 224

Identify Right Triangles – Pythagorean Theorem

We can use the Pythagorean Theorem to find out if a triangle is a right triangle or not. If we have all the measurements of the triangle, we can plug them into the equation. If the equation is true, the triangle is a right triangle and if it is false, it is not.



Solution

$a^2 + b^2 = c^2$

$5^2 + 11^2 = 14^2$

$25 + 121 = 196$

$146 \neq 196$

This equation is false, therefore this is not a right triangle

Questions Is the triangle a right triangle?

1) 3cm 4cm Yes No

2) 12m 13m No

3) 3mm 7mm 5mm Yes No

4) 25m 24m 7m Yes No

5) 13mm 8mm 4cm Yes No

7) 12m $\sqrt{340}$m 14m Yes No

8) 19mm 17mm 5mm Yes No

9) $\sqrt{416}$cm 4cm 20cm Yes No

Name: _____ 225

Pythagorean Theorem – Word Problems

Directions Draw and label the triangles and decide if the triangles are right or not.

1) In the triangle ABC, the sides AB, BC, and AC measure 7cm, 24cm, and 25cm respectively. Is the triangle a right triangle?

2) In the tri[illegible] JK, KL, and JL measure 5cm, 12cm, and 14cm respectiv[illegible] triangle?

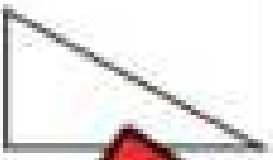
3) In the triangle PQR, the sides PQ, QR, a[illegible]mm, and 61mm respectively. Is the triangle a right tri[illegible]

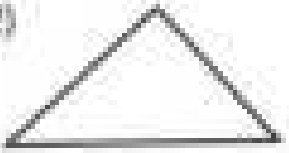
4) In the triangle XYZ, the sides XY, YZ, and XZ measure 20cm, 20cm, and 29cm respectively. Is the triangle a right triangle?

Name: _____ 227

Pythagorean Theorem – Quiz

Part 1 Label the sides of the right triangles: a, b, and c

1) 

2) 

3) 

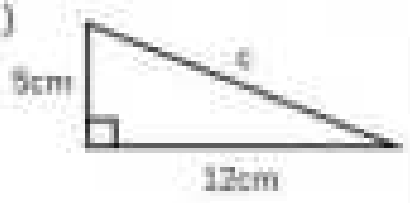
4) 

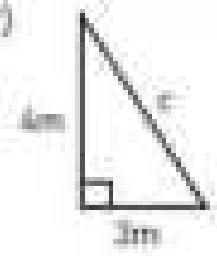
Part 2

	Question	Answer
1)	7^2	
2)	9^2	
3)	$\sqrt{16}$	

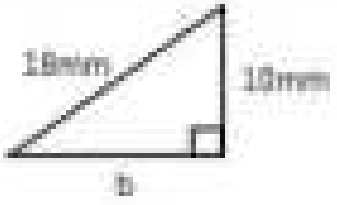
	Question	Answer
4)	$\sqrt{121}$	
5)	$\sqrt{64}$	
6)	6^2	

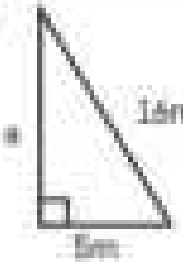
Part 3 Find the value of the missing side

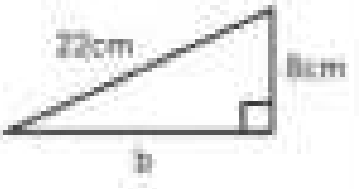
1) 

2) 

3) 

4) 

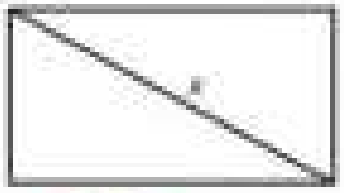
5) 

6) 

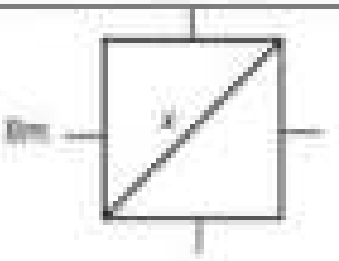
Name: _____ 228

Part 4 Find the value of x.
Round the answer to the nearest tenth or leave as a square root.

1)



2)



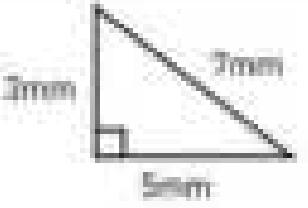
Part 5 ...gle a right triangle?

1)

Yes No

Yes No

3)



No

Part 6 Is the triangle a right triangle?

1) A 14m ladder is leaning against a house. The bottom of the ladder is ...s from the house. How high does the ladder reach to the nearest tenth?

2) A building casts a shadow of 10m on the ground. The length from the top of the building to the end of the shadow is 26m. How tall is the building?