Grade 6

Strand: Number

	Curriculum Expectations	Pages
N01	Students will be expected to demonstrate an understanding of place value for numbers greater than one million and less than one-thousandth.	5 – 15, 20 – 23, 25 – 26
N02	Students will be expected to solve problems involving whole numbers and decimal numbers.	16 – 19, 24
N0?	Students will be expected to demonstrate an understanding of factors and multiples by ~~a determining multiples and factors of numbers less than 100~~	5~~4 – 75~~

Preview of 125 pages from this product that contains 354 pages total.

N0		9
N0	~~ratio, concretely, pictorially, and symbolically~~	8
N06	Students will be expected to demonstrate an understanding of percent (limited to whole numbers) concretely, pictorially, and symbolically.	113 – 130
N07	Students will be expected to demonstrate an understanding of integers contextually, concretely, pictorially, and symbolically.	131 – 150
N08	Students will be expected to demonstrate an understanding of multiplication and division of decimals (one-digit whole number multipliers and one-digit natural number divisors).	76 – 112
N09	Students will be expected to explain and apply the order of operations, excluding exponents, with and without technology (limited to whole numbers).	30 – 53

Name: _____

Place Value Chart

5 213 572 483

Billions			Millions			Thousands			Ones		
Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones
		5	2	1	3	5	7	2	4	8	3

Questions — Fill in the Place Value Charts below

1) 3 521 785 246

Billions			Millions			Thousands			Ones		
Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones

2) 1 ... 28 356

Billions			Millions			Thousands			Ones		
Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones

3) 9 237 031 ...

Billions			Millions			Thousands			Ones		
Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones

4) 2 125 284 275

Billions			Millions			Thousands			Ones		
Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones

5) 8 368 547 941

Billions			Millions			Thousands			Ones		
Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones

Place Value - Billions

| Part 1 | Circle the digit for each place value written |

	Number	Digit
1)	245 842	Ten thousands place
2)	8 581 578	Millions place
3)	42 846 285	Thousands place
4)	99 542	Ten-millions place
5)	86 18	Hundred-millions place
6)	52	Hundred-thousands place
7)	5 879 63 8	One-thousands place
8)	3 896 748 223	billions place
9)	2 758 951 154	ds place
10)	7 856 578 452	

| Part 2 | What place value is underlined? |

	Number	Place Value
1)	8 545 121 848	
2)	3 565 215 835	
3)	3 455 458 489	
4)	9 753 602 574	
5)	5 410 848 496	

Name: _____

Place Value - How Many...

Number	Billions	Millions	Thousands	Ones
5 158 322 457	5	158	322	457

Part 1   How many of each are the numbers made up of? Fill in the table below

	Number	Billions	Millions	Thousands	Ones
1)	...45 842				
2)	...				
3)	2 79...				
4)	2 571 945 3...				
5)	6 833 854 198				
6)	8 052 050 187				
7)	4 478 756 054				
8)	3 457 681 362				
9)	2 314 685 114				
10)	3 546 820 047				

Part 2   How many of each are the numbers made up of? Fill in the table below

1)	How many hundreds are in one-thousand?	
2)	How many thousands are in one-million?	
3)	How many millions are in one-billion?	

Name: _____

Expanded Form

Questions	What is the expanded form of the numbers below?

1) 6 753 501 003

6 000 000 000 + 700 000 000 + 50 000 000 + 3 000 000 + 500 000 + 1 000 + 3

2) 2 851 460 000

3) 9 128 700 000

4) ___ 108 318

5) ___ 20___

6) 5 104 705 ___

7) 7 852 620 500

8) 4 870 008 985

9) 5 586 900 084

10) 7 842 000 541

Name: _____

Expanded Form

Questions | What is the standard form of the numbers below

1) 5,000,000,000 + 800,000,000 + 40,000,000 + 100,000 + 20,000 + 3,000 + 400 + 50 + 6

5,840,123,456

2) 2,000,000,000 + 100,000,000 + 7,000,000 + 800,000 + 10,000 + 200 + 30 + 5

3) 9,0_____ 40____ __0 + 50,000,000 + 600,000 + 70,000 + 8,000 + 900 + 10 + 2

4) 6,000,000,000 + 9____ __0 + 8____ __00 + 6,000 + 500 + 40 + 3

5) 3,000,000,000 + 700,000,000 + 10,000,0____ ____00 ____ + 20 + 30 + 6

6) 4,000,000,000 + 500,000,000 + 80,000,000 + 900,____ 70____ ____ __0 + 30 + 2

7) 7,000,000,000 + 100,000,000 + 20,000,000 + 400,000 + 50,000 + 6,0__

8) 1,000,000,000 + 200,000,000 + 30,000,000 + 400,000 + 50,000 + 6,000 + 700 + 80 + 9

9) 8,000,000,000 + 300,000,000 + 10,000,000 + 500,000 + 900 + 20 + 6 + 500 + 30 + 5

10) 5,000,000,000 + 20,000,000 + 300,000 + 5,000 + 7,000 + 800 + 90 + 4 + 3

Written Form

1 – One	5 – Five	9 – Nine	13 – Thirteen	17 – Seventeen	30 – Thirty	70 – Seventy
2 – Two	6 - Six	10 – Ten	14 – Fourteen	18 - Eighteen	40 – Forty	80 – Eighty
3 - Three	7 – Seven	11 – Eleven	15 – Fifteen	19 – Nineteen	50 – Fifty	90 – Ninety
4 – Four	8 – Eight	12 - Twelve	16 – Sixteen	20 - Twenty	60 - Sixty	100 - Hundred

Part 1 Write the standard form of the written words below

1) Seven h___ eighty-six million, six hundred th___ thousand, two hundred fifty-eigh___

2) Nine hundred twenty-five million, seven hundred sixty-three thousand, three hundred twelve

3) Eighty___ o milli___ red seventy-two thousand, ___ elev___

4) Six-hundred twenty-one million, eight hundred thirty-two thousand, one hundred thirty-nine

5) Four hundred seventy-___ million, fiv___ hundred eighty thousand, one ___ ninety-nine

6) Five hundred forty-nine million, three ___ d twelve thousand, one hundred ___

Part 2 Write the written form of the ___ ers ___

1) 134 345 142

_____

_____

2) 412 527 351

_____

_____

3) 645 512 257

_____

_____

4) 274 464 495

_____

_____

Zero As Placeholder

1 – One	5 – Five	9 – Nine	13 – Thirteen	17 – Seventeen	30 – Thirty	70 – Seventy
2 – Two	6 - Six	10 – Ten	14 – Fourteen	18 – Eighteen	40 – Forty	80 – Eighty
3 - Three	7 - Seven	11 – Eleven	15 – Fifteen	19 – Nineteen	50 – Fifty	90 – Ninety
4 – Four	8 – Eight	12 - Twelve	16 – Sixteen	20 – Twenty	60 – Sixty	100 – Hundred

Part 1 — Ben finished his homework! Find his errors and correct them

Question	Ben's Answer	Correct Answer
1) Sev...	7010	
2) Eighty-one th...	81 40	
3) Four-hundred s...-ei...-six	478 6	
4) Ninety-four million, one...	94 100	
5) Five-hundred million, seventy...	...0570	
6) Eighty-eight million, thirty-one	81...	
7) One hundred three million, four thousand		
8) One billion, one million, one thousand, one	100 100 01...	

Part 2 — What is wrong with Ben's answer below? Explain.

Question	Ben's Answer	Why is Ben's answer wrong?
Five billion, two hundred thousand, six	5 200 006	_____ _____ _____ _____

Place Value - Number Breakdown

Questions | Fill in the blanks below

Number Breakdown

301 048 082

B		T M	M	H Th	T Th	Th	H	T	O

Write the expansive form of the number below

_____

Fill in the pattern below

301 048 082 , _____ , _____ , 301 048 085 , 301 048 086

Fill in the pattern below

301 048 082 , 301 049 082 , _____ , 301 0__ 082 , _____

Fill in the pattern below

301 048 082 , _____ , 303 048 082 , _____ , 305 048 082

301 048 082	+10 000	
301 048 082	+1 000 000	
301 048 082	+ 100 000 000	
301 048 082	− 10 000 000	
301 048 082	− 1 000	

Reading Large Numbers

The sequence of numbers never ends – they are infinite! The concept of **infinity** relates to the idea that there is no last number or largest number as there is always a larger number.

Part 1	Write the standard form of the number. <u>Hint</u>: Billions = 9 Zeros	
1)	Seven billion, two-hundred forty-eight million, six-hundred twenty-one thousand, one-hundred eighty-eight.	
2)	Four hundred twenty-eight million, five-hundred ninety-one thousand, four-hundred sixty-three.	
3)	Two hundred five hundred sixty-two million, one-hundred fifty-two thousand, three-hundred fifty-five.	
4)	Nine-hundred seventy-five four-hundred forty-six million, five-hundred ninety-two thousand, one-hundred eighty-nine.	
5)	One-hundred sixty-four billion, five hundred thirty-eight million, four-hundred thirty-nine thousand, seven hundred thirty-seven.	

Part 2	Write the standard form of the number. Hint: Trillions = 12 Zeros	∞
1)	Five trillion, one hundred forty billion, six-hundred ninety-eight million, two-hundred twenty-five thousand, one-hundred twenty-six.	
2)	Seven hundred sixty-one trillion, four hundred thirty-three billion, one-hundred sixty-five million, seven-hundred eighty-eight thousand, five-hundred seventy-two.	
3)	Nine hundred twenty-six trillion, four hundred eighty-five billion, one hundred eighteen million, seven hundred seventy-five thousand, nine hundred twelve.	
4)	Fourteen trillion, 5 billion, eight hundred twenty-seven million, five hundred thousand, eighty.	

Solving Large Calculations - Which Operation?

Solving large calculations requires us to understand which operation we need to use. We use each operation for different purposes, including:

- **Addition**: combining, counting, finding a total
- **Subtraction**: take away, finding the difference, how much is left
- **Multiplication**: groups of, repeated addition
- **Division**: sharing equally in groups, repeated subtraction

Questions — circle which operation you will use for the word problem and then solve it

1)	world's ... in 2020 was 7 800 000 000. In 1950, the popul... 500 000 000. How many more people live on E... 20 th... (What is the difference?)	+ − X ÷
2)	Amazon earned $386 0... 0 0... $280 000 000 000 in 2019. How ... mone... mazon earn in 2019 and 2020 together...	+ − X ÷
3)	The Prime Minister of Canada earns $365 200 ... Assuming a Prime Minister works for 4 years, how ... money will they earn as Prime Minister?	− X ÷
4)	Canada's GDP was 1 570 000 000 000 in 2020 and 1 170 000 000 000 in 2005. How much more money did Canada earn in 2020?	+ − X ÷
5)	A company earned $35 964 000 with 243 staff members. If they split the earnings up equally, how much would each staff member receive?	+ − X ÷

Large Numbers - Calculation Mistakes

Questions	Megan's homework has errors. Can you fix them?

1)	The Rogers Centres in Toronto has a maximum attendance of 53 503 people. If the Toronto Blue Jays sell out their arena for 81 home games, how many people will have attended their baseball games?
Megan's Answer	53 503 ÷ 81 = 660.55
Your Correction	

2)	There are 60 minutes in an hour, 24 hours in a day, and 365 days in a year. How many minutes are there in a year?
Megan's Answer	60 x 24 x 365 = 8 840 000
Your Correction	

3)	The top 5 companies in Toronto made the following money last year: (5) $2 935 642 (4) $5 842 587 (3) $8 785... (2) $12 685 415 (1) $21 448 102 How much more did the top two companies earn than the bottom 3 companies?
Megan's Answer	Bottom 3 – 2 935 642 + 5 842 574 + 3 785 256 = 12 563 472 Top 2 – 12 685 415 + 21 448 102 = 34 133 517 Answer – 12 563 472 + 34 133 517 = <u>46 697 042</u>
Your Correction	

Place Value Using Decimals

Decimal numbers are any numbers that represent a value less than one. We use a decimal point to represent that a number can be less than one. We would represent a single cookie with the number 1, but we can still represent a quarter of a cookie by writing 0.25. The 0 is the whole number, while the numbers to the right of the decimal show how large the part of the whole is.

PLACE VALUE

1	.	6	4	2	3	7	5
Ones	Decimal	Tenths	Hundredths	Thousandths	Ten Thousandths	Hun. Thousandths	Millionths

Part 1   What is the name of the place value for the underlined number?

1) 8.124589	2) 3.___	3) 2.4217	4) 3.64882
5) 2.4335	6) 4.74782	7) ___612	8) 7.926
9) 2.530521	10) 7.754218	11) ___	___9.538142

Part 2   Fill in the place value table for the numbers be___

1) 1.579238

Ones	Decimal	Tenths	Hundredths	Thousandths	Ten Thousandths	Hun. Thousandths	Millionths

2) 2.387219

Ones	Decimal	Tenths	Hundredths	Thousandths	Ten Thousandths	Hun. Thousandths	Millionths

Rounding Decimals

Part 1	Round the decimal numbers below

	Number	Thousandth	Ten Thousandth	Hun. Thousandth
1)	3.141592			
2)	0.1			
3)	9...999			
4)	0.000123			
5)	4.35245			

Part 2	Answer the questions below

1) A scientist is measuring the temperature of a li... a ab. Th... thermometer reads 23.456789 degrees Celsius. Roun... temperature to the nearest ten thousandth degree.

2) The mass of an elephant is 3,700.2985 kilograms. Round this number to the nearest hundred thousandth.

3) A distance runner completes a race in 2 hours, 30 minutes, and 15.12345 seconds. Round the finishing time to the nearest millionth of a second.

Using Decimal Numbers - Operations

Questions   Answer the questions below. Use a calculator if you need to

1) A company has three branches that have sales of $1 354 345.5678, $2 655 245.6789, and $3 495 236.7890. What is the total sales of the company?

Bonus: R_____ _____er to the nearest cent (hundredth).

2) A baker use_____ _____gram_____ _____our to make 24 loaves of bread. How many kilograms of flo_____ _____he bak_____ _____make 48 loaves of bread?

3) A delivery truck travels 345.6789 kil_____ _____s in th_____ _____nd 432.1098 kilometers in the afternoon. What is the total distance traveled_____ _____truc_____ _____day?

4) A machine produces 2 345.6789 units in one hour. How many uni_____ _____produce in 8 hours?

5) A grocery store has a total of $8 555 901.2345 worth of fruits and vegetables in stock. If $2 821 345.6789 worth of vegetables are sold, how much is left in the stock?

Bonus: Round the number to the nearest cent.

Name: _____

Ordering Decimals

Questions | Order the decimal numbers using the letters

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1) Order the following numbers from least to greatest:

a) 0.1234

b) 0.0012

c) 0.123

d) 0.

Answer (ex. a, b, c, d)

_____

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2) Order the following numbers greatest to least:

a) 45.6789

b) 45.789

c) 45.67

d) 45.8901

(ex. a, b, c, d)

---

3) Order the following numbers from least to greatest:

a) 987.654321

b) 98.7654321

c) 9876.54321

d) 9.87654321

Answer (ex. a, b, c, d)

_____

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4) Order the following numbers from greatest to least:

a) 0.000123

b) 0.00123

c) 0.0123

d) 0.123

Answer (ex. a, b, c, d)

_____

Comparing Decimals

Part 1	Compare the decimal numbers using >, <, and =

1) 0.012345 ☐ 0.12345

2) 0.00009 ☐ 0.0001

3) ☐ 12.3456

4) 98.765432 ☐ 98.765431

5) 0.0678 ☐ ...81

6) 9.8765 ☐ 9.8765

7) 123.45678 ☐ 123.45679

8) 000... ☐ 0.000459

Part 2	Answer the questions below

1) A company has two suppliers who offer discounts on bulk purchases. Supplier A offers a discount of 5.6789% and Supplier B offers a discount of 5.689%. Which supplier offers a greater discount?

2) A construction company is building a bridge that needs 1,234.5678 cubic meters of concrete. Two suppliers offer different prices for the concrete. Supplier A offers a price of $89.1234 per cubic meter, while Supplier B offers a price of $89.175 per cubic meter. Which supplier offers a lower price for the required amount of concrete?

Name: _____ 27

Place Value Quiz

Part 1   Fill in the place value chart below

5 231 363 635

B	H M	T M	M	H Th	T Th	Th	H	T	O

Part 2   What place value is the underlined number?

1) 452 132 51_	2 668	3) 4_58 342 658
4) 153 5_14 248	5) 1 65 __4	6) 1_ 412 762 134
7) 3 150 42_7 205	8) 7 852 6_20 500	7 84__ 541

Part 3   Fill in the table below – how many are in the number?

	Number	Billions	Millions	Thousands	Ones
1)	5 218 245 842				
2)	7 610 304 220				
3)	3 497 584 752				

Part 4	What is the standard form of the numbers below?

1) 2 000 000 000 + 100 000 000 + 7 000 000 + 800 000 + 10 000 + 200 + 30 + 5

2) 4 000 000 000 + 500 000 000 + 80 000 000 + 900 000 + 70 000 + 6 000 + 500 + 30 + 2

Part 5	Write the expanded form of the numbers below

1) 2 85_ _ 000

2) 9 128 700 000

Part 6	Write the standard form of the _____n wo_____

1) Six-hundred four million, three hundred seventy-six thousand, two hundred twenty-two	2) Nine_____ _____forty m_____ two-thousand, _____hdr_____ _____n-fi_____

Part 7	Write the written form of the numbers below

1) 87 300 640

2) 500 160 500

3) 352 007 004

Part 8 What is the standard form of the numbers below?

1) 728.1252	2) 63.4212	3) 4 352.4127	4) 13.61288
5) 2.43572	6) 1.73213	7) 24.32646	8) 7.925236

Part 9 are the decimal numbers using >, <, and =

1)

0.012345	☐	0.12345	...09	☐	0.0001

3)

123.456	☐	12.3456

4)

98.76543	☐	...31

Part 10 Order the decimal numbers using the letters

Order the following numbers from least to greatest:

a) 2.5234

b) 2.1012

c) 2.02345

d) 2.523456

Answer (ex. a, b, c, d)

Mental Math - Multiplication - Skip Counting

Directions:
1. Decide which number is easier to count by
2. Count by that number the other number amount of times

$$7 \times 5 = ?$$

1 2 3 4 5 6 7
5, 10, 15, 20, 25, 30, 35

12 x 5	10 x 6
13 x 4	16 x 4
18 x 3	17
14 x 4	15 x 8

Mental Math - Multiplication - Breaking Up Numbers

Directions
1. Break up one of the numbers into friendlier numbers (two-digit number into one)
2. Multiply the other number by the two friendlier numbers
3. Add the two answers together

Example

16×4

$\underline{10} \times 4$ and $\underline{6} \times 4$

40   24

64

	18 x 6
16 x 7	x 3
19 x 6	15 x 8
16 x 6	**17 x 9**

Mental Math - Multiplication - Doubling and Halving

Directions
1. Halve one of the numbers and double the other number (2 options)
2. Multiply the new numbers together

Example

14 x 4

Option 1: 28 x 2 or Option 2: 7 x 8

56   56

14	16 x 6
18 x 6	18 x 4
20 x 8	16 x
14 x 8	18 x 5
19 x 3	17 x 4

Mental Math - Multiplication - Doubling and Halving

Directions
1. Halve one of the numbers to make the equation simpler
2. Solve the equation
3. Double the product (answer)

<u>Example</u>

$$\underline{18 \times 7}$$
$$9 \times 7 = 63$$
$$63 \times 2 = 126$$

3	16 x 10
15 x 8	18 x 8
14 x 9	13 x
19 x 4	14 x 10
14 x 6	17 x 4

Mental Math - Division - Skip Counting

Directions:
1. Count up by the smaller number to the larger number
2. The answer is how many times you counted

$$91 \times 7 = ?$$

1 2 3 4 5 6 7 8 9 10 11 12 13
7, 14, 21, 28, 35, 42, 49, 56, 63, 70, 77, 84, 91

Answer = 13

	$85 \div 5$
$72 \div 4$	$84 \div 6$
$105 \div 5$	10
$112 \div 8$	$114 \div 6$

Mental Math - Division - Splitting Up The Dividend

Directions
1. Break up the larger number (dividend) into friendlier numbers
2. Find out how many times your smaller number (divisor) fits into the new dividends
3. Add up how many times your smaller number fits into your larger numbers

Example

friendlier numbers

$144 \div 6 = 24$

$60 \div 6 = 10$
$60 \div 6 = 10$
$24 \div 6 = 4$

	$68 \div 4$
$150 \div 6$	$\div 5$
$120 \div 4$	$189 \div 7$
$208 \div 8$	$198 \div 6$

Mixed Operations - BEDMAS

When solving an equation, you need to follow the <u>order of operations</u>. 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)

ple 1
$\times 6) = ?$

Example 2
$9 - 3 \div (3 \times 1) = ?$
$9 - 3 \div 3 =$
$9 - 1 = 8$

Questions culat wers to the equations using BEDMAS

1) $3 + (4 \times 5) =$	21 –	3) $(8 \times 4) + (4 \div 2) =$
4) $(12 \div 6) \times 3 =$	5) $12 + (2 + 10)$	$(1 + 3) =$
7) $24 \div 6 + (4 + 10) =$	8) $17 - 2 \times 5 =$	9) $25 + (5 \times 5) =$
10) $25 - 15 \div 5 =$	11) $22 - 6 + 5 =$	12) $18 - 5 + (6 \times 8) =$

Mixed Operations - BEDMAS

Questions | Find out the value of the variables using BEDMAS

1) $1 \times (2 + 8) =$

2) $3 \times (6 - 4) =$

3) $8 \times 4 + (13 + 8) =$

4) $(7 + \quad) \quad 4 =$

5) $9 - 4 + (4 \times 9) =$

6) $5 \times (4 + 5) =$

7) $36 \div (3 + 3) =$

8) $\quad - 8 =$

9) $28 + (9 \div 3) =$

10) $2 \times (28 \div 7) =$

11) $42 + (3 \times \quad$

12) $\quad + 9 \times (2 + 1) =$

Word Problems | Answer the word problems below

1) Lindsay ordered two slices of pizza and soda for lunch. A slice of pizza is $2.50, and a soda is $2.00. Lindsay did the math below. What did she do wrong?

$2.50 + $2.00 x 2 = ?
$4.50 x 2 = $9.00

2) John bought 2 pieces of bubble gum for 20 cents each and 3 chocolate bars for 70 cents each. How many cents did he spend? Write the equation.

Order of Operations - Who's Right?

| Questions | Sophia and Aiden both answered the questions below. Circle who's right |

	Question	Sophia's Answer	Aiden's Answer
1	2 + 6 x 4 + 12	44	38
2	10 – 2 x 3	4	24
3	+ 1)	0	18
4	5 x	19	11
5	12 ÷ 3 x (5 + 5)	5	40
6	20 + (8 – 3) x 2		5
7	10 x 3 – (2 x 5) – 2	22	18
8	25 ÷ 5 + 6 x 3	23	33
9	48 ÷ 6 – (2 + 3)	48	3
10	3 + 6 x 7 + 11 – 6 ÷ 2	53	34

Order of Operations - Candy Shop

Word Problems | Write the equation for the situations below and answer the question

A candy shops sells gum, gummies, and candies. The prices are displayed in the table below.

Candy	Price in Cents
Gum	25
Gummies	5
Candies	10

Example

Miranda bought 2 p____ of b____ ____ gummies, and 5 candies. How many cents did she spend?

____ $\times 2$ ____ $+ (5 \times 10) =$
____ $+$ ____

1) Ava bought 3 pieces of gum, 8 gu____es, and ____ ____. ____ow many cents did she spend?

2) Neil had 100 cents. He bought 5 gummies and 6 cand____ ____ ____ ____es he have left?

3) Dan purchased 4 pieces of gum, 9 gummies, and 3 candies. How many cents did he spend?

4) Claire had 150 cents. She bought 3 pieces of gum, 3 candies, and 6 gummies. How much does she have left?

Order of Operations - Café

Word Problems | Write the equation for the situations below and answer the question

A café sells coffee, donuts, sandwiches, and Frappuccino's. The menu is listed below.

Menu Items	Price in Dollars
Coffee	3
Donut	2
Sandwich	6
Frappuccino	5

1) Ella bough... ...s, 2 do... ...nd 3 sandwiches for her and her friends. How much did she ...?

2) Emily had 10 dollars and then her ...ents ga... ...er a...dditional 10 dollars. She is supposed to spend her money equally ... ...n he... ...rs. How much money do each of the 4 sisters get?

3) Asher had $50 to spend at the café for him and his friends. ...b... ...coffees, 4 donuts, 3 sandwiches, and 3 Frappuccino's. How much money do... ...e have left?

4) Amelia purchased 5 coffees, 5 donuts, and 5 Frappuccino's for her 5 friends. The 5 friends will split the cost. How much will each friend need to pay?

Communitive Property of Multiplication

The **communitive property of multiplication** is that changing the order of factors does not change the product. For example, 4 x 3 = 3 x 4

Questions | Solve the equation and re-write it in different ways. Does the product change?

#	Question	Rewritten	Rewritten
1)			
2)	3 x ___		
3)	5 x 4 x 3 = ___		
4)	1 x 9 x 3 = ___		
5)	6 x 3 x 2 = ___		
6)	4 x 3 x 5 = ___		
7)	7 x 5 x 2 = ___		
8)	9 x 3 x 4 = ___		
9)	10 x 5 x 3 = ___		
10)	8 x 4 x 5 = ___		

Composing a Product in Multiple Ways

1)	Product	100
	25 x 2 x 2	
	10 x 5 x 2	
	~~5 x 4~~	

2)	Product	12

3)	Pr~~oduct~~	

4)	Product	50

5)	Product	18

6)	Product	75

7)	Product	36

8)	Product	24

Composing a Product in Multiple Ways

Questions How many ways can you represent a product? The first one is done for you

1)	Product	60

1 x 3 x 20

x 10 x 3

2)	Product	40

3)	Product	

	Product	30

5)	Product	120

6)	Product	200

Introduction to Multiples

Questions | List the first 5 multiples for each number

	Example
2	2, 4, 6, 8, 10

1)

2) 10

3) 3

4) 4

5) 7

6) 9

7) 6

8) 8

PREVIEW

Introduction to Factors

Questions	List all of the factors for the numbers below

1) 12 _____, _____, _____, _____, _____, _____

2) 25 _____, _____, _____

3) 21 _____, _____, _____, _____

4) 16 _____, _____, _____, _____, _____

5) 43 _____, _____

6) 29 _____, _____

7) 6 _____, _____, _____, _____

8) 10 _____, _____, _____, _____

9) 15 _____, _____, _____, _____

10) 20 _____, _____, _____, _____, _____, _____

Find the Factors

Questions | Circle all the factors of the number listed

1) 10				2) 8			
8	2	9	4	8	2	6	4
3	1	10	5	3	1	7	5

3) 47				4) 18			
23				1	9	6	4
3	47		1	8	2	3	18

5) 22							
22	2	7	3			2	25
11	1	10	6	13			4

7) 24				8) 58			
8	2	4	6	2	30	27	3
3	1	24	12	6	1	29	58

9) 86				10) 63			
2	44	1	52	3	21	2	63
43	3	86	8	9	1	15	7

Prime or Composite Number?

Questions   1) Write the factors 2) Is the number a prime or composite number?

1) 27

Factors: _____

Prime   or   Composite

2) 12

Factors: _____

Prime   or   Composite

3) 7

Factors: _____

Prime   or   Composite

4) 17

Factors: _____

Prime   or   Composite

5) 28

Factors: _____

Prime   or   Composite

6) 41

Factors: _____

Prime   or   Composite

7) 33

Factors: _____

Prime   or   Composite

8) 35

Factors: _____

Prime   or   Composite

9) 73

Factors: _____

Prime   or   Composite

10) 81

Factors: _____

Prime   or   Composite

Finding Prime and Composite Numbers

Part 1 Follow the directions below

1) Circle the prime numbers below

11	15	7	18	3	5
13	19	33	49	52	45
5		67	90	81	74

2) Circle the composite numbers below

6			13	19	25
50	43	1		55	21
47	54	62	7	51	63

Part 2 Write the numbers from the pair to the correct heading

	Pairs of Numbers	Prime	Composite
1)	22, 5		
2)	12, 17		
3)	23, 25		
4)	41, 49		
5)	59, 52		
6)	67, 16		
7)	73, 81		
8)	89, 95		

Prime Number Maze

Questions | Help Brayden get to the park by colouring a prime number path

57	28	91	81	6	39	12	55
12	75	18	91	48	28	42	62
44	11	9?	4	46	60	21	32	95
75	43	51	6?	55	78	24	51	86
96	53	29	17	2?	88	9?	25	44	90
91	92	74	31	60	91	4?	48	50
65	95	46	61	38	97	53	61	?	66
52	34	68	7	57	79	57	55	97	75
82	38	62	5	3	19	68
93	50	60	86	99	90	60

Composite Number Maze

Questions   Help Angela get to school by colouring a composite number path

7	19	29	37	67	71	61	83	
97		51	32	45	46	25	10	
79	92	19	29	97	83	53	43	13
5	50	76	9	7	5	2	11	5
3	7	41	23	7	29	11	41	6	7
74	55	52	92	95	13		67	43	17
98	17	61	41	89	23	59	71	7	59
100	70	39	40	68	65	79	83	29	89
2	19	83	67				61	59	73
11	59	73	59				53	67	61

Prime Factor Trees
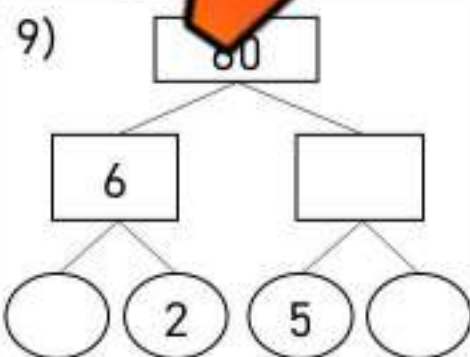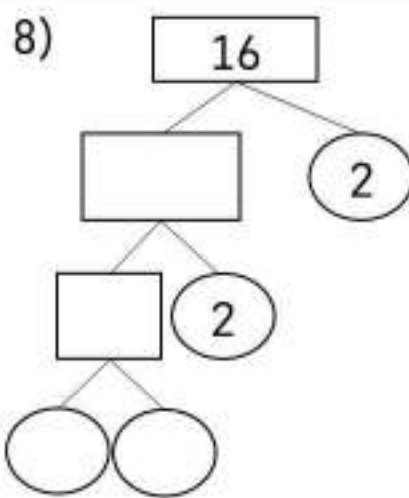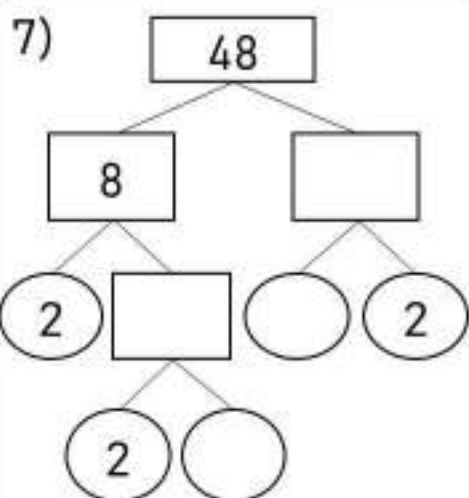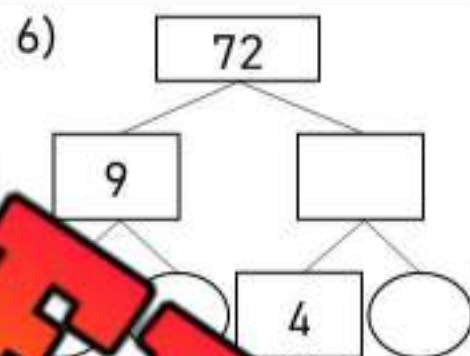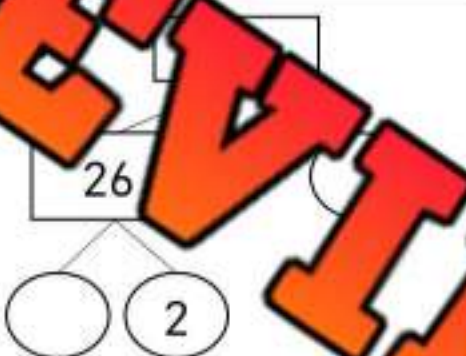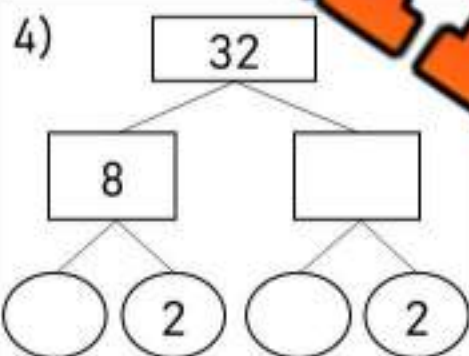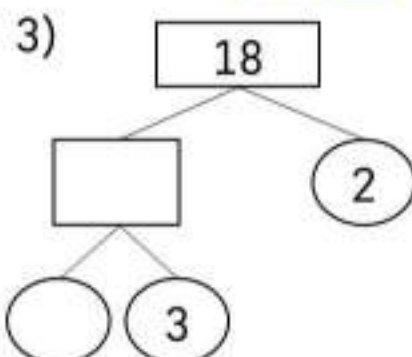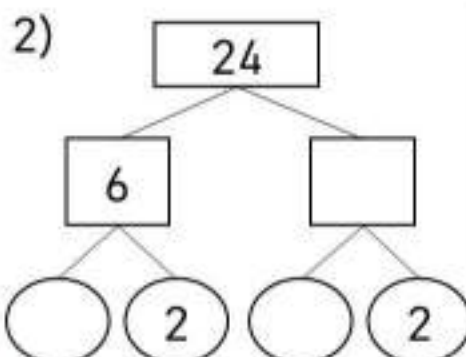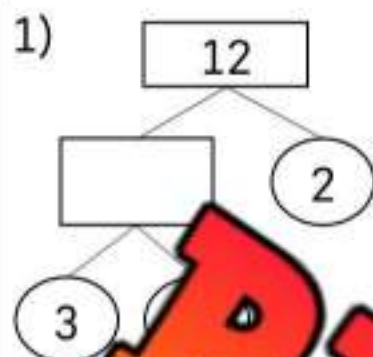
Questions | Fill in the factor trees below

1)
```
        12
       /  \
    [   ]   (2)
    /  \
  (3)  ( )
```

2)
```
        24
       /    \
    [6]      [  ]
    /  \     /  \
 ( ) (2)  ( ) (2)
```

3)
```
        18
       /    \
    [   ]    (2)
    /  \
  ( ) (3)
```

4)
```
        32
       /    \
    [8]      [  ]
    /  \     /  \
 ( ) (2)  ( ) (2)
```

5)
```
    [26]       ( )
    /  \
 ( ) (2)
```

6)
```
        72
       /    \
    [9]      [  ]
    /  \     
 ( )  [4]  ( )
```

7)
```
        48
       /    \
    [8]      [  ]
    /  \     /  \
 (2) [ ] ( ) (2)
      /  \
    (2)  ( )
```

8)
```
        16
       /    \
    [   ]    (2)
    /  \
  [ ] (2)
  /  \
 ( ) ( )
```

9)
```
        80
       /    \
    [6]      [  ]
    /  \     /  \
 ( ) (2) (5) ( )
```

Prime Factor Trees

Questions Fill in the factor trees below

1)

```
      15
     /  \
   (  )  (3)
```

15 = _____ x _____

2)

```
      28
     /  \
   [7]  [  ]
        /  \
      (  ) (2)
```

_____ x _____ x _____

3)

```
      44
     /  \
   [4]  (  )
   /  \
 (  ) (  )
```

44 = _____ x _____ x _____

4)

```
        40
       /  \
    [10]  [  ]
    /  \   /  \
  ( )( ) ( )( )
```

40 = ___ x ___ x ___ x ___

5)

```
      49
     /  \
   [6]  (  )
   /  \
 ( )  ( )
```

49 = _____ x _____ x _____

6)

```
      44
     /  \
   (2)  [  ]
        /  \
      ( )  ( )
```

44 = _____ x _____ x _____

7)

```
      51
     /  \
   (3)  (  )
```

51 = _____ x _____

8)

```
      66
     /  \
   [  ] (2)
   /  \
 ( )  ( )
```

66 = _____ x _____ x _____

9)

```
        60
       /  \
    [6]   [  ]
    /  \   /  \
  ( )( ) ( )( )
```

60 = ___ x ___ x ___ x ___
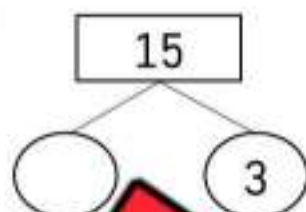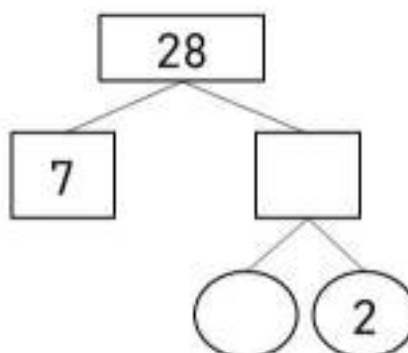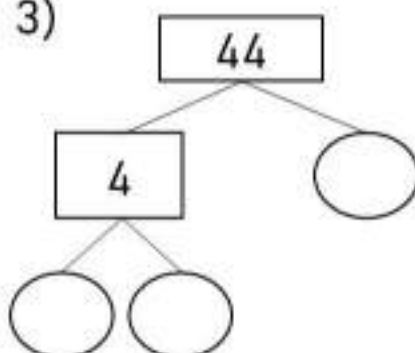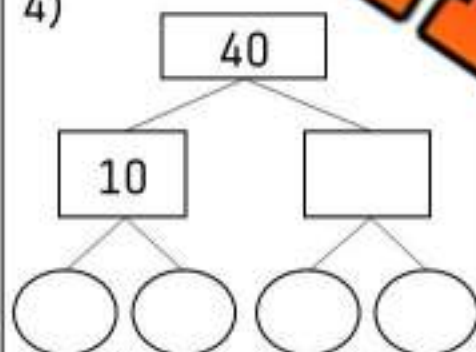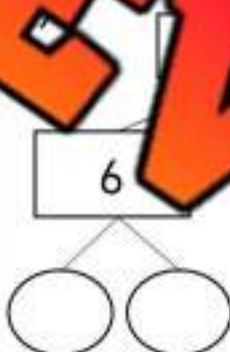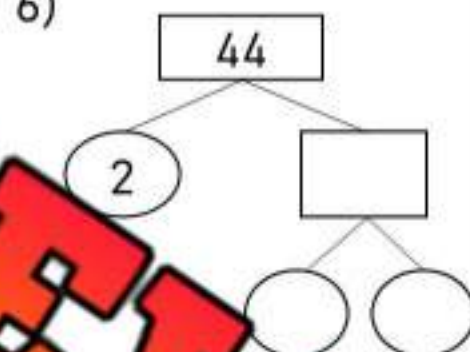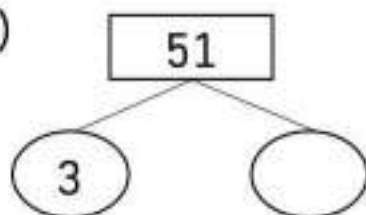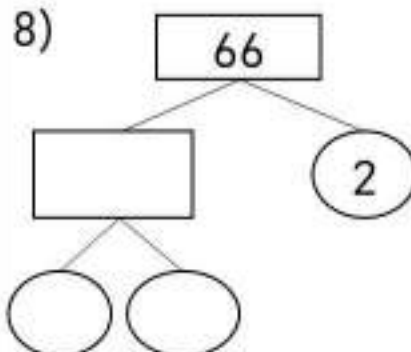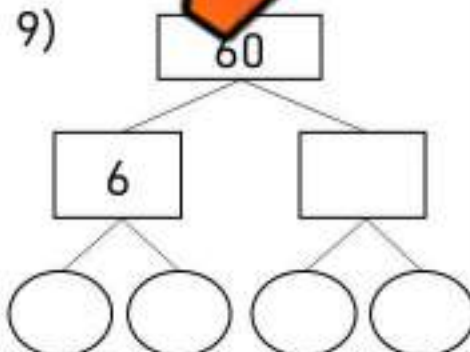
Prime Factor Trees

Questions | Fill in the factor trees differently for the same number

1)
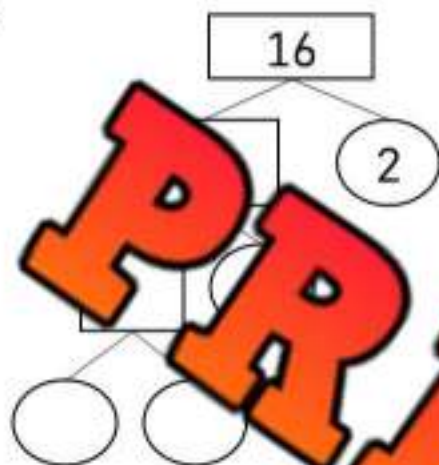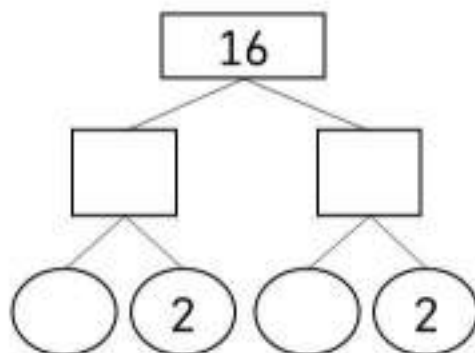
16

2

Equation

2)

16

2 | 2

Equation

3)

36

12

3

2

Equation

4)

6
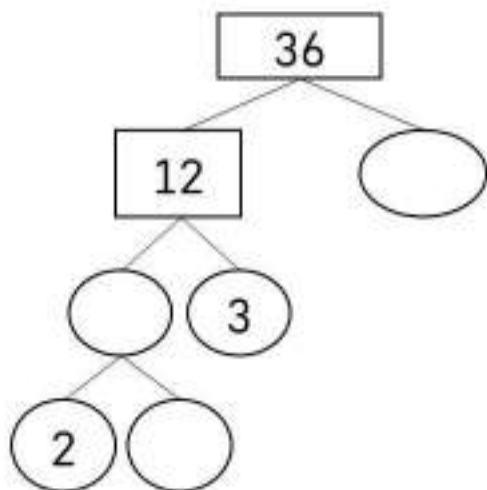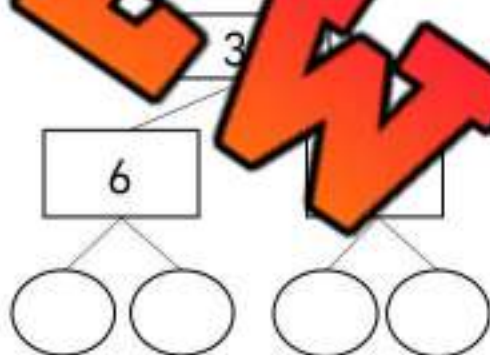
Equation

Prime Factor Trees

Questions | Draw your own factor trees below

1) | 42

2) | 16

3) | 78

4) | 68

5) | 50

6) | 72

PREVIEW

Name: _____

Greatest Common Factor

Questions List the factors and write the greatest common factor (GCF)

1)
12 _____
18 _____

G _____ [ ]

2)
15 _____
25 _____

GCF = [ ]

3)
35 _____
28 _____

GCF = [ ]

4)
16 _____
4 _____

GCF = [ ]

5)
32 _____
48 _____

GCF = [ ]

6)
24 _____
_____

7)
16 _____
48 _____

GCF = [ ]

8)
27 _____
9 _____

GCF = [ ]

9)
54 _____
36 _____

GCF = [ ]

10)
64 _____
56 _____

GCF = [ ]

Greatest Common Factor - Riddle

Questions Find the GCF and match the letter to the numbers above. Notice there are 2 O's, T's and S's! You'll need to decide where to place the letter.

The more you take, the more you leave behind. What am I?

4			12	24	3	15	25	5

S	(15,		(48, 56)	P	(50, 75)
T	(48, 36)	F	(16, 28)		14)
S	(48, 72)	T	(9, 15)	E	(60, 45)

Lowest Common Multiple (LCM)

The lowest common multiple (LCM) is simply the smallest of the common multiples.

Steps:
1) List all the multiples of the set of numbers until you get a match
2) The LCM is the lowest number that fits into all numbers in the set

Example
(3, 10)
3 – 3, 6 ... 5, 18, 21, 24, 27, (30) ...
10 – ...   **Answer – The LCM is 30**

Questions ... ...mon multiple (LCM) of the numbers below

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

Lowest Common Multiple - Riddle

Questions | Write the letters above the answers at the bottom to solve the riddle

U	LCM of 3 and 4		R	LCM of 9 and 21
	LCM of ___ and 3		Y	LCM of 7 and 6
O	LCM of 4 and 10			LCM of 4 and 14
N	LCM of 6 and 8		A	LCM of ___

What belongs to you but is used more by your friends

___ ___ ___ ___   ___ ___ ___ ___
42   20   12   63   24   18   21   28

Front-End Estimation

Front-end estimation is when we keep the first number the same and change the other numbers to 0. This form of estimation always underestimates the number.

Examples 1) 37 → 30   2) 164 → 100   3) 2.35 → 2.00   4) 26.5624 → 26.0000

Part 1	Use front-end estimation to round the 3-digit numbers below

1) 324		6) 212	
2) 6		7) 363	
3) 43		8) 745	
4) 614		9) 913	
5) 962		10) 867	

Part 2	Use front-end estimation to round the 4-digit numbers below

1) 4375		6) 67	
2) 7265		7) 2	
3) 8485		8) 4	
4) 6214		9) 9582	
5) 1971		10) 8485	

Part 3	Use front-end estimation to round to the nearest whole number

1) 4.27		6) 17.9312	
2) 7.1		7) 13.57284	
3) 8.285		8) 24.13214	
4) 6.078		9) 39.64825	
5) 1.512		10) 48.73126	

Front-End Estimation - Multiplication Using Decimals

Questions | Use front-end estimation to round to the nearest whole number

1) Question	5.31 x 5 = ?
Front-End Estimation Version	<u>5 x 5 = 25</u>

2) Question	6.82 x 8 = ?
Front-End Estimation Version	_____ x _____ = _____

3)	8.14 x 3 = ?
Front-End Estimation	_____ x _____ = _____

4) Question	9.14 x 7 = ?
Front-End Estimation Version	= _____

5) Question	
Front-End Estimation Version	

6) Question	18.15 x 3 =
Front-End Estimation Version	_____ x _____ = _____

7) Question	20.21 x 8 = ?
Front-End Estimation Version	_____ x _____ = _____

8) Question	25.54 x 6 = ?
Front-End Estimation Version	_____ x _____ = _____

Front-End Estimation - Multiple Choice

Questions	Which estimate is the best? Use front-end estimate to make your choice

1) 8.34 x 7	2) 5.52 x 5
a) 48	a) 30
b) 56	b) 55
c) 70	c) 25
d) 55	d) 32
3) 6.7	4) 4.25 x 3
a) 48	a) 11
b) 50	b) 15
c) 52	c) 9
d) 55	
5) 7.64 x 7	10.
a) 49	a) 88
b) 52	
c) 59	c) 80
d) 45	d) 78
7) 11.37 x 4	8) 24.54 x 4
a) 48	a) 99
b) 44	b) 96
c) 52	c) 100
d) 40	d) 90
9) 12.84 x 2	10) 21.34 x 3
a) 24	a) 50
b) 28	b) 60
c) 30	c) 68
d) 20	d) 63

Multiplying Decimals - Placing the Decimal

Questions | Use front-end estimation to determine where to put the decimal

1) 7.334 x 7	2) 3.152 x 5
a) 513.38	a) 157.6
b) 51.338	b) 1.576
c) 5.1338	c) 15.76
d) 5133.8	d) 0.1576
3) 6.?	4) 5.31 x 3
a) 53.936	a) 159.3
b) 5.3936	b) 1593.0
c) 539.36	c) 1.593
d) 5393.6	d) ?93
5) 9.422 x 7	6.3?
a) 65.954	a) 5?
b) 6.5954	?2
c) 659.54	c) 50.8?
d) 6595.4	d) 5059.2
7) 9.325 x 4	8) 4.627 x 4
a) 37.3	a) 185.08
b) 3.73	b) 18.508
c) 0.373	c) 1850.8
d) 373.0	d) 1.8508
9) 11.624 x 2	10) 10.334 x 3
a) 232.48	a) 310.02
b) 23.248	b) 3.1002
c) 2.3248	c) 3100.2
d) 2324.8	d) 31.002

Front-End Estimation - Multiplication Using Decimals

Questions	Use front-end estimate to estimate the answers

1) Jen earns $22.53 each time she washes a car. She washed 6 cars today. Approximately how much money did she earn?

2) Be____ck____his driveway. Each brick is 12.23cm long. Approximately how t___re all t___ if he puts them together?
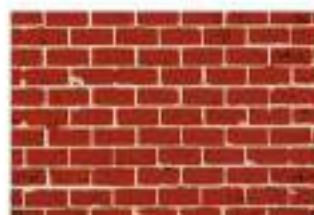
3) Steve ran a route around hi___eigh___days straight. His route is 11.25km. Approximately how many k___teve___he 7 days?

4) Julia worked 7 hours yesterday and made $18.55 per hour. A___w much money did she earn yesterday?

5) Henry bought 4 bags of soil. Each bag weighs 18.75kg. Approximately how much did all the bags weigh in total?

Multiplication - 2 x 2 Digits

Questions | Use the standard algorithm to solve the multiplication problems below

63	35	55	29	68
x 42	x 73	x 10	x 65	x 40

	26	88	25
x 74	x 64	x 23	x 41

66	92	29		78
x 22	x 81	x 35		x 53

Part 2 | Solve the word problems below

1) A brick layer is building a brick retaining wall. They are using 34 rows of bricks that are 42 bricks tall. How many bricks do they need?
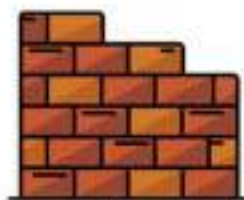
2) A football arena has 58 rows and 74 columns of seating. How many seats does the arena have in total?

Multiplication - 2 x 2 Digits

Step 1: Setup up the Area Model

32 x 17= _____

	30	2
10		
7		

Step 2: Multiply

32 x 17= _____

	30	2
10	30 x 10 **300**	10 x 2 **20**
7	30 x 7 **210**	7 x 2 **14**

Step 3: Add

32 x 17= 544

	30	2
10	300	20
7	210	14

300 + 210 + 20 + 14 = 544

Question — the area model to solve the multiplication problems below

1) 32 x 1

2) 27 x 23 = _____

3) 45 x 24 = _____

4)

5) 82 x 44 = _____

6) 94 x 72 = _____

Multiplication - 1-Digit Multiplier

Questions | Use the standard algorithm to solve the multiplication problems below

1)

	1	5		2	5
x					

2)

		7	.	3	7
x					3

3)

	2	1	.	4	8
x					5

4)

	1	8	.	3	8
x					4

6)

	3	4	.	8	4
x					6

7)

	2	7	.	4	8
x					3

8)

	4	2	.	6	8
x					8

9)

	5	2	.	5	1
x					9

Multiplication - 1-Digit Multiplier

Questions | Use the standard algorithm to solve the multiplication problems below

1) 4.13 × 2	2) 7.57 × 5	3) 2.17 × 3	4) 3.41 × 6	5) 5.83 × 4
6) 4.78 × 5		36	9) 3.78 × 1	10) 7.43 × 7
11) 97.8 × 2	12) 85.6 × 1	13) 73.9 × 9	0 × 3	71.5 4
16) 5.23 × 2	17) 63.6 × 1	18) 91.4 × 9	19) 7.24 × 3	20) 80.5 × 4

PREVIEW

Multiplication - 1-Digit Multipliers - Wages

Questions | Solve the word problems below

Four friends work at a farm in the summer. They each earn different wages because they have difference job experience. The wages they earn and the hours they worked yesterday are listed below.

Frien_	Ava	Mia	Charlotte	Emma
Wa___	12.35	15.75	13.40	17.65
		7	8	6
Earnings				

a) Who made the m____ ____ ____ How much did each friend earn? Fill in the table above

b) How much did all 4 friends earn combined?

Multiplication Word Problems

Questions | Solve the word problems below

1) Brian bought his four children each a new backpack for school. Each backpack was $28.55. How much did he spend on the backpacks?

2) Jade bought _____ for each player on her soccer team. The hot dogs cost $2._____ and _____ were 9 soccer players. How much did she spend on hot dog_____

3) Bella's dog is having a birthday soon. _____ a b_____ 7 dog toys that cost $5.65 each. How much did she spen_____ dog toy_____

4) Gavin has been paying for a video game subscription for the last 9 months. Each month costs him $19.99. How much has he spent?

Division - Bar Model

Questions | Use the bar model to answer the division questions below

1) $48 \div 8$

48

2) $36 \div 4$

36

3)

4) $80 \div 10$

80

5) $24 \div 4$

24

6) $30 \div 5$

7) $42 \div 7$

42

8) 72

72

9) $49 \div 7$

49

10) $48 \div 4$

48

Division - Area Model

| Questions | Use the area model to answer the division questions below |

1) 243 ÷ 6 = 40r3 (16+4)

	33	**7**	**0**
6	200 19	40 42	3 r3

2) 284 ÷ 4

4	200	80	4

3) 513 ÷ 2

2	500	10	3

4) 428 ÷ 6

6		20	8

5) 636 ÷ 6

6	600	30	6

6) 778 ÷ 5

5	700	70	8

Dividing Decimals - Removing Decimal

When dividing a decimal, we can remove the decimal and treat it as a whole number. We can do this as long as we add the decimal at the end.

Steps:
1) Remove the decimal
2) Calculate how many times the smaller number (divisor) fits into the dividend
3) Use front-end estimation to determine an estimated answer and add the decimal back to your final answer

Question	Follow the steps above to calculate the answer
1)	$3.30 \div 2 = ?$
2	$330 \div 2 = 165$
S	$3.00 \div 2 = 1.5$ so therefore, put the decimal between the 1 and 6
Answer	1.65

2) Question	$3.24 \div 2 = ?$
Step 1 and 2	
Step 3	
Answer	

3) Question	$4.24 \div ? = ?$
Step 1 and 2	
Step 3	
Answer	

4) Question	$3.39 \div 3 = ?$
Step 1 and 2	
Step 3	
Answer	

Front-End Estimation - Multiple Choice

Questions | Which estimate is the best? Use front-end estimate to make your choice

1) 21.25 ÷ 7	2) 25.32 ÷ 5
a) 4	a) 5
b) 3	b) 4
c) 6	c) 6
d) 5	d) 7

3) 64	4) 27.55 ÷ 3
a) 7	a) 7
b) 9	b) 8
c) 8	c) 9
d) 6	

5) 49.64 ÷ 7	
a) 8	a) 6
b) 6	
c) 7	c) 5
d) 9	d) 4

7) 44.85 ÷ 4	8) 50.92 ÷ 5
a) 10	a) 10
b) 11	b) 9
c) 12	c) 11
d) 9	d) 12

9) 26.42 ÷ 2	10) 24.73 ÷ 3
a) 11	a) 8
b) 12	b) 6
c) 13	c) 7
d) 14	d) 9

Multiplying Decimals - Placing the Decimal

Questions | Which estimate is the best? Use front-end estimate to make your choice

1) 35.34 ÷ 7	2) 30.152 ÷ 5
a) 5.048	a) 603.04
b) 504.8	b) 60.304
c) 5048.0	c) 6030.4
d) 50.48	d) 6.0304
3) 48.	4) 21.531 ÷ 3
a) 60.64	a) 0.7177
b) 6.064	b) 717.7
c) 606.4	c) 7.177
d) 6064.0	.77
5) 42.422 ÷ 7	8
a) 6060.0	a) 90
b) 606.0	05
c) 6.060	c) 9
d) 60.60	d) 9.0905
7) 32.825 ÷ 4	8) 36.627 ÷ 6
a) 8206.0	a) 6104.5
b) 8.206	b) 610.45
c) 820.6	c) 6.1045
d) 82.06	d) 61.045
9) 14.124 ÷ 2	10) 24.844 ÷ 3
a) 7.062	a) 8281.3
b) 70.62	b) 8.2813
c) 706.2	c) 828.13
d) 7062.0	d) 82.813

Front-End Estimation - Dividing Using Decimals

Questions	Use front-end estimate to estimate the answers

1) Rebecca paid Jrue $96.42 after he worked 8 hours. Approximately how many dollars did Rebecca pay Jrue per hour?

2) Co_____ ___ 6 bags of chips. Approximately how much did each bag of chi___ ___t?

3) Chris earned $88.34 after w__king _____ __ _y. How much did he earn per hour?

4) Mark spent $77.82 on 7 hockey cards. On average, approxim___ dollars did each card cost?

5) The Johnson family spent $330.56 on a hotel room for 3 nights. Approximately how much did the hotel cost per night?

Dividing Decimals by Whole Numbers

Part 1	Fill in the table by dividing the decimals by whole numbers

	Number	÷ 2	÷ 4	÷ 10
1)	0.8	0.4	0.2	0.08
2)	0.4			
3)				
4)				
5)	0.9			

Part 2	Fill in the table by dividing the decimals by whole numbers

	Number		÷ 4	÷ 10
1)	0.28	0.14		0.028
2)	0.44			
3)	0.68			
4)	0.84			
5)	0.92			

Part 3	Fill in the table by dividing the decimals by whole numbers

	Number	÷ 2	÷ 4	÷ 10
1)	.116	0.058	0.029	.012 or .0116
2)	.160			
3)	.220			
4)	.348			
5)	.524			

Dividing Decimals by Whole Numbers

Questions | Use the area model to answer the division questions below. #1 is done for you

1) 0.844 ÷ 4

0.844 is really 844 thousandths

4	800	40	4
	200	10	1

Therefore, 0.844 ÷ 4 equals 211 thousandths or 0.211

2) 0.224 ÷ 2

2	200	20	4

3) 0.363 ÷ 3

3	300	60	3

0.396 ÷ 4

4	00	90	6

5) 0.455 ÷ 5

5	400	50	5

6) 0.488 ÷ 8

8	400	80	8

Division – Decimal Word Problems

Questions | Solve the word problems below

1) Tim bought 4 of the same candies for $4.16. How much did each candy cost?

2) Shannon ~~bought 4 raffle~~ tickets for $6.20. How much was each ticket?

3) Leah bought 3 coffees for her friends ~~at work~~ ~~cost her~~ $9.39. How much money did each coffee cost?

4) Sam paid $6.84 for 3 ice cream treats. How much did each treat cost?

Name: _____

Unit Test - Factors and Operations

Part 1	Which estimate is the best? Use front-end estimate to make your choice

1) 6.34 x 7	2) 7.26 x 5
a) 42	a) 40
b) 49	b) 30
c) 50	c) 35
d) 47	d) 38
3) 9.4▢	4) 27.21 ÷ 3
a) 50	a) 7
b) 62	b) 8
c) 54	
d) 64	
5) 24.25 ÷ 3	6) 30
a) 5	
b) 7	b)
c) 8	c) 6
d) 4	d) 7

Part 2	Use the standard algorithm to solve the multiplication problems below

1)

		7	.	2	5
x					2

2)

		5	.	6	3
x					5

3)

	1	5	.	4	6
x					6

Part 3 | Solve the word problems below

1) Carter bought 6 bags of chips for a camping trip. Each bag cost him $3.39. How much did he spend on chips?

2) Li___ ___0 ___inks for her and her friends. How much did each drink cost?

3) A car drives 1.5 kilometres per minute. If t___ ___drive___ ___minutes, how many kilometres will it travel?

4) Maria has 2.5 kilograms of tomatoes. She wants to divide them equally into 5 bags. How many kilograms of tomatoes will each bag have?

Part 4 | Follow the directions below

1) Circle the prime numbers below

90	55	49	18	81	5
74	19	33	7	52	45
15	59	67	11	3	13

2) Circle the composite numbers below

	54	13	62	75
	41	51	55	21
12		25	51	43

Part 5 | List all the factors for the numbers below

1) 12 _____, _____, _____, _____

2) 25 _____, _____, _____

Part 6 | Fill in the factor trees below

1)
```
      32
     /   \
   8       [ ]
  / \     / \
 ( ) (2) ( ) (2)
```

2)
```
      56
     /   \
   28     ( )
  / \
 ( ) (2)
```

3)
```
        72
       /    \
     9       [ ]
    / \     /   \
  ( ) ( )  4     ( )
          / \
        (2) ( )
```
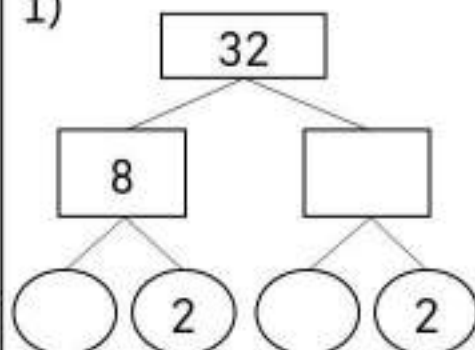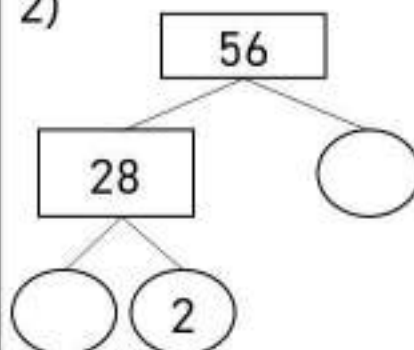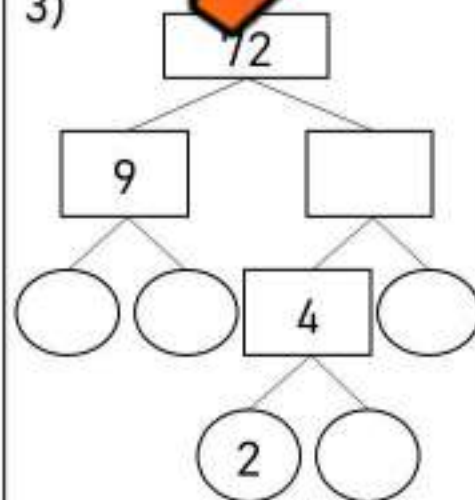
Part 7   Use BEDMAS to solve the questions below

1) $2 \times (2 + 4) =$	2) $5 + (6 - 4) =$	3) $3 \times 4 + (12 + 8) =$
4) $(7 + \; \; \; \; 4 =$	5) $9 - 4 + 4 \times 9 =$	6) $5 + 4 \div 2 \times 5 =$

Part 8   Write the equations f   ms below and then solve

1) A pizza has 8 slices, and 3 people each ea   es. H   slices are left?

2) A book has 200 pages, and the first chapter is 50 pages long. If each chapter after is 30 pages long, how many chapters are in the rest of the book?

b) How many chapters in total are in the book?

Fractions, Decimals, and Percents

| Part 1 | Fill in the table with the converted decimal, fraction, and percent |

Fraction	Decimal	Percent
100/1000		10.0%
2 000		20.0%
	0.300	%
400/1		40.0%
500/1000		%
		60.0%
	00	%
	0.80	%
900/1000		%
	1.000	

| Part 2 | Convert the following fractions, decimals and percents |

138/1000 = %	536/1000 = 0.	42.4% = /1000	798/1000 = %
56.2% = /1000	161/1000 = %	871/1000 = 0.	0.938 = %
0.356 = %	0.682 = %	71.4% = 0.	782/1000 = 0.

Fractions, Decimals, and Percents

Part 1   What fraction, decimal and percent of the array is shaded in?
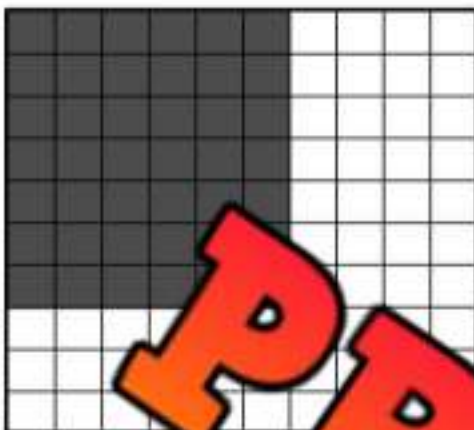
Fraction	Decimal	Percent
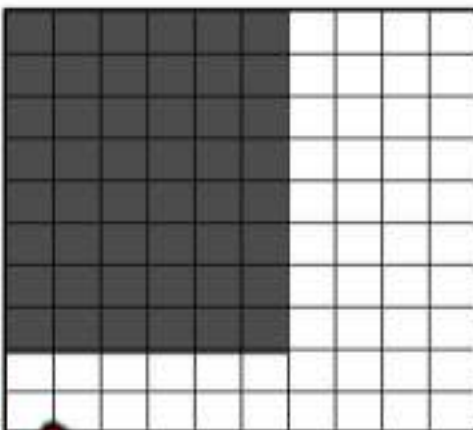
Fraction	Decimal	Percent
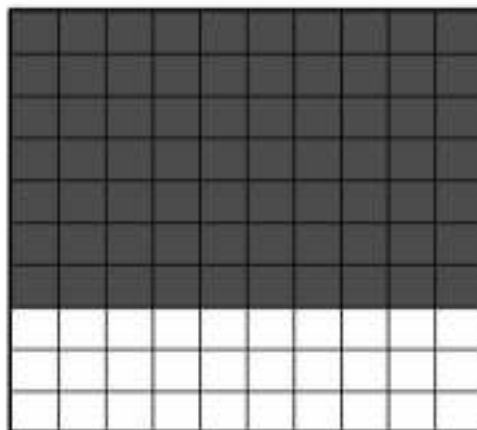
Fraction	Decimal	Percent
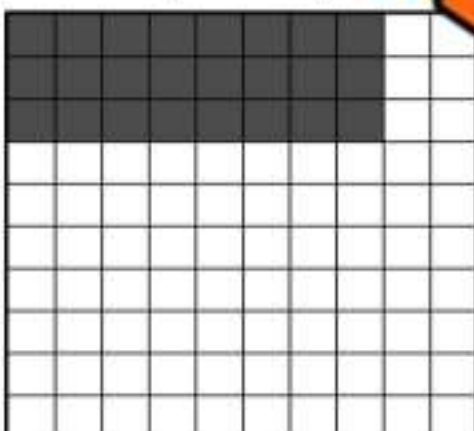
Fraction	Decimal	Percent
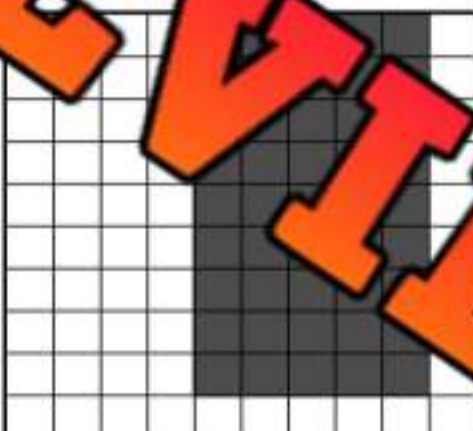
Fraction	Decimal	Percent

Fraction	Decimal	Percent

Part 2   Answer the word problems below

1) Hank got 71 out of 100 on his math test. What percent did he get on his test?

2) Wendy scored 23 out of 50 of her three point shots. What was her three point percentage?

115

Fractions, Decimals, and Percents

Questions	What fraction, decimal and percent of the array is shaded in?
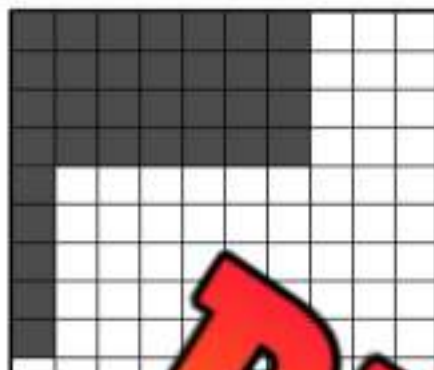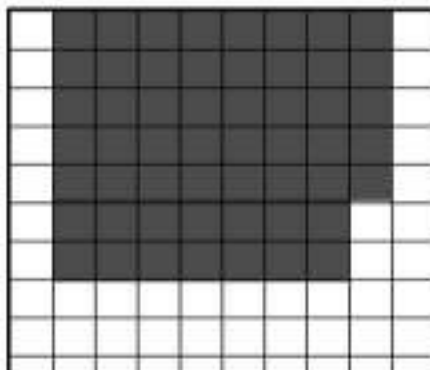
Fraction	
Decimal	
Percent	

Fraction	
Decimal	
Percent	
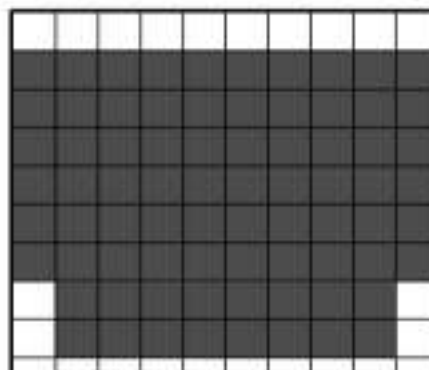
Fraction	
Decimal	
Percent	

Fraction	
Decimal	
Percent	

Fraction	
Decimal	
Percent	
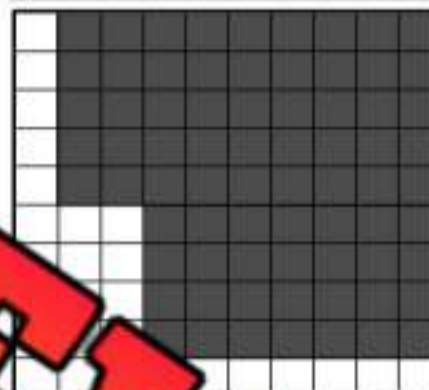
Fraction	
Decimal	
Percent	
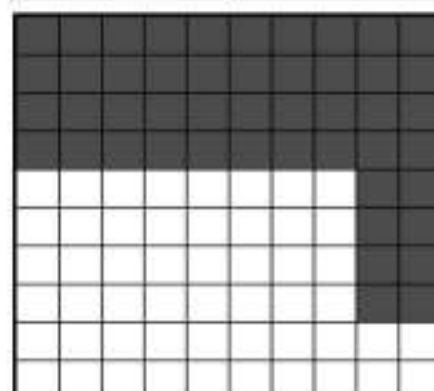
Fraction	
Decimal	
Percent	
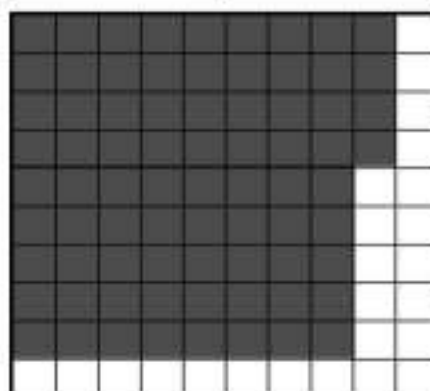
Fraction	
Decimal	
Percent	
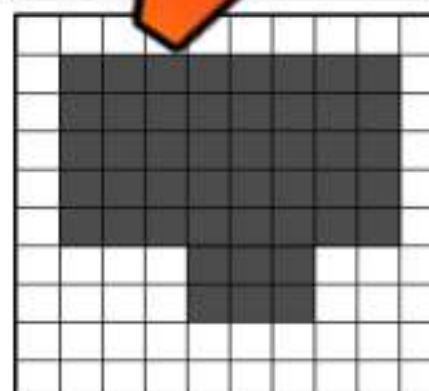
Fraction	
Decimal	
Percent	

Sport Statistics - Fractions, Decimals, and Percents

Part 1 Baseball statistics – What are these player's percentages from the 2020 season

1) Mike Trout had 200 at bats in 2020. He had 56/200 hits, 41/200 runs, and 17/200 home runs. This means for every 200 at bats, he would have 56 hits, 41 runs, and 17 home runs.

	Hits	Runs	Home Runs
Totals – Fraction	56/200	41/200	17/200
Decimal to thousandths			

a) If T____ had 100 a____ _____ many home runs would he have? _____

2) Mookie Betts ___ 3__ bats __ __ He had 98/300 hits, 58/300 runs, and 27/300 home runs. This means for ___ y 300 ___ ___ ___ould have 98 hits, 58 runs, and 27 home runs.

	Hits	Runs	Home Runs
Totals – Fraction	8/3__	58/300	27/300
Decimal to thousandths			
Percent			

a) If Betts had 100 at bats, how many hits would ___ ___

Part 2 Basketball Statistics – Lebron James Sho____ Per___

Lebron James and the LA Lakers won a Championship title in 20__. H__ __ __his shooting percentages by filling in the table below.

	2 pointers	3 pointers
Fraction	214/382	44/119
Decimal to thousandths		
Percent		

a) If James had taken only 100 3 pointers, how many would he have made? _____

b) If James had taken 300 3 pointers, how many would he have made? _____

c) The average NBA player shoots 46% from 2 pointers. How much better is Lebron? _____%

Decimal & Percent - Number Line

Questions	Write the decimal above the percent

1) 0%   33.3%   66.7%   100%

2) 20%   40%   60%   80%   100%

3) 0%   [17%]   50%   66.7%   83.3%   100%

4) 0%   10%   20%   30%   50%   80%   90%   100%

5) 0%   12.5%   25%   37.5%   50%   62.5%   75%   100%

6) 0%   25%   50%   75%   100%

7) 0%   14.3%   28.6%   42.9%   57.1%   74.1%   85.7%   100%

8) 0%   11.1%   22.2%   33.3%   44.4%   55.5%   66.6%   77.7%   88.8%   100%
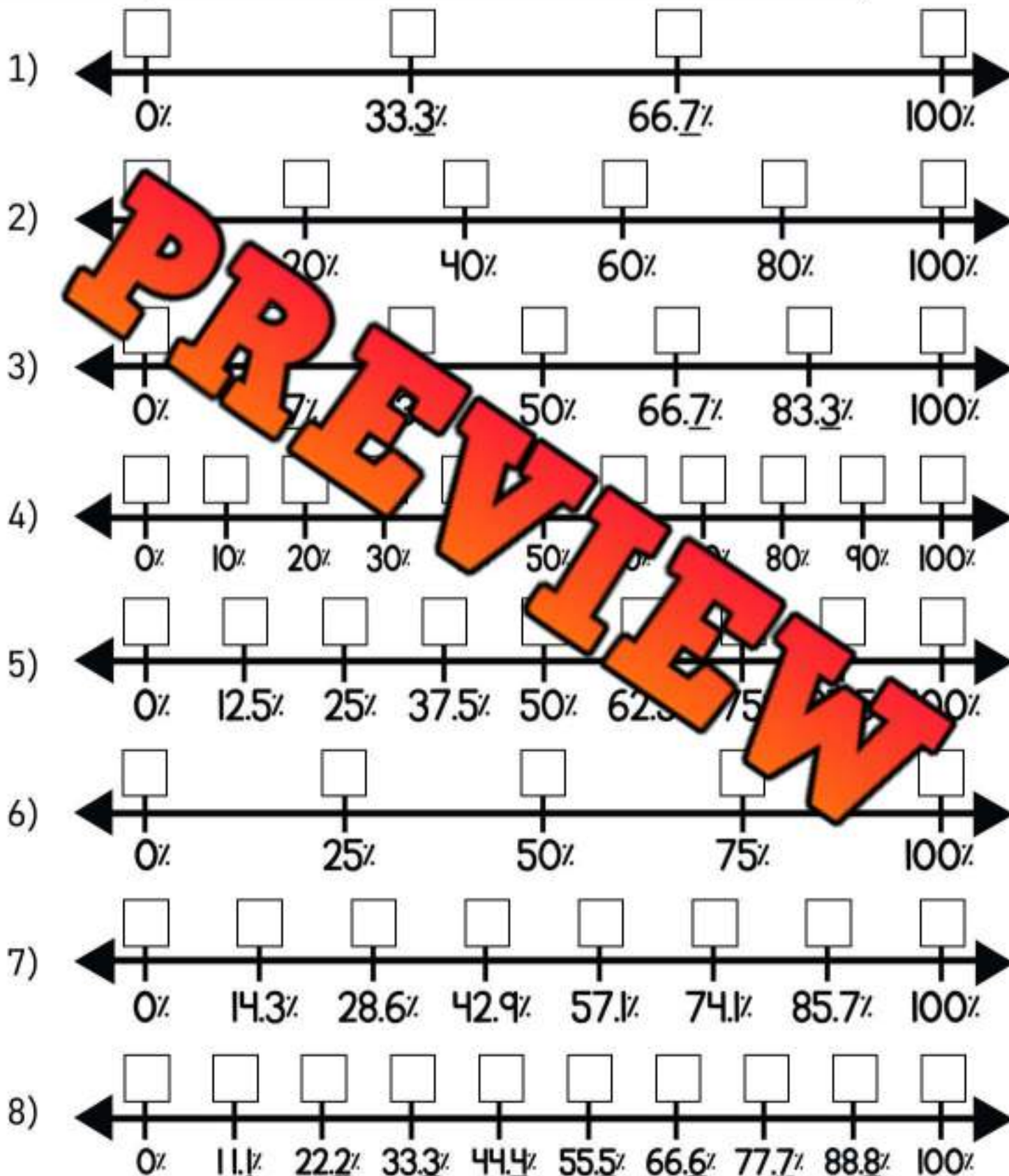
Fraction & Percent - Number Line

Questions | Write the fraction above the percent

1) 0% 25% 50% 75% 100%

2) 0% 33.3% 50% 66.7% 83.3% 100%

3) 0% 14.3% ___ ___ 7.1% 74.1% 85.7% 100%

4) 0% 33.3% 100%

5) 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

6) 0% 20% 40% 60% 80% 100%

7) 0% 12.5% 25% 37.5% 50% 62.5% 75% 87.5% 100%
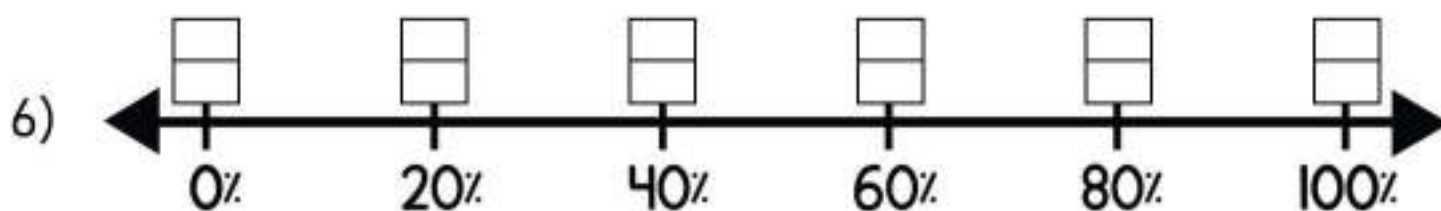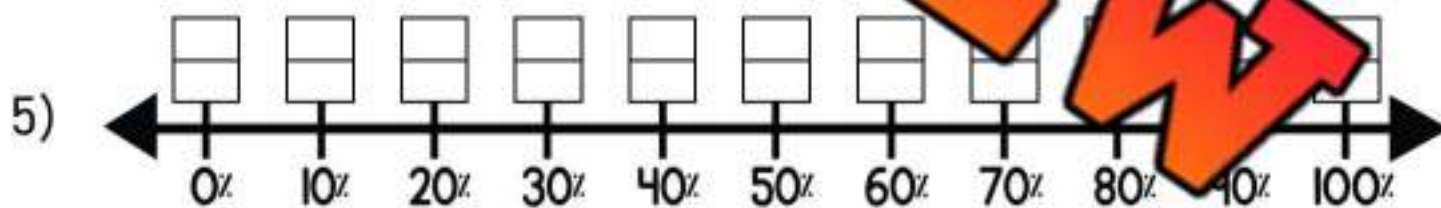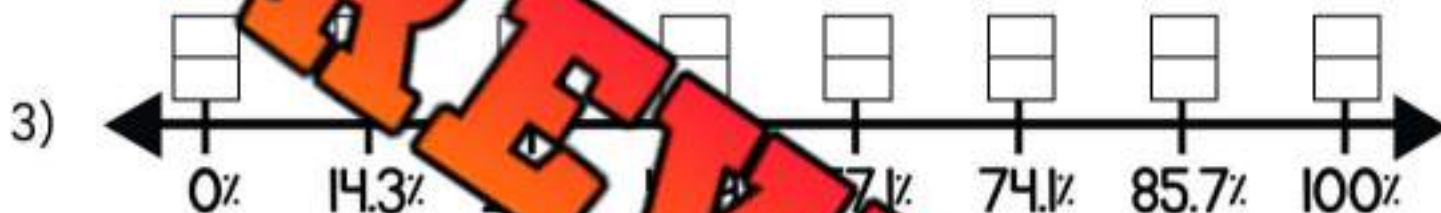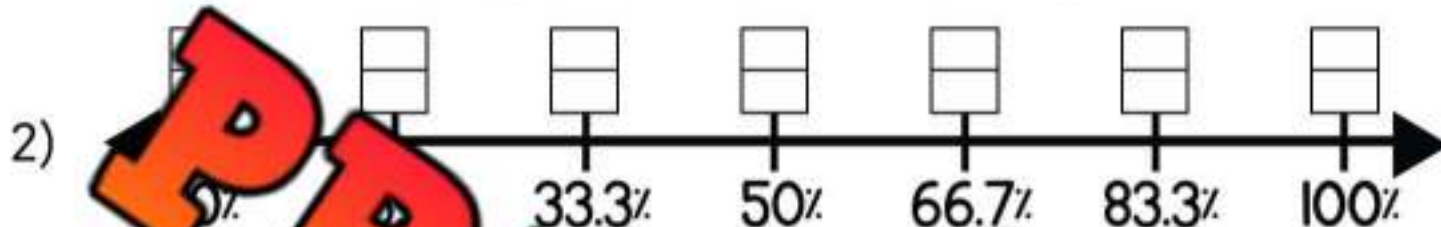
Mental Math - Multiplying by 0.1 and 0.01

Directions:

1. When multiplying by 0.1, it is the same as dividing by 10. Therefore, you can shift the digit to the right by one place.
   <u>For example</u> – 500 x 0.1 = 50 and 50 x 0.1 = 5

2. When multiplying by 0.01, it is the same as dividing by 100. Therefore, you can shift the digit to the right by two places.
   <u>For example</u> – 500 x 0.01 = 5 and 50 x 0.01 = 0.5

x	x 0.01
	100 x 0.01 = _____
100 x 0.1	300 x 0.01 = _____
5 x 0.1 = _____	500 x 0.01 = _____
50 x 0.1 = _____	= _____
500 x 0.1 = _____	0
20 x 0.1 = _____	100 x 0.01 _____
200 x 0.1 = _____	1000 x 0.01 = _____
8 x 0.1 = _____	160 x 0.01 = _____
80 x 0.1 = _____	1600 x 0.01 = _____
800 x 0.1 = _____	5000 x 0.01 = _____

Mental Math - Calculating Percentages - 10% and 15%

Percents represent a rate out of 100 in relation to a whole. Therefore, we can represent 10% as 0.10 and 15% as 0.15.

<u>Hint – To mentally calculate 15%...</u>
1. Determine 10% of the number
2. Find half of answer (5%)
3. Add the 5% to the 10%

<u>Example</u>
1. 210 x ___ 21.0
2. Half ___ 5
3. 2___ ___
4. ___re, 15___ 31.5

SPECIAL OFFER

70% OFF

Questions ___ the ___ low

	Number		0.05 (Half)	15%
1)	100		5	15
2)	200			
3)	400			
4)	500			
5)	120			
6)	180			
7)	240			
8)	310			
9)	450			
10)	680			

Mental Math - Calculating Percentages - 25% and 50%

Percents represent a rate out of 100 in relation to a whole. 50% represents half of a number and 25% is a quarter of a number.

Steps – Calculating 50%...
1. Find half of the number

Example – 50% of 148
1. Divide the number 148 in half (148 ÷ ~~~74)
2. 50% o~~~ 74

Steps – Calculating 25%
1. Find out what 50% of the number is by halving the number
2. Halve the number one more time

Example – 25% of 188
1. 188 ÷ 2 = 94
2. 94 ÷ 2 = 47

Part ~~~ W~~~ half of the numbers below?

1)	24	_____		~~8	_____	3)	76	_____
4)	128	_____		15~~	_____	6)	212	_____
7)	264	_____	8)	3~~		9)	410	_____
10)	550		11)	636			844	_____

Part 2 Fill in the table below

	Number	50%	25%
1)	100		
2)	200		
3)	240		
4)	164		
5)	188		
6)	264		

	Number		~~5%
7)	348		
8)	414		
9)	560		
10)	644		
11)	828		
12)	940		

Mental Math - Calculating Percentages - Visuals

When we want to find the percent of a number, scaling up and down is the best way.

For example, a shirt costs $80 at regular price. To calculate a sale price, we can scale 10% up and down. First, 10% of 80 is 8 which means 20% is 16 and 30% is 24.

$$\$80$$

10%
$8
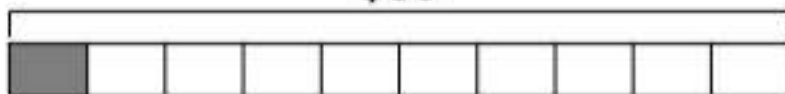
Practice solving the problems below

1) Tom is shopping for new shoes. He finds a pair he likes for $70.00 that are on sale for 15% off. How much will the pair cost before tax?

2) Lindsay is out shopping for a new winter coat. Her mom finds one for $90.00 plus an additional 20% off. How much will the coat cost before tax?

3) Joe brings $100 to the mall to buy some new speakers. He finds some for $78.00 with an additional 35% off.

a)   How much will the speakers cost before tax?

b)   With tax costing 15%, how much will the speakers cost?

c)   How much of the $100 will Joe have when he leaves the mall?

Word Problems - Missing Percentages

Questions | What percentage is missing?

1) In a class, 63% of students take a bus to school and 14% get a drive from their parents. What percentage of students walk to school?

2) In a stu____ ade 7 students, 23% thought math was fun and 42% thought math was just ____ ____ ercentage of students disliked math?

3) A shop sells ____ rs of ____ ey tracked their sales last week and found out that 38% of the don ____ ey ____ ____ olate, and 21% were vanilla. What percentage of the donut ____ eanut ____

4) In a candy survey, respondents we ____ ked wh ____ was their favourite. They could choose from 4 different options – gum, b ____ andy ____ rs, or gummies. 18% chose gum, 27% chose hard candies, an ____ chos ____ ____ hat percentage chose gummies?

5) The Saskatchewan Ministry of Transportation studied ____ h fu ____ ____ st in Saskatchewan. There were 3 options – gas, diesel, or electricity ____ ____ esel and 4% used electricity. What percentage of vehicles use gas?

6) A zoo has monkeys, zebras, pandas, and snakes. Of all the animals, 23% are monkeys, 29% are zebras, and 26% are pandas. What percentage of the animals are snakes?

7) Zoe spends 3 hours on 5 social media apps each day. She spends 28% of the 3 hours on Instagram, 15% on Facebook, 22% on TikTok, and 17% on Snapchat. What percent does she spend on YouTube?

Class List - Decimal, Fraction, Percent

Mrs. Hansen just finished marking a math test. Her class list with the results of the test are below. She has simplified some of the fractions, and some students wrote a different test, meaning they are out of a different total.

Grades
A = 80% and up
B = 70%-79%
C = 60% – 69%
D = 50% – 59%
F = 49% or less

Questions | Fill in the class list ⭐⭐⭐

Student Name	Mark	Decimal	Percent	Grade
Madison	3/4			
Stella				
Matthew	/10			
Eli	7/			
John	1/2			
Kai	1/4			
Ivy	4/4			
Everly	1/5			
Bella	75/100			
Skylar	95/100			
Leah	8/10			
Roman	1/8			
Adrian	1/10			
Easton	4/5			
Savannah	77/100			

Quiz - Decimals, Fractions and Percent

Part 1	What fraction, decimal and percent of the array is shaded in?
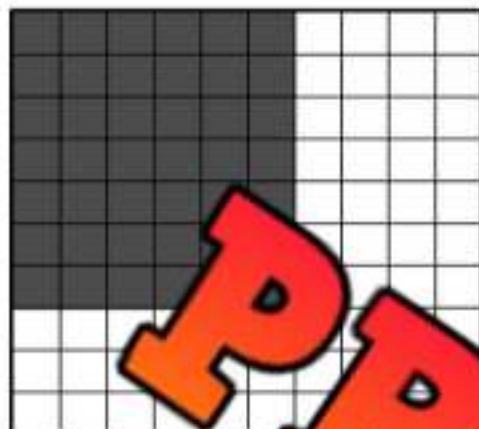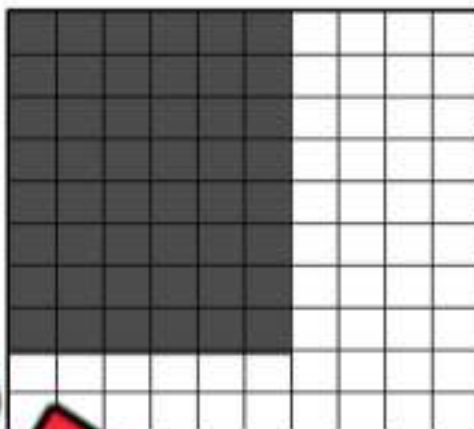
Fraction	Decimal	Percent
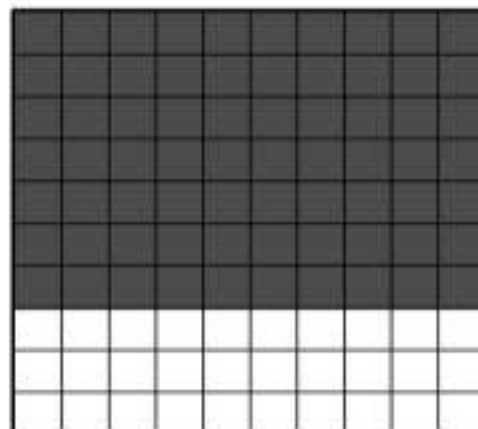
	Decimal	Percent

Fraction	Decimal	Percent

Part 2	Write the decimal above the percent

0%   33.3%   66.%   100%

0%   20%   40%   60%   80%   100%
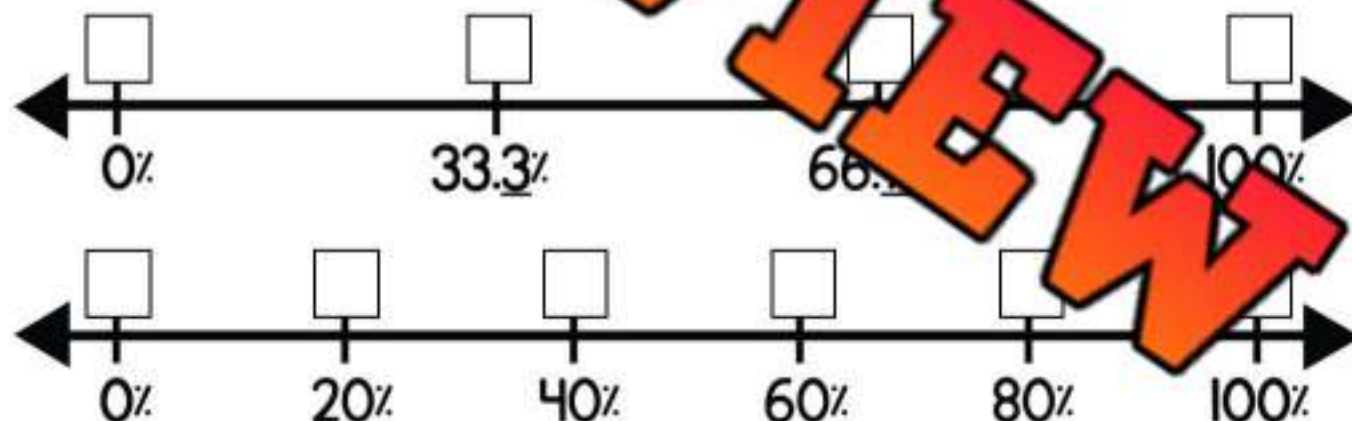
Part 3	Write the fraction above the percent

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
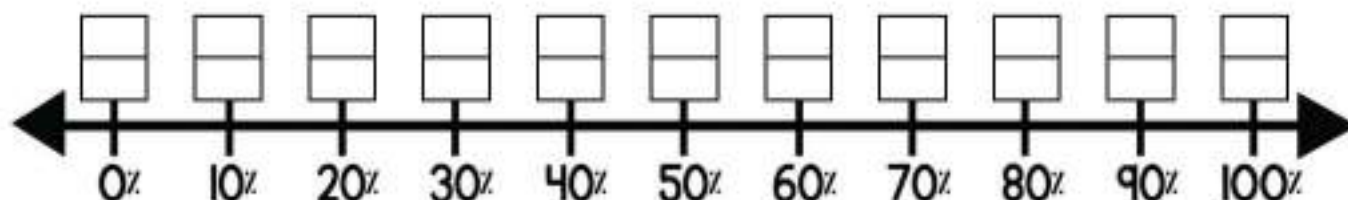
Part 4 | Solve the problem below

4 friends competed in a 3-point shooting contest in basketball. They each took 50 shots. Their results are below.

Valentina	Claire	Dylan	Xavier
12/25	0.439	0.44	43%

a) Who was the best shooter?

b) Rank the friends in order of best shooter to worst shooter.

Part 5 | Answer the word problem

1) The grade 6's voted for their favourite food. There were options and students had to vote for one option. The results are below.

a) What percentage chose pizza?

b) If there were 100 grade 6 students surveyed, how many chose pizza?

	15%
Hamburgers	21%
Ch	18%
Other	22%

2) On a science test, the percentage of grade 6's who scored A, B, C, D, and F is listed below.

a) What percentage of students received an F?

b) If there were 50 students who wrote the test, how many kids got an F?

A	17%
B	38%
C	21%
D	14%
F	

Graphing Integers & Opposite Integers

Part 1   Graph each integer by writing the letter on the number line
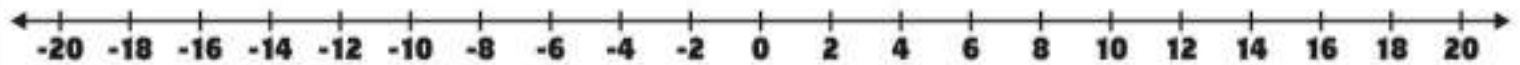
a) 0	e) –18	i) 3	m) –6
b) 6	f) –17	j) 15	n) –7
c) 1█	██ 20	k) –20	o) –10
d) 18	██ 7	L) –3	p) 17

Part 2   Wh██ ██te██ ██ opposite integers?
(hint: an opposite integer ██ ██osit██ ██ negative pair – ex. 3 and –3

1) _____	█ _____
2) _____	6) _____
3) _____	7) _____
4) _____	8) _____

Part 3   Write the opposite integer below

1) 8		4) 14	
2) 12		5) –4	
3) –18		6) –10	

Introduction to Integers

Integers are whole numbers that can be positive, negative or zero. Integers do not include fractions or decimals. We use positive integers a lot, but we sometime need to use negative integers, like when we are measuring the temperature outside in the winter.

Questions | Use the number lines to solve the questions

1) The temperature at 6am was –8°C. At noon, the temperature was 2°C. Circle the temperature on the number line. How much did the temperature rise?
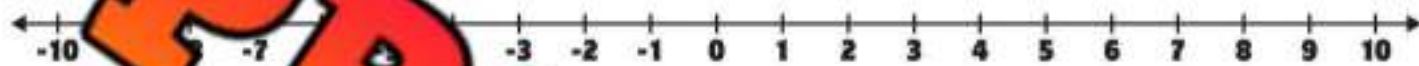
Rise in temperature = _____

2) Steve was in debt to his brother. He had –$10. He was able to make some money by cutting his neighbour's grass. Now he has paid his brother back and has $8 left. How much did he make cutting?

Earnings from cutting grass = $_____

3) A running back in football earned –7 yards in the first half of the game. He ended the game with 9 yards. How many yards did he get in the second half?
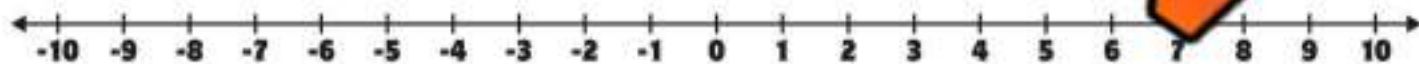
Yards in the second half = _____

4) Tiger Woods scored a –5 in his third round of a golf tournament. He scored +8 in the fourth round. How many more shots did he take in the fourth round?
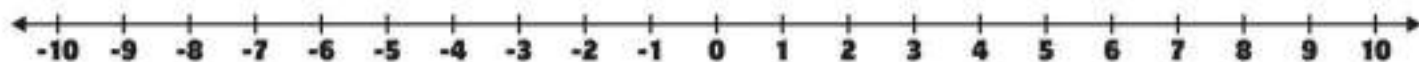
Extra shots in the fourth round = _____

Writing Integers

We can represent a situation using integers. In cases where we have less than zero, we can use a negative integer. When we have more than zero, we use a positive integer.

Example – Kaitlyn owes her father $20. Therefore, Kaitlyn has –$20.

Questions — Write the integer for the situation below

1) Claire owes her mom $100. Write this number as an integer.	2) New Orleans is 1m below sea level. Write this number as an integer.
3) The temperature on Monday ... The temperature on Tuesday ... 10°C. What is the temperature on Tuesday?	4) The football team lost 4 yards on their first play of the game. Write this number as an integer.
5) Mount Everest is 8,849m above sea level. Write this number as an integer.	6) The Dead Sea level is 423m below sea level. Write this number as an integer.
7) Savana owes $220 on her credit card. Write her current balance as an integer.	8) Jack was paid $250 from his employer. Write his new financial situation as an integer.
9) The temperature started the day at – 9°C and ended the day at –1°C. Write the **change** in temperature as an integer.	10) Alex is penalized 5 points for handing in his assignment late. Write this number as an integer.

Integers - Temperatures - Vertical Number Line

Questions | Use the number lines to solve the questions

1)

Difference = _____

2)
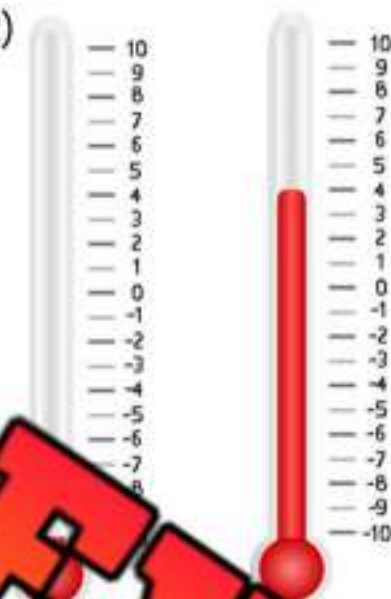
Difference = _____

3)
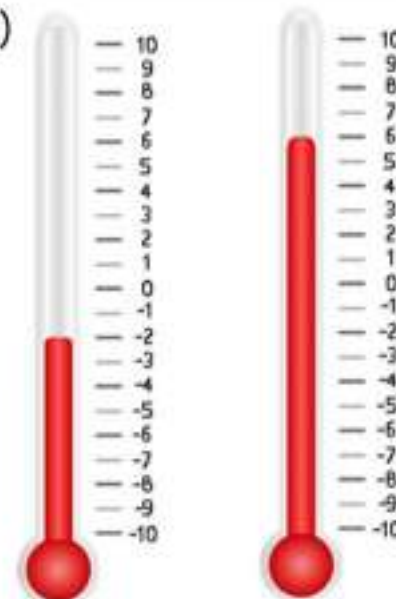
Difference = _____

4)
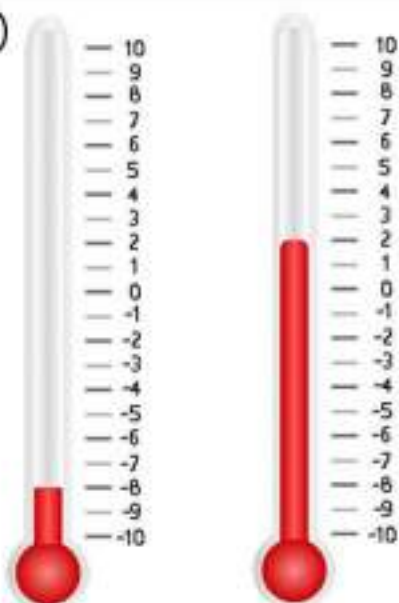
Difference = _____

5)

Difference = _____
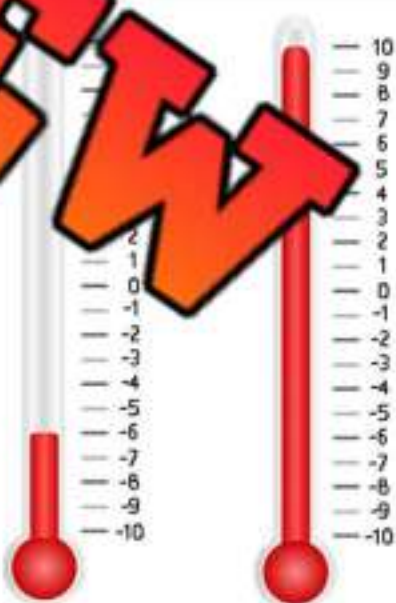
Difference = _____

Integers - Comparing Temperatures

Comparing Integers

Questions | Use the <, >, = to compare the integers below

1) 8 [ ] –6   2) –5 [ ] 4   3) –7 [ ] 3

4) –5 [ ] [ ]   5) [ ] –6   6) –3 [ ] –7

7) –3 [ ] 8   8) [ ]   9) 8 [ ] 6

10) –5 [ ] –7   11) –4 [ ] [ ] 4

13) –7 [ ] 2   14) –7 [ ] –8   15)

16) 2 [ ] –3   17) –6 [ ] –3   18) –1 [ ] –9

19) –3 [ ] 0   20) –9 [ ] –6   21) –2 [ ] –2

22) 6 [ ] –9   23) –5 [ ] –6   24) –3 [ ] 6

Ordering Integers – Least to Greatest

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
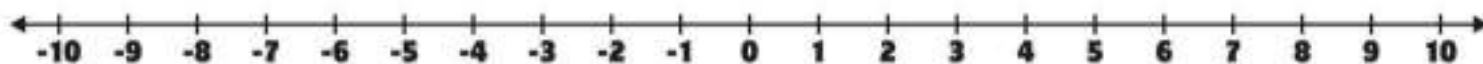
Part 1	Arrange the integers from least to greatest

1) 5, 3, −6, −9, 7	2) −4, 4, 8, 2, −9
3) _____ 9, −5	4) −5, −4, −6, −2, −7
5) 5, −3, _____	_) −5, −1, 6, 0, 2
7) 4, 0, −2, −9, −6	8) 11, _____ 12, −3, −5
9) 15, −23, −12, −16, 7	10) −15, −11 _____ 27

Part 2	Answer the word problem below

The average temperatures for the first 5 months of the year are recorded below. Arrange the months in order of coldest to warmest.

January = −5°C   February = −8°C   March = −3°C   April = 2°C   May = 10°C

_____, _____, _____, _____, _____

Ordering Integers - Greatest to Least

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
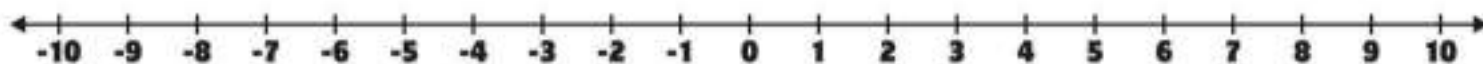
Part 1	Circle the largest integer

1) 7, 3, −8, −2, 1	2) −2, −3, −1, −4, 0
3) ?, −6, −1, 4	4) −5, 2, −3, −1, 5
5) ?, 2, −5, 2	6) 7, 6, −9, −4, 0

Part 2	Circle the smallest integer

1) 5, 2, −5, −8, 7	2) ?, 5, 7, 2, −9
3) 0, 3, −4, 9, −6	4) ?, −2, −3
5) 3, 2, −2, −3, 0	6) −1, ?, 3, ?

Part 3	Arrange the integers from greatest to least

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

Adding Integers - Visuals
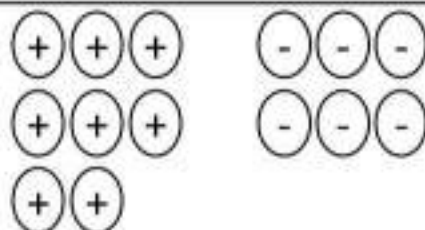
$$\underline{8} + \underline{(-6)} = \underline{2}$$

Question Fill in the equations below. What is the difference?

1) ___ + ___ = ___

2) ___ + ___ = ___

3) ___ + ___ = ___

4) ___ + ___ = ___

5) ___ + ___ = ___

6) ___ + ___ = ___

7) ___ + ___ = ___

8) ___ + ___ = ___

9) ___ + ___ = ___

10) ___ + ___ = ___

11) ___ + ___ = ___

12) ___ + ___ = ___
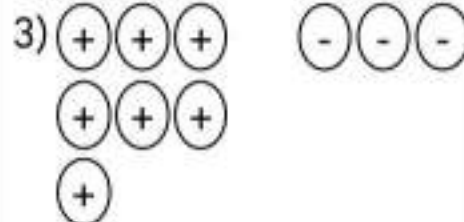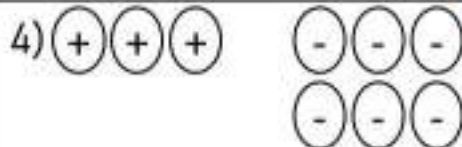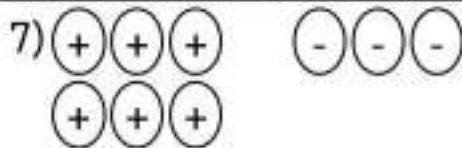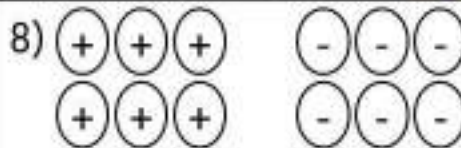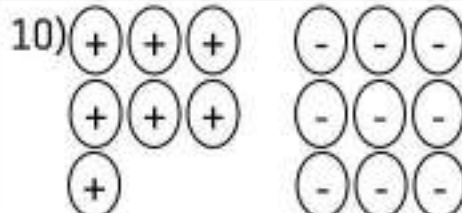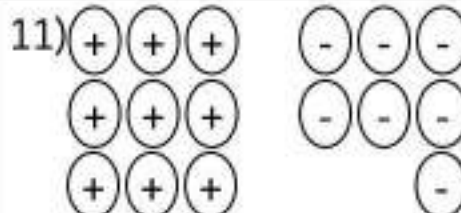
Adding Integers - Zero Pairs

Questions | Draw counter chips to represent the numbers and then use zero pairs

1) 3 + (−5) = −2

⊕ ⊕ ⊕   ⊖ ⊖ ⊖
          ⊖ ⊖

2) 5 + (−7) =

3) (−7) + 6 =

4) (

5) (−2) + 5 =

6) (−3) + 3 =

7) 6 + (−2) =

8) 10 +

9) 13 + (−8) =

10) (−10) + 8 =

11) (−13) + 9 =

12)

13) 19 + (−9) =

14) 15 + (−17) =

15) (−20) + 18 =

Golf - Adding Integers - Zero Pairs

Word Problems | Solve the word problems below using counter chips

1) Alice played 2 rounds of golf. Her final scores for both rounds are on the scorecard. What is the total score for the two rounds?

Round	Score
1	–7
2	+10
Total Score	

Equation: _____ + _____ = _____

2) Theo played three rounds of golf. His final scores for all three rounds are on the scorecard. What is the total score?

Round	Score
1	–4
2	–2
3	+4
Total Score	

Equation: _____ + _____ + _____ = _____

3) Leah played 4 rounds of golf. Her final scores are written on the scorecard. What is her total score?

R1	R2	R3		
–5	3	–3	–4	

Equation: _____ + _____ + _____ + _____ = _____

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

R1	R2	R3	R4	Total Score
7	2	–7	–3	

Equation: _____ + _____ + _____ + _____ = _____

Adding Integers - Using Number Lines

$5 + (-6) = -1$	
$-4 + 6 = 2$	
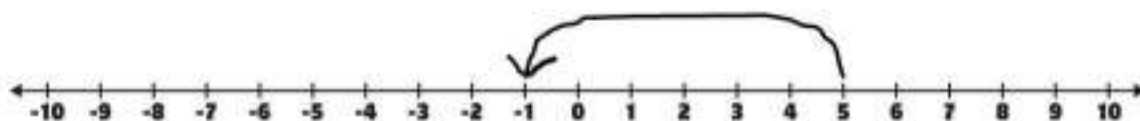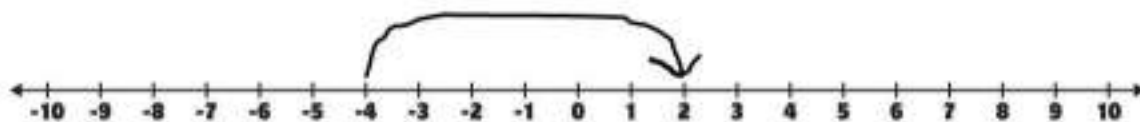
Questions — Use the number lines to solve the questions

1) $4 + \_\_ =$

2) $-2 + 5 =$

3) $7 + (-1) =$

4) $-6 + 6 =$

5) $7 + (-5) =$
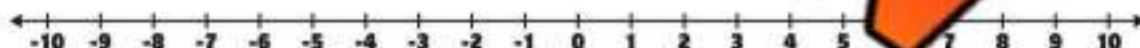
6) $-7 + 4 =$
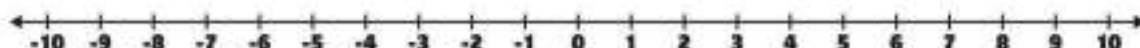
7) $8 + (-4) =$

8) $-8 + 5 =$

Adding Integers - Using Number Lines

Part 1	Use the number lines to solve the questions

1) 7 + (−4) =	-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
2) −9 + 10 =	-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
3) −5 __ =	-7 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
4) −7 + 11 =	-10 -9 -5 0 1 2 3 4 5 6 7 8 9 10
5) 8 + (−12) =	-10 -9 -8 -7 -6 -5 -4 -3 -2 1 4 5 6 7 8 9 10
6) −10 + 15 =	-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 4 9 10
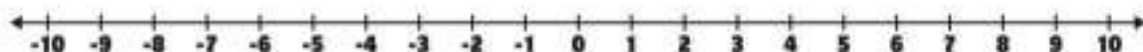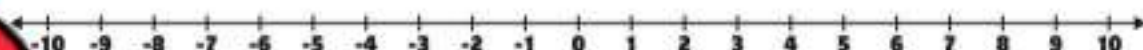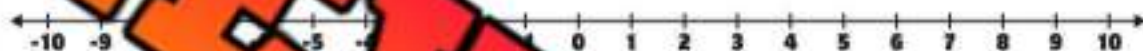
Part 2	Answer the word problems below – Write ___ ___

1) A football team loses 6 yards on one play and then loses 5 yards on the next play. How many total yards did they lose?

_____ + _____ = _____

2) In golf, Roger played two rounds. He scored a +4 and a −6. What was his total score?

_____ + _____ = _____

Adding Integers - Using Number Lines

-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

Part 1 — Solve the questions below

1) 5 + (   ) =

2) 1   ( )

3) –12 + 5 + (

4) 13 + (–6) + (–4) =

5) –11 + 4 + (–2) =

6) –15 + 11 + (–5) =

7) 17 + (–6) + (–8) =

8) –15 + (–5) + 11 =

9)   + (–7) =

10)   + (   ) =

Part 2 — Answer the word problems below. Write the equation

1) You take 9 steps forwards, 7 steps backwards, another 5 steps b   ds, and another 4 steps forwards. How many steps have you taken?

2) The Big Dipper rollercoaster climbs straight up 30m above ground level before it drops 18m. Next, it climbs another 22m before it drops 17m. When the ride is over, the participants are how much higher than ground level?

Adding Integers - Rules

Adding Integers Rules

(+) + (+) = (+) Adding 2 positive integers will always give a positive answer

(-) + (-) = (-) Adding 2 negative integers will always give a negative answer

(+) + (-) = (-) Adding integers with different signs → use the larger number

(+) + ( ) = (+) Adding integers with different signs → use the larger number

*** If the integers have the same sign, add them and keep the sign
*** If the integers have different signs, subtract them and use the sign of the larger number

Directions Use the rules to answer the 1-step questions below

1) 42 + (−13) =	5) 17 + (−121) =
2) 57 + (−66) =	6) (−151) + (−66) =
3) −132 + (−112) =	7) 213 + (−158) =
4) (+33) + (+86) =	8) −328 + (+113) =

Integers Quiz

-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

Part 1 Circle the largest integer

1) -4, 3	2) -4, -8, -2, -3, 0
3) 1, -3, 2, 4	4) -6, 4, -2, -3, 6

Part 2 Arrange the integers from least to greatest

1) -7, 2, -5, -8, 3	-5, 11, -11, -7

Part 3 Solve the questions below

1) 9 + (−5) =	2) 11 + (−9) =	3) (−15)
4) (−13) + 17 =	5) (−31) + 19 =	6) (−43) + 15 =

Part 4   Answer the word problems below. Write the equation for each question

1) The winner of a golf tournament scored a –28 after four rounds. The last place golfer scored a +33. What is the difference between these two scores?

2) The average temperature at the South Pole is –49 degrees Celsius. The average temperature in the North Pole is –20 degree Celsius. What is the difference in temperature between the two Poles?

3) You take 17 steps forwards, 15 steps backwards, and 25 steps backwards, and another 19 steps forwards. How many steps have you taken?

4) A submarine starts at sea level and dives 17m down before coming up 11m. It makes another plunge down 43m and then rises 27m. How many meters is it below sea level?

Mixed Numbers

Questions | Shade in the images to represent the mixed numbers

1) $3\frac{1}{5}$
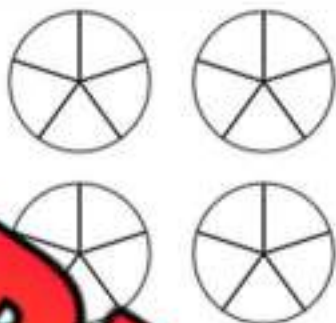
2) $5\frac{3}{4}$

3) $2\frac{2}{6}$

4) $4\frac{4}{8}$

5) $6\frac{6}{7}$

6) $8\frac{?}{?}$
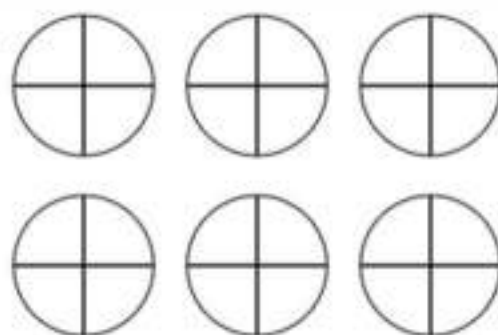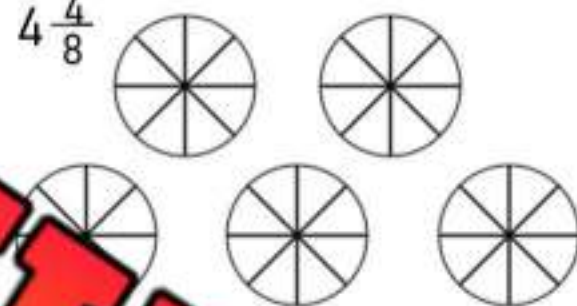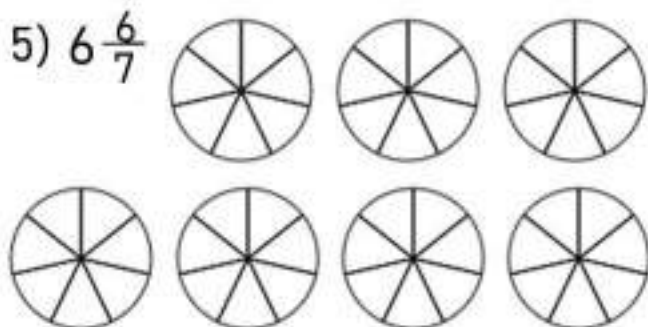
7) $7\frac{7}{12}$
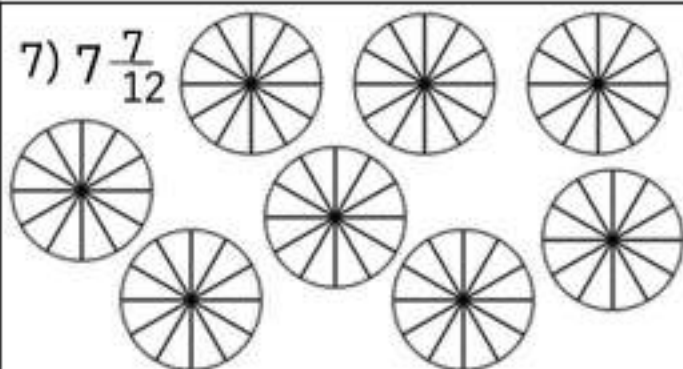
8) $1\frac{2}{3}$

Improper Fractions

Questions | Convert the mixed numbers into improper fractions

1) $1\frac{?}{?} = \overline{}$

2) $2\frac{2}{5} = \overline{}$

3) $4\frac{1}{2} = \overline{}$

4) $4\frac{3}{4} = \overline{}$

5) $6\frac{2}{6} = \overline{}$

6) $\frac{?}{8} = \overline{}$

7) $6\frac{2}{5} = \overline{}$

8) $4\frac{9}{12} = \overline{}$

9) $8\frac{7}{10} = \overline{}$

10) $3\frac{4}{7} = \overline{}$
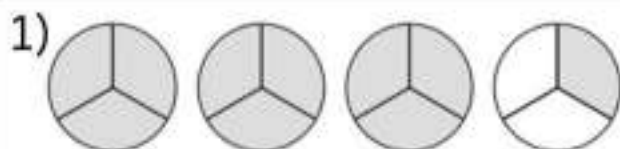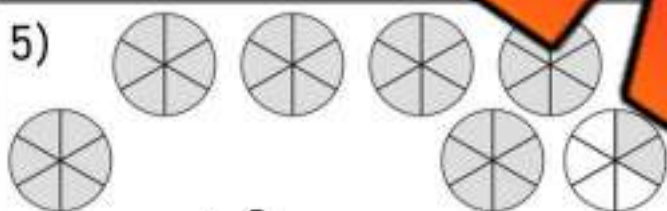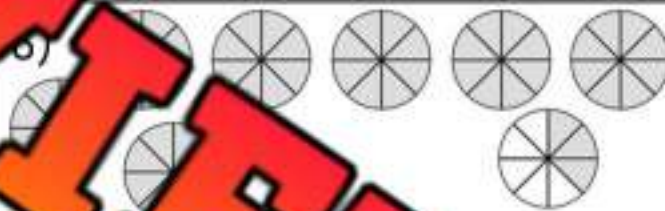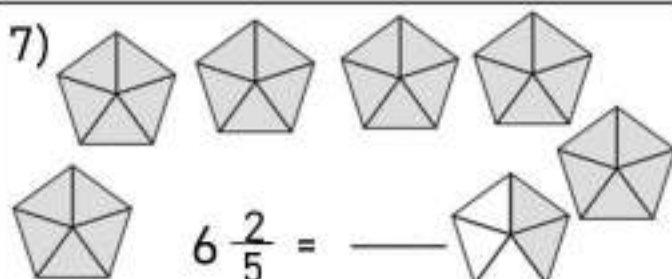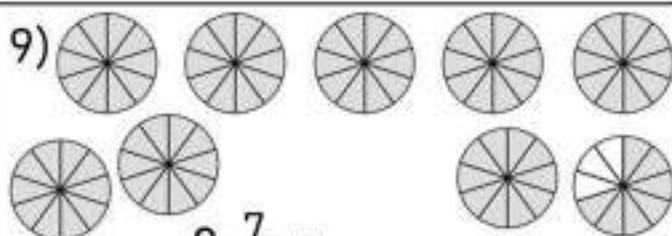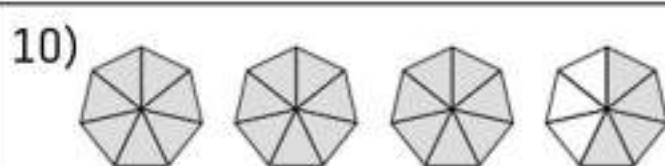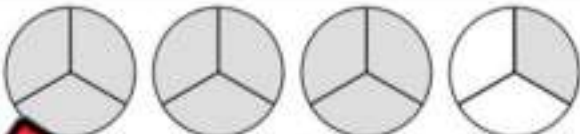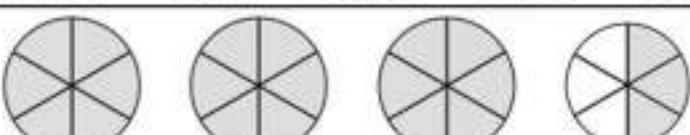
Matching the Mixed Numbers with Improper Fractions

Questions	Match the visual fractions with the improper fractions and mixed numbers

	Visual Fractions		Mixed Numbers and Improper Fractions
1) ___		a)	$5\frac{3}{4}$
2) ___		b)	$\frac{18}{5}$
3) ___		c)	$\frac{10}{3}$
4) ___		d)	$4\frac{1}{5}$
5) ___		e)	$6\frac{2}{4}$
6) ___			$\frac{21}{}$
7) ___			$3\frac{4}{7}$
8) ___		h)	$\frac{22}{4}$
9) ___		i)	$5\frac{4}{5}$
10) ___		j)	$\frac{23}{5}$

Converting Mixed Numbers to Improper Fractions

Questions | Convert the mixed numbers to improper fractions

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

2) $4\frac{1}{5}$ =

3) $5\frac{4}{5}$ =

4) $2\frac{5}{?}$ =

5) $3\frac{4}{7}$ =

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

7) $4\frac{2}{4}$ =

8) $\frac{?}{5}$

9) $2\frac{3}{7}$ =

10) $5\frac{2}{3}$ =

11) $3\frac{4}{8}$ =

12) $\frac{2}{?}$ =

13) $4\frac{1}{5}$ =

14) $2\frac{2}{7}$ =

15) $\frac{?}{8}$

16) $7\frac{1}{2}$ =

17) $6\frac{2}{4}$ =

18) $8\frac{3}{4}$ =

19) $4\frac{1}{2}$ =

20) $3\frac{4}{5}$ =

21) $5\frac{4}{5}$ =

Ordering Mixed Numbers

Questions	Put the mixed numbers in order from least to greatest

1) $4\frac{2}{4}$ $2\frac{3}{7}$ $5\frac{3}{5}$ $2\frac{1}{7}$ $2\frac{6}{7}$

2) 2 $1\frac{2}{5}$ $4\frac{2}{6}$ $7\frac{3}{7}$ $4\frac{5}{6}$

3) 2 $\frac{3}{7}$ $3\frac{3}{8}$ $4\frac{3}{4}$ $4\frac{1}{4}$

4) $8\frac{2}{6}$ $1\frac{1}{4}$ $5\frac{3}{6}$ $8\frac{3}{6}$

5) $6\frac{2}{5}$ $6\frac{1}{5}$ $3\frac{3}{9}$ $\frac{3}{}$

6) $4\frac{2}{5}$ $1\frac{2}{7}$ $1\frac{3}{7}$ $3\frac{3}{7}$

7) $6\frac{4}{8}$ $6\frac{3}{8}$ $4\frac{1}{5}$ $4\frac{3}{5}$ $6\frac{7}{8}$

8) $8\frac{4}{6}$ $3\frac{1}{4}$ $3\frac{2}{4}$ $8\frac{3}{6}$ $1\frac{3}{4}$

Proper Fractions - Number Line

A **proper fraction** has a numerator (top number) smaller than the denominator (bottom number). When we place a proper fraction on a number line, it will always fall between 0 and 1.

$$\longleftarrow \quad 0 \qquad \frac{1}{3} \qquad \frac{2}{3} \qquad 1 \quad \longrightarrow$$
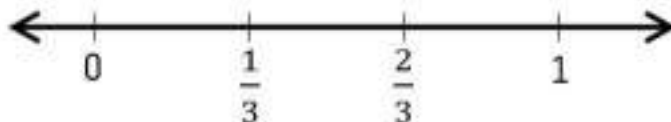
Example
1) The denominator tells us how many equal parts are between 0 and 1
2) The numerator tells us how many parts starting from zero we move to plot our fraction

Practice — Plot the proper fractions on the number lines below
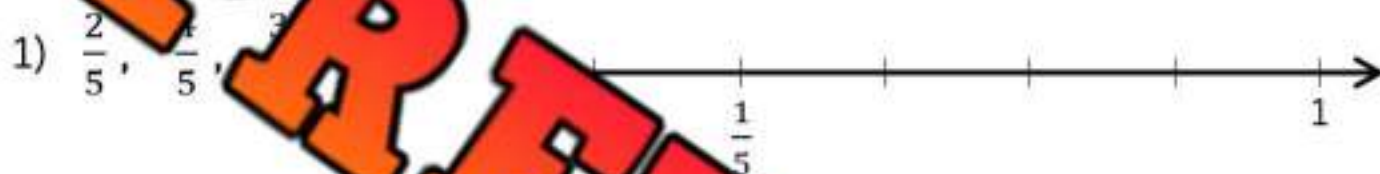
1) $\frac{2}{5}$, $\frac{4}{5}$, $\frac{3}{5}$

$$\frac{1}{5} \qquad\qquad\qquad 1$$

Put in order from least to greatest: _____

2) $\frac{3}{7}$, $\frac{1}{7}$, $\frac{5}{7}$, $\frac{4}{7}$

$$\longleftarrow \quad 0 \qquad\qquad\qquad 1 \quad \longrightarrow$$

Put in order from least to greatest: _____

3) $\frac{5}{9}$, $\frac{3}{9}$, $\frac{8}{9}$, $\frac{7}{9}$

$$\longleftarrow \quad 0 \qquad\qquad\qquad 1 \quad \longrightarrow$$

Put in order from least to greatest: _____

4) $\frac{4}{10}$, $\frac{8}{10}$, $\frac{2}{10}$, $\frac{5}{10}$

$$\longleftarrow \quad 0 \qquad\qquad\qquad 1 \quad \longrightarrow$$
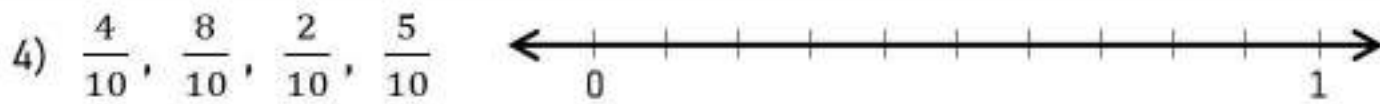
Put in order from least to greatest: _____

Equivalent Fractions

Questions | Fill in the blanks to find equivalent fractions

1) $\dfrac{1}{2} = \dfrac{2}{} = \dfrac{}{6} = \dfrac{4}{} = \dfrac{}{10} = \dfrac{6}{} = \dfrac{}{14}$

2) $\dfrac{1}{} = \dfrac{2}{} = \dfrac{}{9} = \dfrac{4}{} = \dfrac{}{15} = \dfrac{6}{} = \dfrac{}{21}$

3) $\dfrac{1}{4} = \dfrac{}{} = \dfrac{}{16} = \dfrac{}{20} = \dfrac{6}{} = \dfrac{}{28}$

4) $\dfrac{1}{5} = \dfrac{2}{} = \dfrac{}{15} = \dfrac{}{20} = \dfrac{}{} = \dfrac{6}{} = \dfrac{7}{}$

5) $\dfrac{1}{6} = \dfrac{}{12} = \dfrac{3}{} = \dfrac{4}{} = \dfrac{}{} = \dfrac{}{} = \dfrac{}{42}$

6) $\dfrac{1}{7} = \dfrac{}{14} = \dfrac{}{21} = \dfrac{4}{} = \dfrac{5}{} = \dfrac{}{42} = \dfrac{}{49}$

7) $\dfrac{1}{8} = \dfrac{}{16} = \dfrac{3}{} = \dfrac{4}{} = \dfrac{5}{} = \dfrac{}{48} = \dfrac{}{56}$

8) $\dfrac{1}{9} = \dfrac{}{18} = \dfrac{3}{} = \dfrac{}{36} = \dfrac{}{45} = \dfrac{6}{} = \dfrac{7}{}$

Equivalent Fractions

Name: _____

| Questions | Write your own equivalent fractions |

1) $\dfrac{2}{3}$ = ___ = ___ = ___ = ___ = ___ = ___

2) $\dfrac{3}{?}$ = ___ = ___ = ___ = ___ = ___ = ___

3) $\dfrac{5}{7}$ = ___ = ___ = ___ = ___ = ___ = ___

4) $\dfrac{2}{9}$ = ___ = ___ = ___ = ___ = ___ = ___

5) $\dfrac{5}{6}$ = ___ = ___ = ___ = ___ = ___ = ___

6) $\dfrac{4}{9}$ = ___ = ___ = ___ = ___ = ___ = ___

7) $\dfrac{3}{5}$ = ___ = ___ = ___ = ___ = ___ = ___

8) $\dfrac{7}{10}$ = ___ = ___ = ___ = ___ = ___ = ___

Proper Fractions - Number Line

Practice | Plot the fractions on the number line

1) $\frac{2}{8}$, $\frac{1}{8}$, $\frac{5}{8}$, $\frac{3}{8}$, $\frac{7}{8}$, $\frac{6}{8}$

⟵———————————————————————⟶

2) $\frac{3}{10}$, $\frac{}{10}$, $\frac{5}{1}$, $\frac{9}{10}$, $\frac{6}{10}$

⟵———————————————————————⟶

3) $\frac{7}{8}$, $\frac{5}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{2}{2}$

⟵———————————————————————⟶

4) $\frac{11}{12}$, $\frac{9}{12}$, $\frac{7}{12}$, $\frac{5}{6}$, $\frac{3}{6}$, $\frac{1}{6}$, $\frac{1}{3}$, $\frac{3}{3}$

⟵———————————————————————⟶

Mixed Numbers on a Number Line

Practice | Plot the mixed fractions on the number line

1) $1\frac{1}{4}$, $2\frac{2}{4}$, $2\frac{1}{4}$, $1\frac{3}{4}$

1   2   3

2) $2\frac{3}{6}$, $1\frac{5}{6}$, $\frac{1}{6}$, $1\frac{1}{6}$

1   3
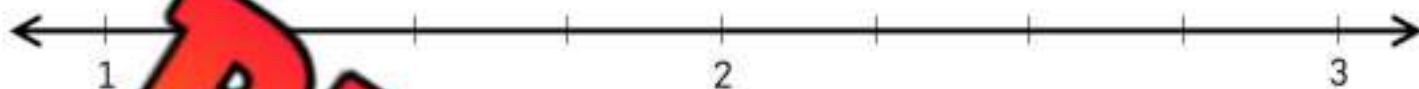
3) $6\frac{2}{5}$, $5\frac{1}{5}$, $6\frac{4}{5}$, $5\frac{3}{5}$, $5\frac{2}{5}$, $6\frac{1}{5}$, $6\frac{4}{5}$

5   6   7

4) $1\frac{1}{2}$, $3\frac{1}{2}$, $2\frac{1}{2}$

0   1   2   3   4
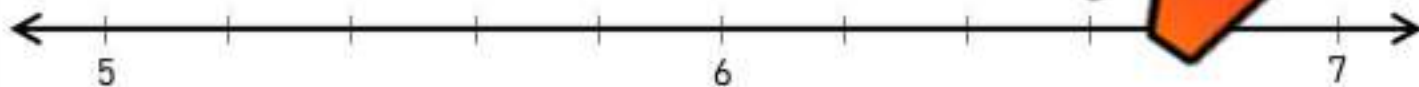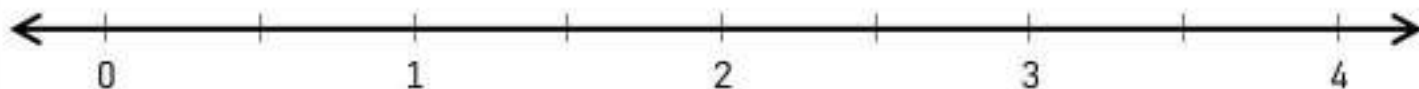
Fractions on a Number Line

Practice | Plot the fractions on the number line

1) $\frac{16}{8}$, $\frac{1}{2}$, $\frac{7}{2}$, $1\frac{1}{2}$
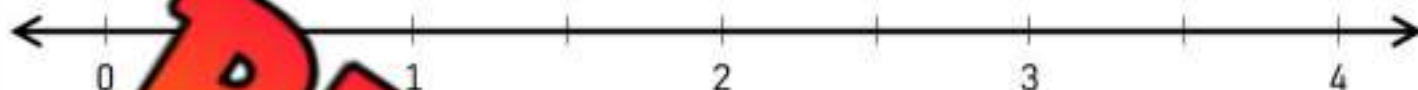
2) $\frac{4}{6}$, $\frac{10}{6}$, $1\frac{3}{?}$, $\frac{1}{?}$

3) $\frac{3}{5}$, $\frac{7}{5}$, $1\frac{3}{5}$, $\frac{9}{5}$, $\frac{4}{10}$, $\frac{3}{15}$
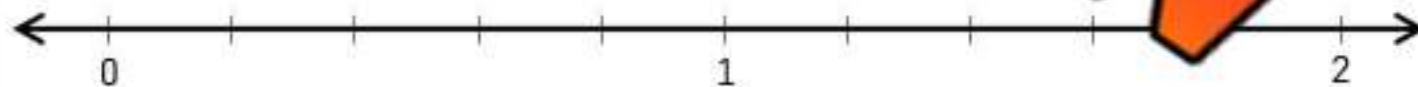
4) $\frac{1}{4}$, $\frac{6}{4}$, $\frac{10}{8}$, $\frac{6}{8}$, $1\frac{3}{4}$
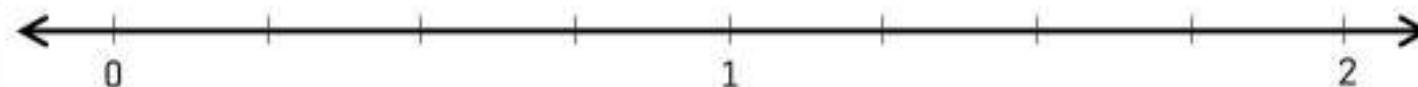
Comparing and Ordering Fractions

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

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

2) $\frac{3}{4}$ ☐   5) $\frac{9}{1}$ ☐ $\frac{8}{1}$ 8) $\frac{2}{10}$ ☐ $\frac{10}{2}$

3) $\frac{5}{9}$ ☐   ☐ $\frac{5}{4}$ 9) $\frac{6}{1}$ ☐ $\frac{5}{1}$

Part 2   Arrange the fractions from least to greatest

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

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

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

Quiz - Fractions

Part 1 — Write the fraction beside the visual fractions

1)   ___ ___

2)   ___ ___
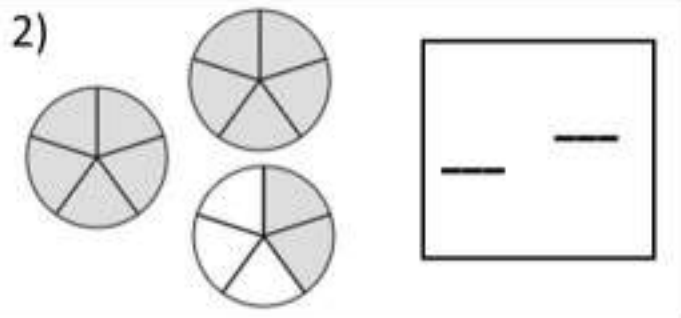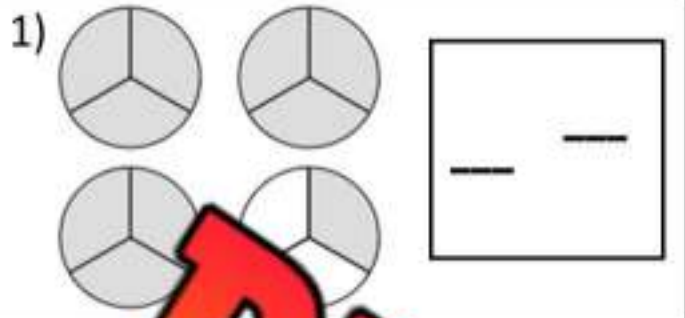
Part 2 — Convert the improper fractions to mixed numbers

1) $\dfrac{13}{5}$ =

3) $\dfrac{11}{3}$ =

Part 3 — Convert the mixed numbers to improper fractions

1) $5\dfrac{3}{4}$ =

2) $4\dfrac{1}{5}$ =

Part 4 — Put the mixed numbers in order from least to greatest

1) $4\dfrac{2}{4}$ $2\dfrac{3}{7}$ $5\dfrac{3}{5}$ $2\dfrac{1}{7}$ $2\dfrac{}{7}$

2) $3\dfrac{2}{4}$ $1\dfrac{2}{5}$ $4\dfrac{2}{6}$ $7\dfrac{3}{7}$ $4\dfrac{5}{6}$

Part 5   Put the improper fractions in order from least to greatest

$$\frac{16}{5} \qquad \frac{13}{5} \qquad \frac{9}{5} \qquad \frac{21}{4} \qquad \frac{16}{4} \qquad \frac{21}{5}$$

Part 6   Plot the fractions on the number line

1) $\frac{5}{8}$, $\frac{7}{8}$, $\frac{6}{8}$

2) $2\frac{3}{6}$, $1\frac{2}{6}$, $2\frac{5}{6}$, $1\frac{4}{6}$, $2\frac{1}{6}$, $1\frac{1}{6}$
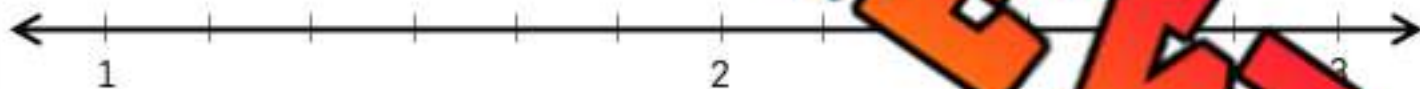
3) $\frac{4}{6}$, $\frac{10}{6}$, $\frac{10}{12}$, $1\frac{3}{6}$, $\frac{8}{6}$, $1\frac{1}{6}$
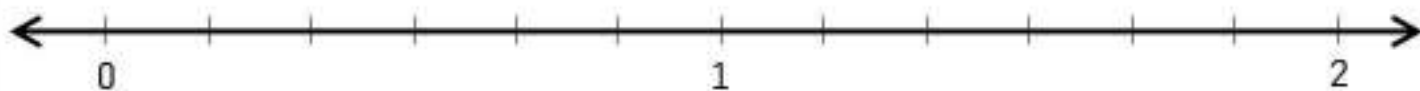
Ratio In 3 Ways

Part 1	Write the ratios for the questions below

1) Ratio of 35 balls to 78 strikes.

Words: _____

Ratio: _____

Fraction: _____

2) Ra___ ___ dunks t___ ___hree pointers

Words: _____

~~Ratio~~: _____

___tion: _____

3) Ratio of 10 cars to 3 trucks

Words: _____

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) ___tio of 3 ___ass ___ 1 shot

Words: _____

Ratio: _____

Fraction: _____

8) ___ treat to healthy sna___

Words: _____

___: _____

___: _____

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?

Ratios

A **ratio** shows the relationship between two amounts.
Example

The ratio of bananas to apples is 1:8. For every banana you have, you have 8 apples.
This means that if you had 3 bananas, you would have 24 apples.

Questions | Write the ratios for the questions below

The ratio of cookie to cupcake is _____ : _____

If you had 4 cookies, how many cupcakes would you have? _____ cupcakes

The ratio of tomato to onion is _____ : _____

If you had 6 tomatoes, how many onions would you have? _____ onions

The ratio of pizza to drink is _____ : _____

If you had 6 pizzas, how many drinks would you have? _____ drinks

The ratio of burger to fries is _____ : _____

If you had 12 burgers, how many fries would you have? _____ fries

The ratio of pineapples to strawberries is _____ : _____

If you had 20 pineapples, how many strawberries would you have? _____ strawberries

The ratio of jam to bread is _____ : _____

If you had 9 jars of jam, how many loaves of bread would you have? _____ loaves

Equivalent Ratios - Scaling Up and Down

A **ratio** shows the relationship between two amounts.
Example

The ratio of cars to bikes is 2:8. There are four times as many bikes as cars. You could also say there are four times less cars than bikes. We can scale down the ratio and say the ratio of cars to bikes is 1:4. We can also scale up by saying the ratio of cars to bikes is 4:16. These are equivalent ratios.

Questions _____ the ratio of the images. Then write a scaled up and down equivalent ratio

	Scaled Up	Scaled Down

The ratio of skates to _____

	Scaled Up	Scaled Down

The ratio of laptops to televisions is: _____ : _____

		Down

The ratio of erasers to pencils is: _____ : _____.

	Scaled Up	Scaled Down

The ratio of juice to chips is: _____ : _____.

	Scaled Up	Scaled Down

The ratio of basketballs to soccer balls is: _____ : _____.

Equivalent Ratios - Scaling Up and Down

| Questions | Circle two equivalent ratios for each of the questions below |

1) 2:8	2:6	4:8	4:16	1:4	1:2
2) 2:12	1:8	4:22	1:6	1:4	4:24
3)		12:14	12:18	12:16	3:8
4) 2:4			4:8	1:4	1:2
5) 10:12	20:24	5:1	5:	10:24	5:6
6) 5:10	1:2	5:20	10:1	10:2	10:30
7) 4:14	2:10	8:28	2:7	7:	:24
8) 10:30	10:60	20:15	5:15	20:60	20:10
9) 2:20	6:60	6:80	1:20	1:30	1:10
10) 4:8	8:12	8:16	8:14	2:4	2:6

Ratios Word Problems - At the Zoo

Questions ☐ Draw pictures ☐ Use a solution statement ☐ Show your thinking

1) At the zoo, the ratio of lions to leopards is 4:1. There are 6 leopards. How many lions are there?
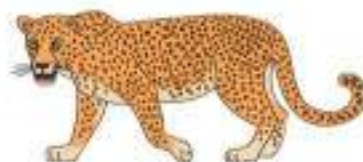
2) At the zoo, the ratio of _____ to goat___ __5. There are 4 eagles. How many goats are there?

3) At the zoo, the ratio of alligators to crocodiles must be 3:7. There a__ 9 alligators and 25 crocodiles. How many crocodiles do they need to release?

b) How many alligators could they have gotten if they didn't want to give any crocodiles away?

Quiz - Ratios

| Part 1 | Write the ratios for the questions below |

1) Ratio of 41 balls to 67 strikes.	Words: _____ Ratio: _____ Fraction: _____	3) Ratio of 27 cars to 12 trucks.	Words: _____ Ratio: _____ Fraction: _____
2) Ratio of 10 green apples 15 red apples.	Words: _____ Ratio: _____ Fraction: _____	4) Ratio of 25 students to 1 teacher.	Words: _____ Ratio: _____ Fraction: _____

| Part 2 | Fill in the ratio tables to help answer the questions |

1) A store sells sugar by the kilogram. If a 3kg bag costs $7.50, how much would a 1kg bag cost. Use the ratio table to help find the answer.

Sugar (kg)	Cost $
	7.50

2) Sam drives 550 kilometres in 5 hours. How fast did he drive per hour? Use the ratio table.

Hours	Distance
1	
2	
3	
4	
5	550

Part 3	Answer the word problems below

1) At the zoo, the ratio of gorillas to monkeys is 1:5. There are 5 gorillas in the zoo. How many monkeys are there?

2) At the z... ...atio of snakes to lizards is 1:10. There are 20 lizards. How many snakes are there...

3) At the zoo, the ratio ...li... ...ph... ...to be 2:6. One of the lions is released back into the wild. How many el... ...hould...

Part 4	Circle two equivalent ratios for eac... ...qu... ...be...w

1) 2:8	2:6	4:8	4:16	1:4	1:2
2) 2:12	1:8	4:22	1:6	1:4	4:24
3) 6:8	3:4	12:14	12:18	12:16	3:8
4) 2:4	4:6	4:7	4:8	1:4	1:2

Grade 6

Patterns and Relations

	Curriculum Expectations	Pages
PR01	Students will be expected to demonstrate an understanding of the relationships within tables of values to solve problems.	5 – 14, 17 – 38
P		5,
PR03	Students will be expected to represent generalizations arising from number relationships using equations with letter variables.	42 – 89
PR04	Students will be expected to demonstrate and explain the meaning of preservation of equality concretely, pictorially, and symbolically.	90 – 93

Preview of 80 pages from this product that contains 188 pages total.

Input/Output Table - Addition

Rule: add 5

In	Out
225	230
270	275
303	308
481	486

Questi... ....Fill in the input/output tables below

Rule: add ...

In	
105	
113	
134	
168	

Rule: add 6

	Out
2...	
2...	
2...	

Rule: add 5

In	Out
295	
303	
321	
347	

Rule: add 8

In	Out
301	
335	
373	
418	

Rule: add ...

In	Out
452	
485	
498	
528	

Rule: add 7

	Out
...	
57...	
593	

Rule: add 11

In	Out
605	
631	
676	
689	

Rule: add 13

In	Out
702	
726	
763	
799	

Rule: add 16

In	Out
810	
831	
849	
876	

Input/Output Table - Multiplication

Rule: multiply by 2

In	Out
3	6
5	10
7	14
9	18

Question: _____ the input/output tables below

Rule: multiply ___

In	Out
5	
10	
20	
50	

Rule: multiply by 6

In	Out

Rule: multiply by 5

In	Out
5	
10	
20	
50	

Rule: multiply by 4

In	Out
7	
12	
15	
25	

Rule: multiply ___ 3

In	Out
21	
33	
50	
110	

Rule: multiply by 7

In	Out
	8
	12
20	

Rule: multiply by 8

In	Out
5	
10	
20	
100	

Rule: multiply by 10

In	Out
8	
11	
16	
31	

Rule: multiply by 11

In	Out
6	
8	
10	
20	

Pattern Rule - Input/Output Tables

Add 10

In	Out
20	30
30	40
50	60
90	100

Question Fill in the input/output tables below

Rule: add (PREVIEW)

In	Out
43	
	72
	91
113	

Rule: add 3

In	Out
24	
4?	
	87
1?	

Rule: add 8

In	Out
71	
	94
113	
	149

Rule: subtract 7

In	Out
	58
96	
	131
164	

Rule: subtract (PREVIEW)

In	Out
112	
153	
	177
	193

Rule: subtract 12

In	Out
	141
	168
199	

Rule: subtract 11

In	Out
	215
	268
292	
305	

Rule: add 13

In	Out
	326
361	
385	
	400

Rule: add 15

In	Out
412	
436	
	468
	497

Pattern Rule - Input/Output Tables

Fill in the input/output tables below

Rule: Subtract 16

In	Out
49	
7?	
	82
	101

Rule: Add 14

In	Out
81	
127	
	174
	201

Rule: ~~Multiply 2~~

In	Out
15	
42	
	120
	164

Rule: Multiply by 3

In	Out
12	
31	
	120
	183

Rule: Divide by 2

In	Out
28	
42	
	36
	51

Rule: ~~by 5~~

In	Out
20	
45	
	12
	18

Rule: Subtract by 19

In	Out
147	
182	
	240
	276

Rule: Add 21

In	Out
305	
328	
	364
	378

Graphing Patterns - Table of Values

Questions | Translate the growing patterns into a table of values and a graph

A train has the following people in each train car.

Car 1   Car 2   Car 3   Car 4

People (y-axis, 0–8)
Cars (x-axis, 1–5)
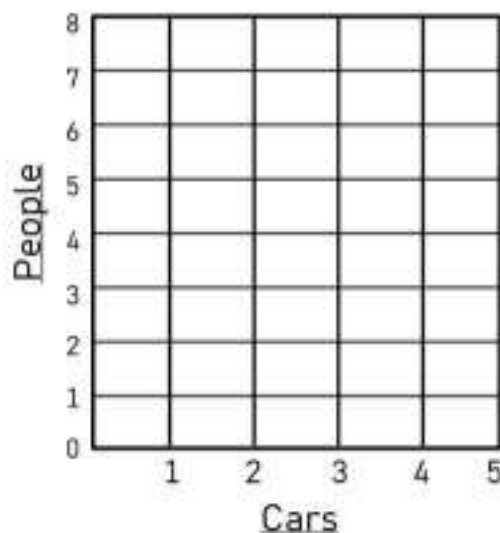
Term Number (Cars)	1	2		4	5	8
Term Value (People)						

1) What is the pattern rule? Start at ____, _____ each time.

2) How many people would be in train car 10?

3) Is the line on the graph straight or curved? Why do you think that is?

4) How many people would be in train car 20?

Graphing Patterns - Table of Values

Questions | Translate the growing patterns into a table of values and a graph

Steven is looking for golf balls in the woods. He finds the following balls each hour.

Hr 1   Hr 2   Hr 3

(graph: Golf Balls vs Hours, y-axis 0–10, x-axis 1–5)
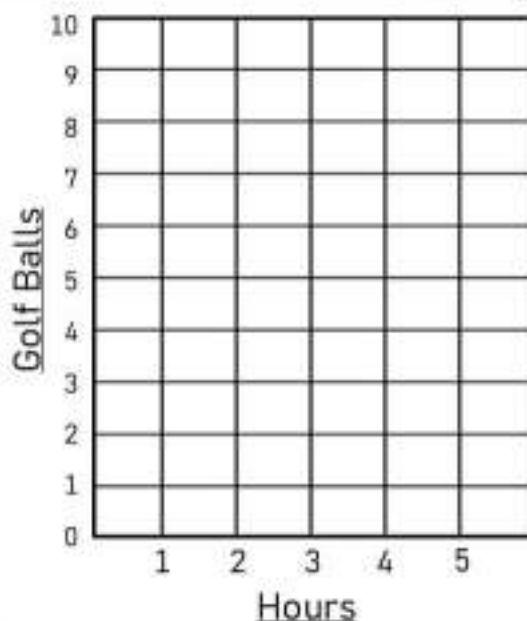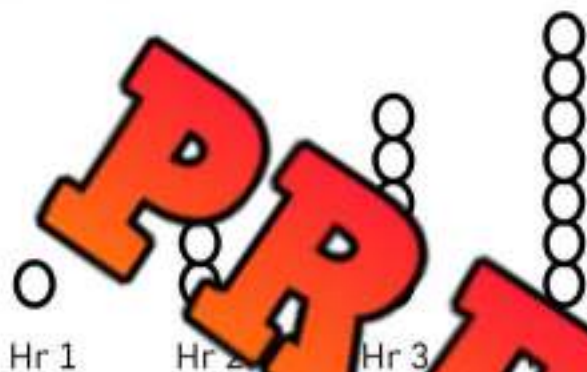
Term Number (Hour)	1	2	3	4	5	9
Term Value (Golf Balls)						

1) What is the pattern rule? Start at ____, _____ each time

2) How many golf balls would Steven find in his 12th hour of looking

3) If the graph continued, could a straight line that continued tell you a future term number? Explain.

4) What hour would Steven find 27 golf balls?

Graphing Patterns - Table of Values

1) Stacy marks an x each day for how many pieces of fruit she eats.

Day 1   Day   Day

Of Fruit Pieces

14
12
10
8
6
4
2
0
   1   2   3   4   5
        Days
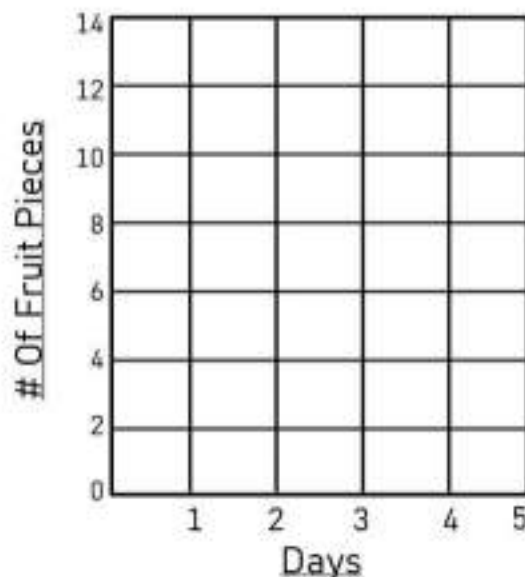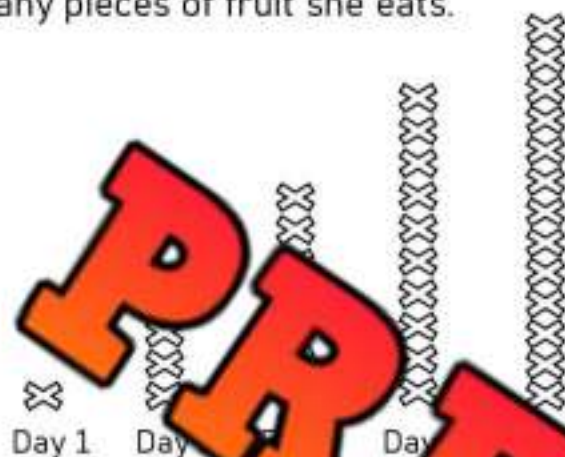
Term Number (Day)	1			4	5	6	10
Term Value (Fruit Pieces)							

2) Chris puts a rectangle for every book he reads in the first 5 months of school.

Month 1   Month 2   Month 3   Month 4

Of Books Read

10
8
6
4
2
0
   1   2   3   4
       Months
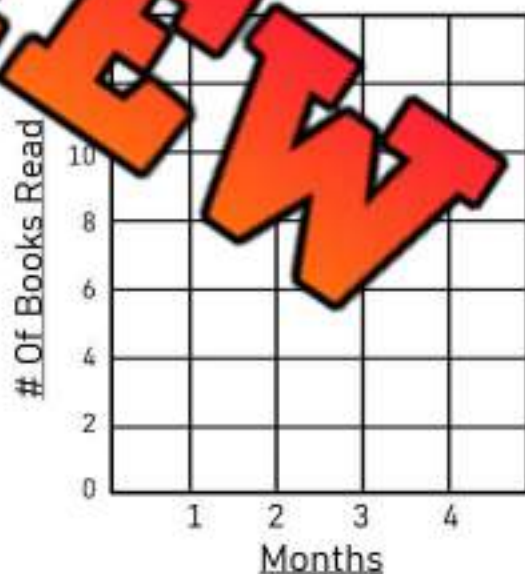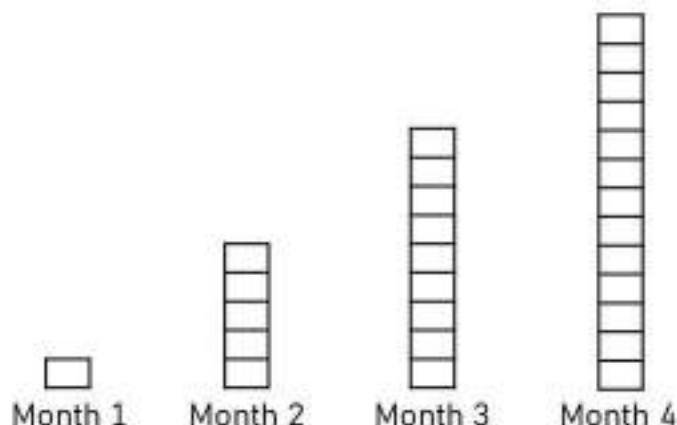
Term Number (Month)					5	9
Term Value (Books Read)						

Reading a Linear Pattern - Graph

A **linear** pattern is a pattern that <u>increases</u> or <u>decreases</u> by a value that remains the same. Linear patterns can be plotted as a straight line on a graph.

Questions | Continue the line on the graph and fill in the table of values

Toothpick Pattern

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) Why is this graph a linear pattern?

Increasing Linear Patterns - Yes or No?

Questions Circle if the pattern displayed on the graph is linear or not
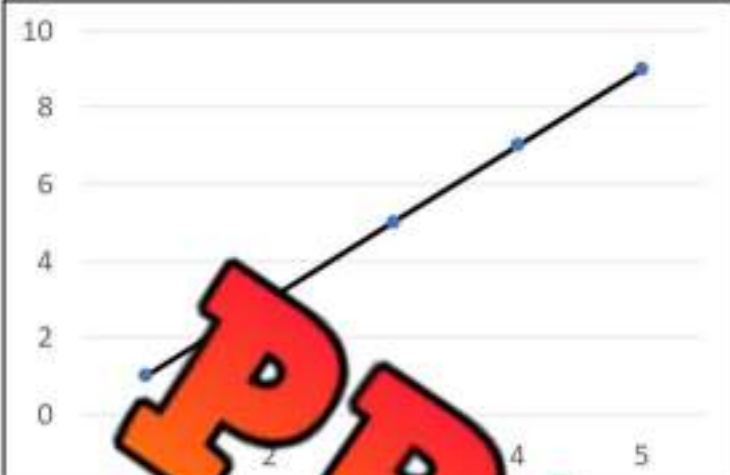
1)   Linear   Non-Linear
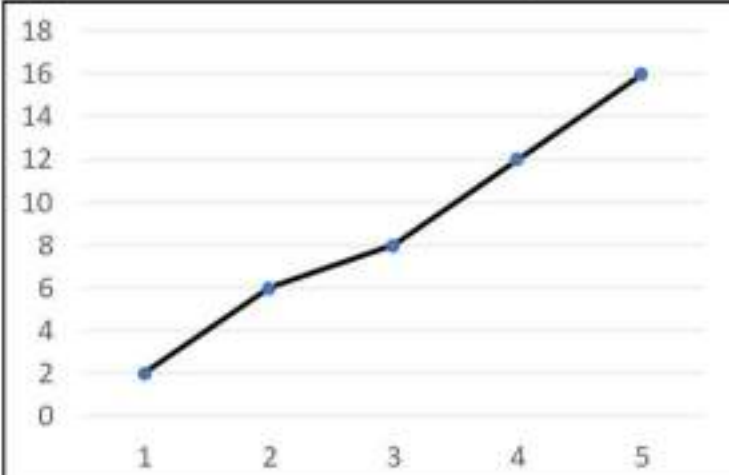
2)   Linear   Non-Linear
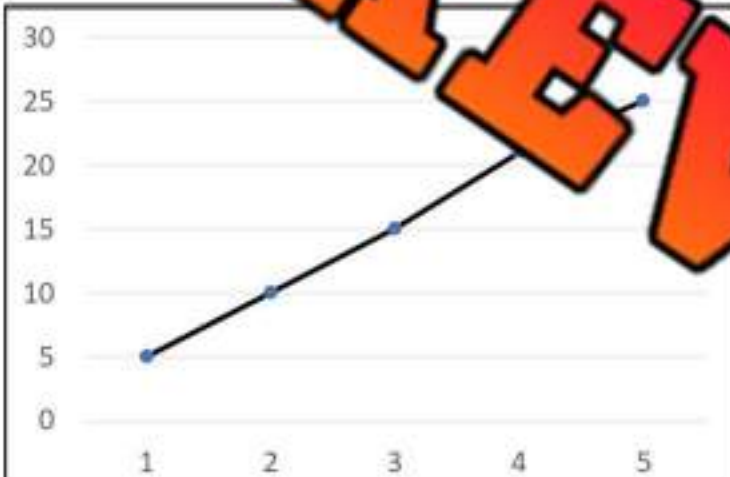
3)   Linear   Non-Linear
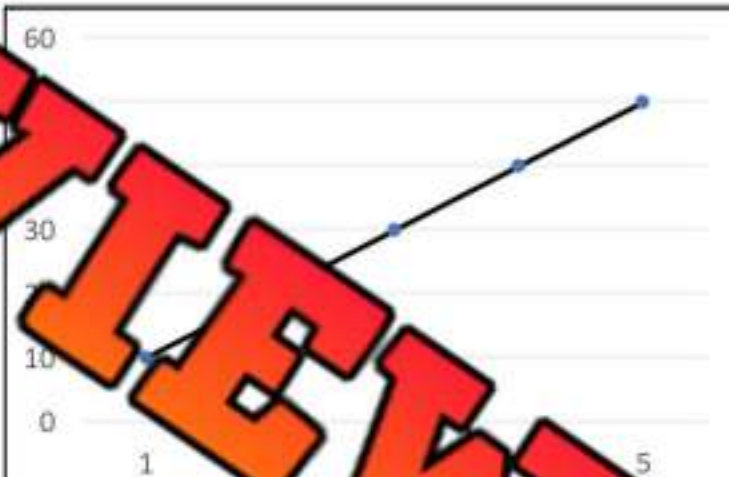
4)   Linear   Non-Linear
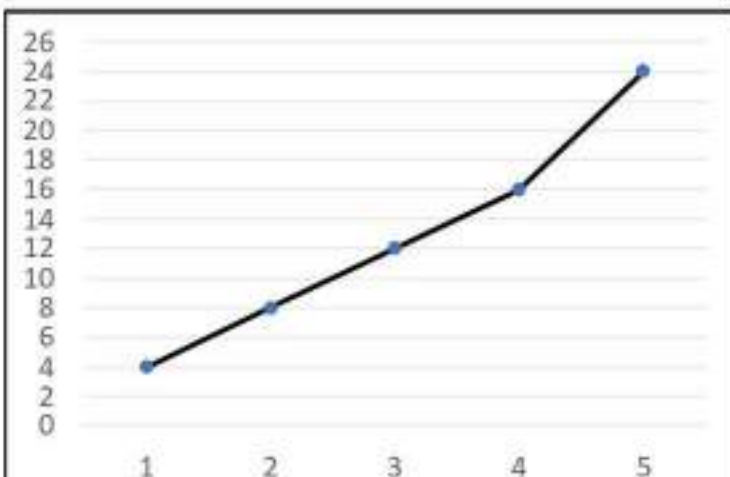
5)   Linear   Non-Linear

6)   Linear   Non-Linear

Name: _____
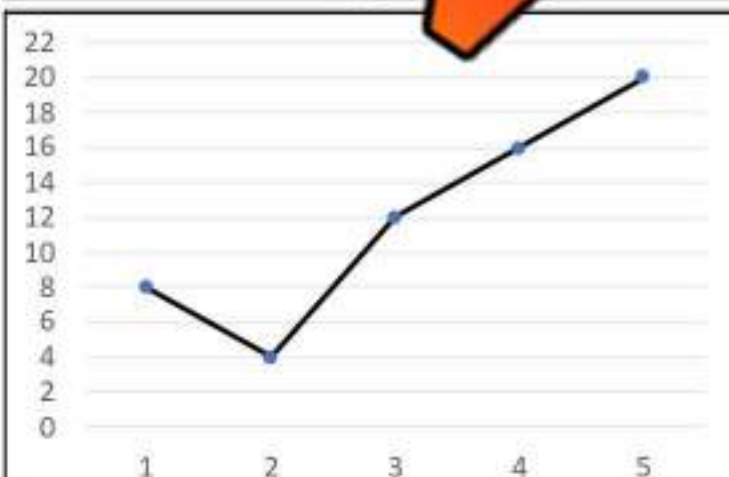
Increasing Linear Patterns - Yes or No?

Questions — Circle if the pattern is linear or not based on the table of values

1)

Term Number	Term Value
1	2
2	6
3	10
4	16
Linear	Non-Linear

2)

Term Number	Term Value
1	10
2	16
3	20
4	26
5	32
Linear	Non-Linear

3)

Term Number	Term Value
1	15
2	18
3	21
4	25
5	28
Linear	Non-Linear

4)

Term Number	Term Value
1	14
2	19
3	24
4	29
5	34
Linear	Non-Linear

5)

Term Number	Term Value
1	
2	
3	
4	
5	74
Linear	Non-Linear

6)

Term Number	Term Value
1	25
2	75
3	125
4	175
5	225
Linear	Non-Linear

7)

Term Number	Term Value
1	112
2	126
3	138
4	152
5	166
Linear	Non-Linear

8)

Term Number	Term Value
1	210
2	260
3	310
4	360
5	410
Linear	Non-Linear

9)

Term Number	Term Value
1	500
2	650
3	700
4	850
5	1000
Linear	Non-Linear

Name: _____   19

Toothpick Linear Patterns

A **linear** pattern is a pattern that <u>increases</u> or <u>decreases</u> by a value that remains the same. Linear patterns can be plotted as a straight line on a graph.

Questions   Answer the question below using a table of values and a graph

Kelly has made a pattern using toothpicks. She has displayed her pattern below.

Term 1	Term 2	Term 3	Term 4	Term 5

Term Number	Term Value

1) Why is this a linear pattern?

2) Extend the line on the graph. What will be the 7th and 10th term value?

7th term _____   10th term _____

Recursive vs Functional Relationships

In a linear pattern, we can have a recursive or functional relationship between variables. A **recursive relationship** describes the pattern between successive numbers in one of the rows/columns of a table of values.

   A **functional relationship** is a general rule to describe the relationship between the dependent and independent variable in a table of values. To find the **function**, we look across the table instead of beside.

Part 1	Is Jeffrey describing the recursive or functional relationship?

					Jeffrey's Description	Recursive or Functional
1)	x	1			4	The pattern goes up by 3 each time.	
	y	5		11			
2)	x	10	20			...m number is multiplied by 10	
	y	100	200	3...			
3)	x	1	2	3	4	...m nu... ...ultiplied by 4 an... 1 is...	
	y	5	9	13	17		
4)	x	1	2	3	4	The patte...	
	y	8	12	16	20		
5)	x	1	2	3	4	$7x + 11$	
	y	18	25	32	39		

Part 2	Provide a recursive and functional description of the patterns

	Pattern						
1)	x	1	2	3	4	Recursive	
	y	3	9	15	21	Functional	

	Pattern						
2)	x	1	2	3	4	Recursive	
	y	12	20	28	36	Functional	

Functions - 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 independent and dependent variable. To do this, we look across the table from the term number to the term value.

Tip: To find the function, determine how many is added from one term value to the next. Try using this number as multiplication in your expression. If it doesn't work, you may need to add or subtract to find the function.

Practice finding the function by determining the pattern between the variables

Term Number	Term Value
1	3
2	6
3	9
4	12
5	15
8	

Term Number	Term Value
1	1
2	
3	5
4	
5	
9	

Term Number	Term Value
1	4
2	5
3	6
4	7
5	8

3n

2n-1

Term Number	Term Value
1	3
2	5
3	7
4	9
5	11
9	

Term Number	Term Value
1	4
2	7
3	10
4	13
5	16
10	

Term Number	Term Value
1	16
2	22
3	28
4	34
5	40
11	

_____ _____ _____

Pattern Rule - Input/Output Tables

Questions — Use the function to fill in the table

In n	Out $2n$
1	2
2	4
3	
5	

In n	Out $2n + 5$
1	
2	
3	
4	
5	

In n	Out $5n - 2$
1	
2	
3	
4	
5	

In x	Out $2x - 3$
10	
20	
30	
40	
50	

In x	Out
4	
6	
8	
10	

In x	Out $4x + 8$
1	
3	

In p	Out $2p + 10$
20	
40	
60	
80	
100	

In p	Out $10p - 8$
3	
6	
9	
12	
15	

In p	Out $5p - 20$
5	
10	
15	
20	
25	

Growing Pattern Challenge

Questions | Answer the question below using a table of values and a graph

Joel has created a pattern using his blocks. Translate the pattern using the table of values and graph.
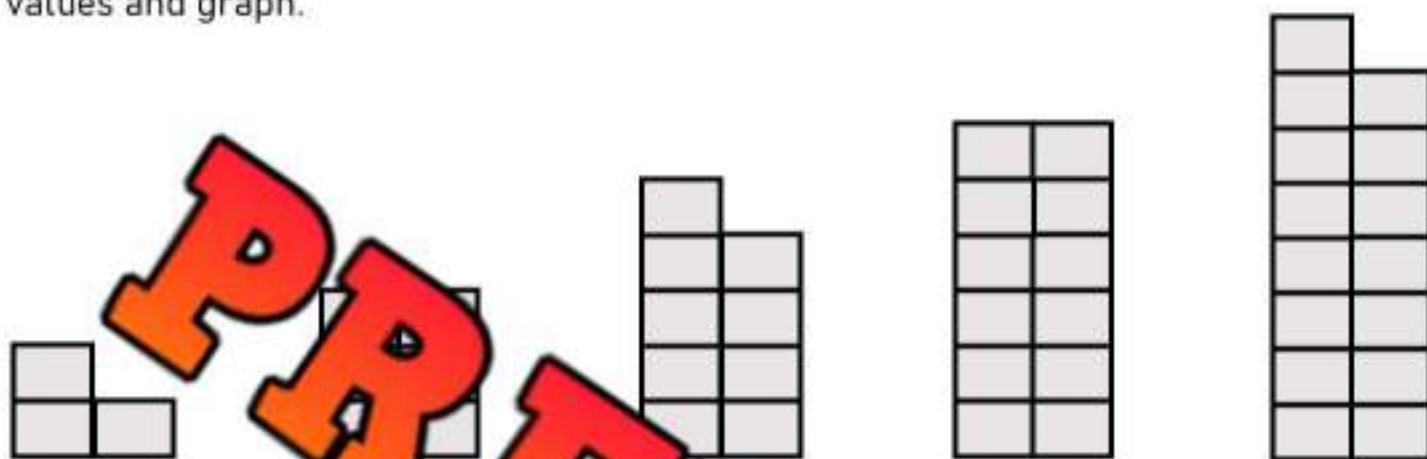
Term Number	Term Value
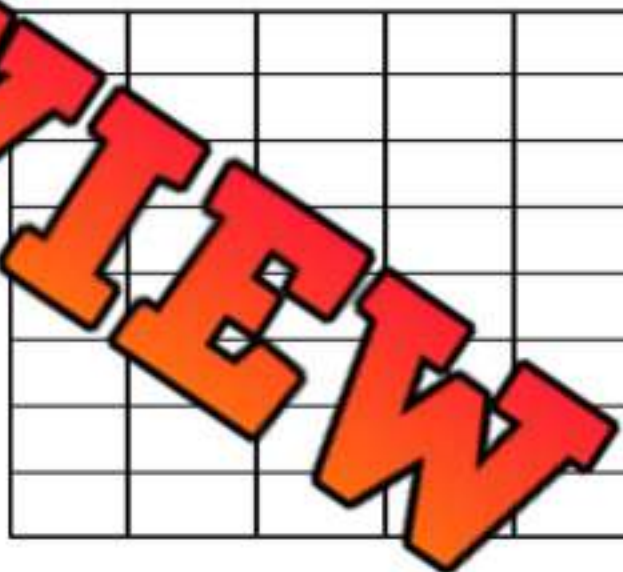
1) How many blocks would Joel use in his 10th shape if he continued his pattern?

2) Write an expression that represents the function

3) Which shape would use 63 blocks?

Picnic 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.
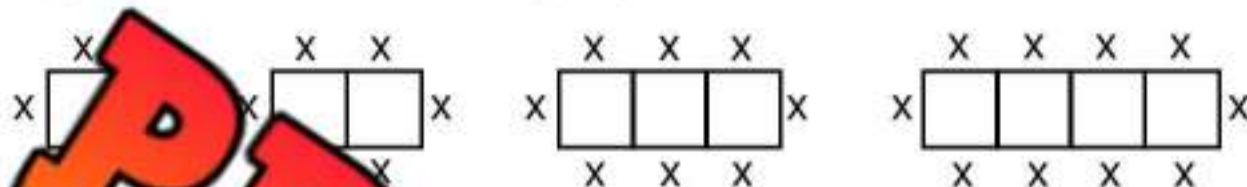
a) Fill in the t[able] ... [about] the pattern of how many people can attend the banquet.

Tables			3	4	5
# of Seats					

b) Write an algebraic expression that represe[nts] [the path] ...

c) How many people could you seat if you had...

    i) 10 tables: _____

    ii) 15 tables: _____

d) What if you didn't put the tables together? Would 8 tables together fit more or less than 8 tables apart?

Patterning - Growing Baby

| Challenge | Answer the question below. Show your thinking! |

A baby grows much faster than an adult. Babies can gain 3 grams of weight every hour!

a) If a baby was born weighing 4000 grams, how much would it weigh after 5 days?
Write _____ le of values.

b) Write an algebraic expression that repre_____ the p_____

c) How much would it weigh in kilograms after 10 days?
Remember, 1000g = 1kg

Finding Term N - Word Problems

Word Problem	Use a table of values and find the nth term

Colton has been saving money since he was 5 years old. He is now 15. He saved $25 when he was 1, $45 when he was 2, $65 when he was 3 and $85 when he was 4.

a) Write a table of values to represent the situation.

b) Write an algebraic ex_____ tha_____ ts the function.

c) How much will he save when he is 10?

d) How much will he save when he is 20?

Finding Term N - Word Problems

Word Problem | Use a table of values and find the nth term

Becky is ramping up her exercise each week. In week 1, she exercised 60 minutes. In week 2, she exercised 110 minutes. In week 3, she exercised 160 minutes. In week 4, she exercised 210 minutes.

a) Write a table of values to represent the situation.

b) Write an algebraic expression that represents the function.

c) If the pattern continues...
   i) How much will she exercise in week 10?

   ii) How much will she exercise in week 30?

   iii) How much will she exercise in one year? (week 52)

T-Tables - Finding Patterns

Fill in the T-Tables by counting the lines in each figure

1) Figure 1   Figure 2   Figure 3

Algebraic Expression	
Figure	Lines
1	7
2	
3	
5	

2) Figure 1   Figure 2   Figure 3

Algebraic Expression	
Figure	Lines
2	
3	
10	

3) Figure 1   Figure 2   Figure 3
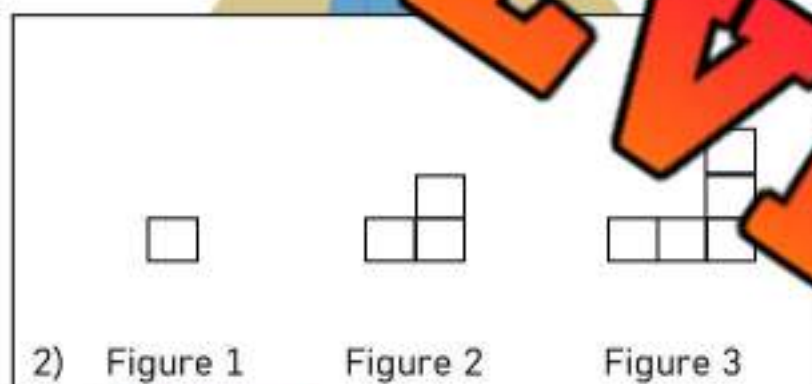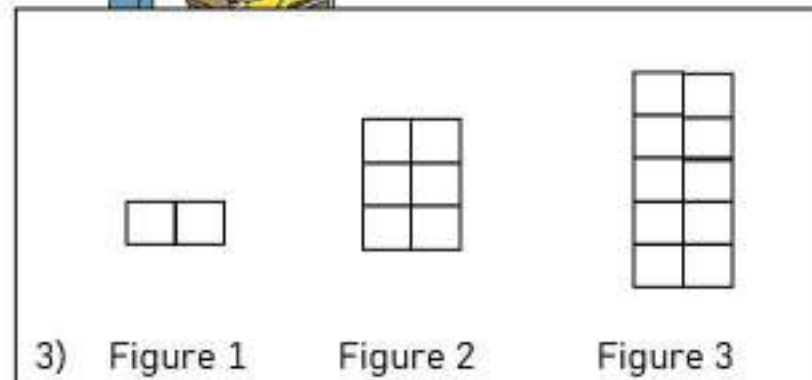
Algebraic Expression	
Figure	Lines
1	
2	
3	
10	

T-Tables - Finding Patterns

Questions	Fill in the T-Tables by counting the lines in each figure

1)   Figure 1   Figure 2   Figure 3

Algebraic Expression	
Figure	**Lines**
1	
2	
3	
5	
8	
	94

2)   Figure 1   Figure 2   Figure 3

Algebraic Expression	
Figure	**Lines**
1	
2	
3	
	52
	100
	112
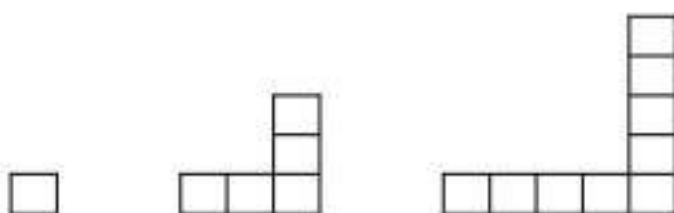
T-Tables - Drawing Blocks

Questions | Fill in the T-Tables and draw figure 4

1) Figure 1   Figure 2   Figure 3   Figure 4

Algebraic Expression	
Figure	**Lines**
1	
2	
3	
4	
	46
	118

2) Figure 1   Figure 2   Figure 3   Figure 4
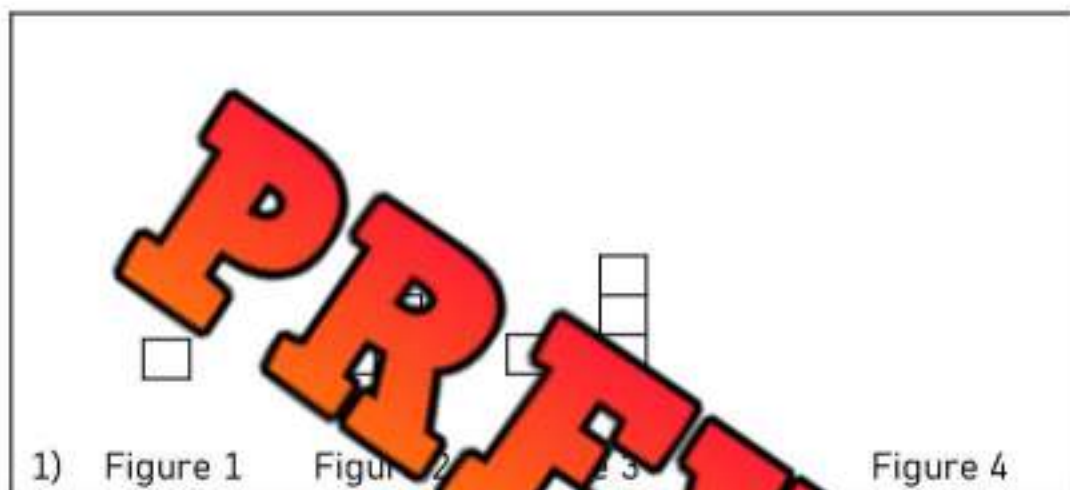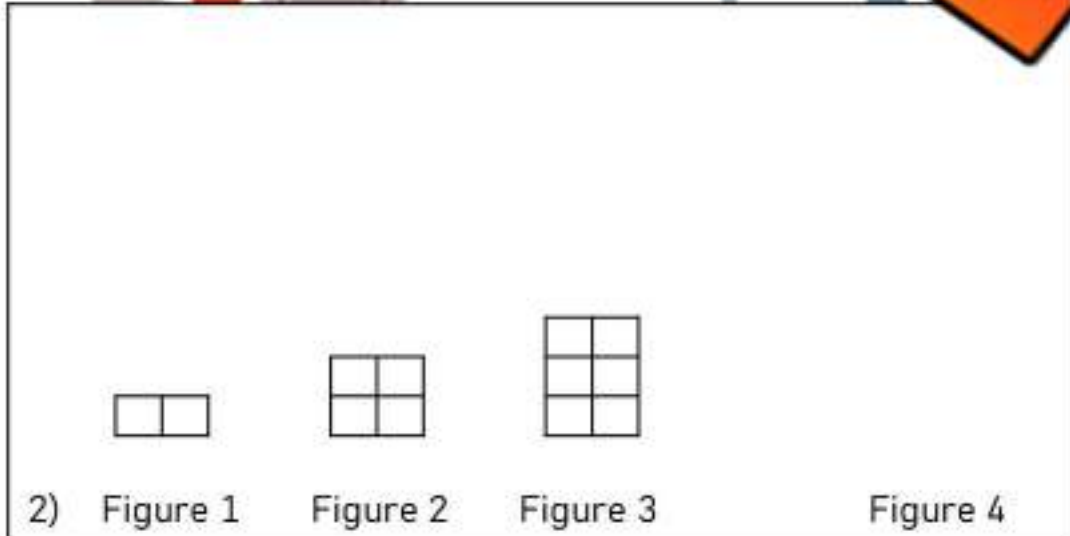
Algebraic Expression	
Figure	**Lines**
1	
2	
3	
4	
	47
	77

Basketball Skills Challenge

Questions | Complete the table of values and graph the results

Connor is practicing his shooting skills in basketball. He decides to take 225 shots each day for 10 days.

Term Number (Days)	1	2	3	4	5	6	7	8	9	10
Term Value (Shots)										

...tion – ...ic Expression	
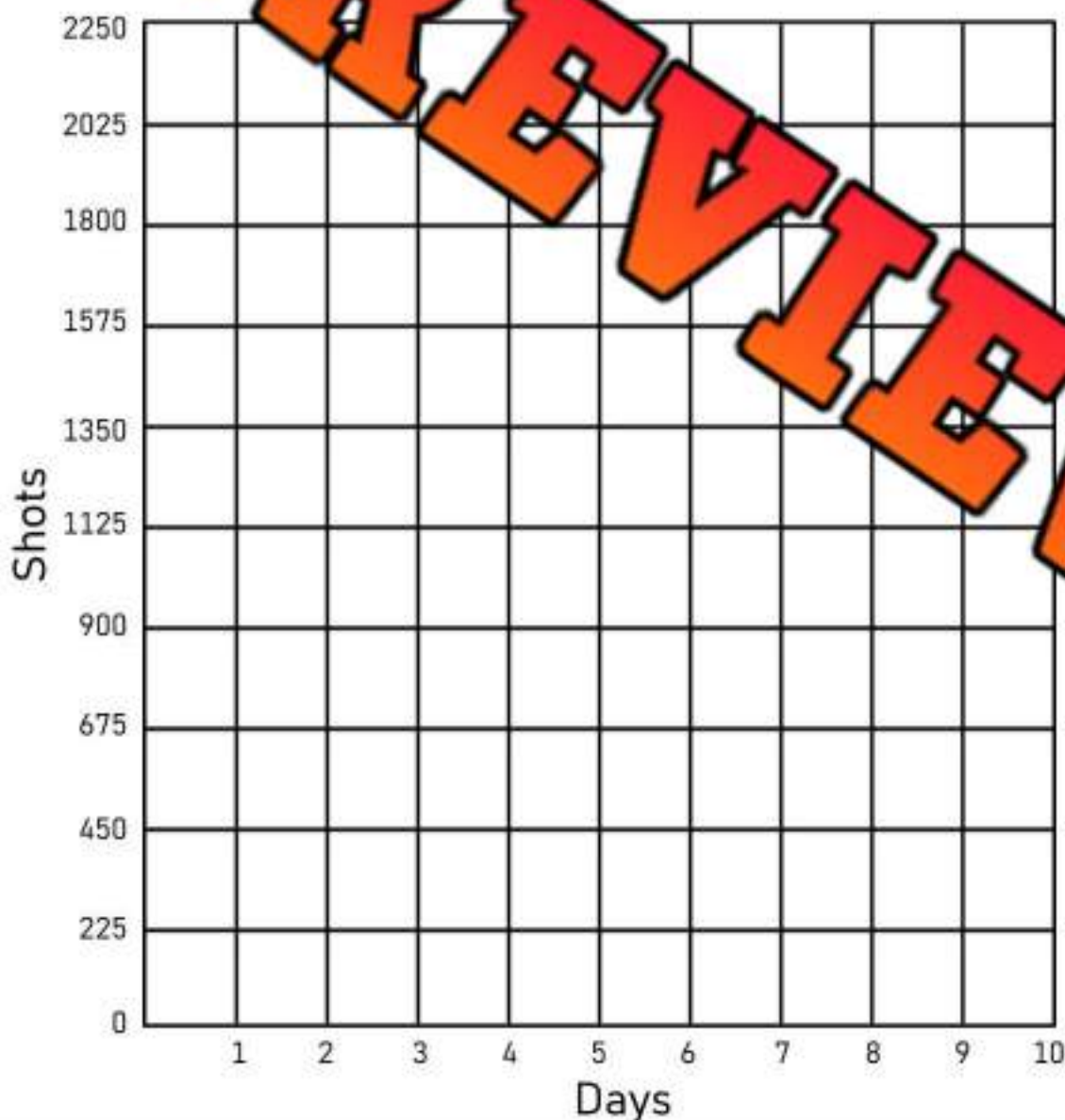
Questions

1. Which day did Connor finish 1500 shots?

_____

2. How many shots did Connor take in ... days?

_____

3. ... friend took 30... shots for 7 days, who would have taken more? Explain.

_____

_____

Saving Money

| Questions | Complete the table of values and graph the results |

Jesse is saving her pay cheques from work each week for 10 weeks. She makes $450 each week. She is hoping she can buy a new bike for $4 000. Fill in the table below to find out.

Term Number (Weeks)	1	2	3	4	5	6	7	8	9	10
Term Value (Money)										

Equation / Algebraic Expression
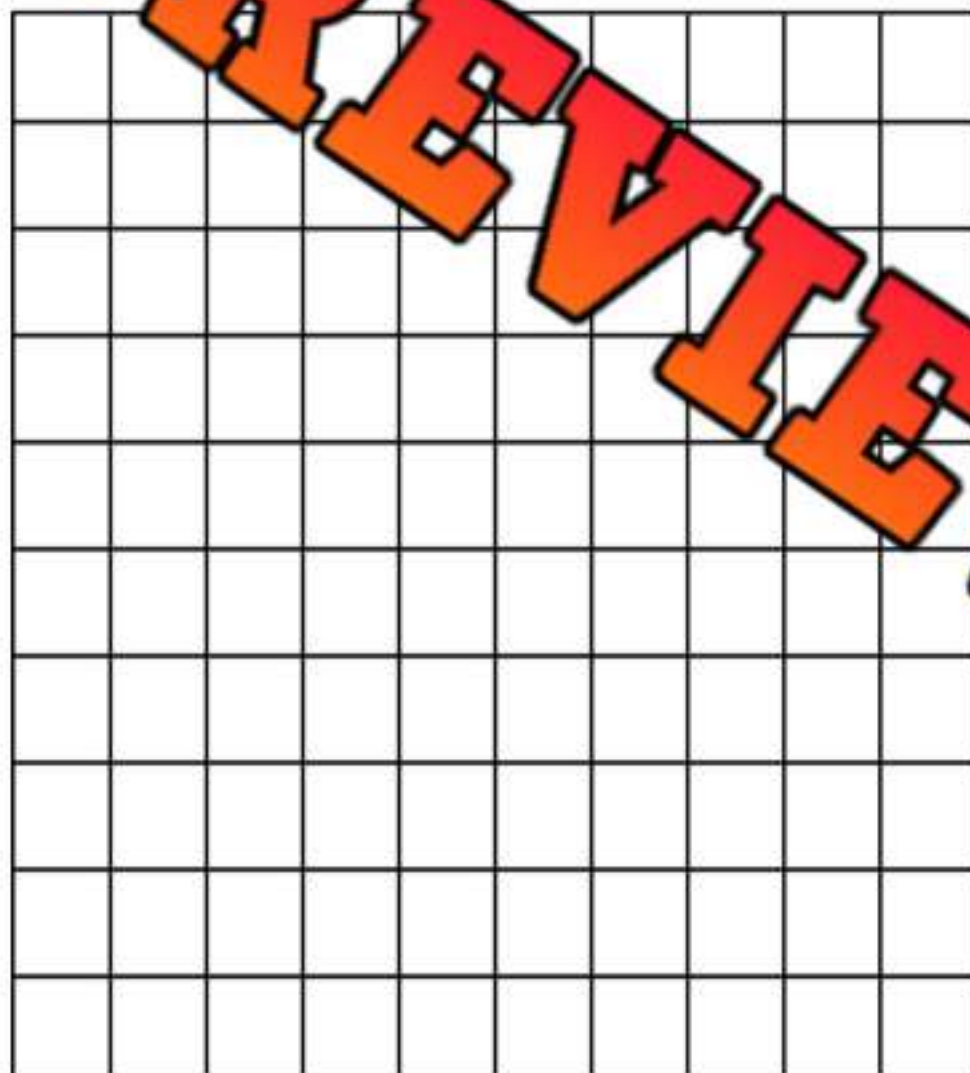
Questions

1. Can Jesse buy her new bike after week 10?

_____

2. How much did she save in 10 weeks?

_____

3. [...] saved, how many weeks would she need to save $6750.

_____

4. How much money would she have after 13 weeks?

_____

Patterning Word Problems - Blocks

Challenge | Answer the problems below

Matt is building a structure using blocks. The construction of his structure will be completed in 5 phases.

a) Matt decided to add the same number of blocks during each of the 5 phases. He has 3 different design ideas. Fill in the tables below.

Phases	Blocks
1	
2	
3	
4	22
5	

Phases	Blocks
1	
2	12
3	
4	
5	

Phases	Blocks
1	8
2	
3	
4	
5	36

b) Whoops, Matt made a mistake when he completed his table. His structure was supposed to add the same number of blocks during each phase. Find his error and correct it.

Phases	1	2	3	4	5
Blocks	13	18	21		

c) You want to build a house out of blocks, but each block costs $6. You have created 4 different design plans. You have $70 to spend. Which design will you choose?
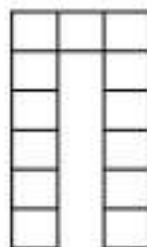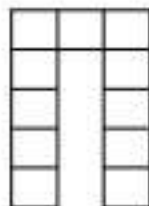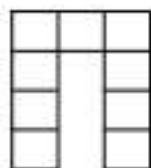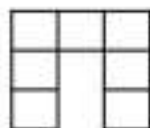
Design	Blocks	$
1		
2		
3		
4		

_____

_____

Unit Test - Patterning

Part 1	Translate the increasing pattern into a table of values and a graph

Fill in the table of values and the graph by translating the growing pattern below.
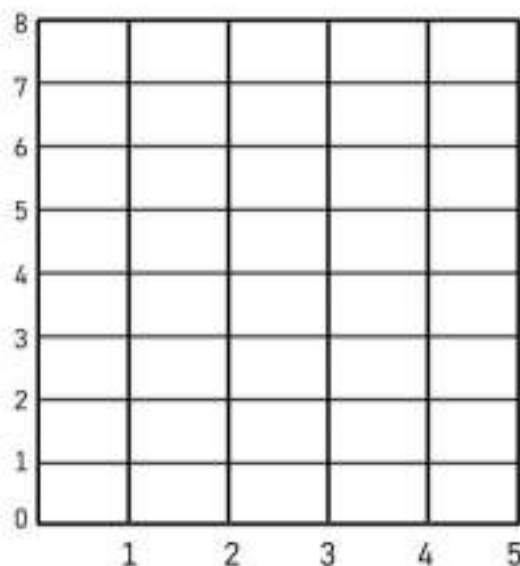
Term Number	1			5	8
Term Value					

Pattern rule:

_____

1) How many circles would term 20 have?	
2) Which term number will use 100 circles?	
3) Why is this graph a straight line?	

Term Number	Term Value
1	4
2	5
3	6
4	7
5	
9	

Term Number	Term Value
1	3
2	6
3	9
4	12
5	
20	

Term Number	Term Value
1	4
2	9
3	14
4	19
5	
50	

_____

_____

Part 3 — Answer the questions below about the pattern. Draw the 4th figure

Draw Figure 4
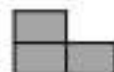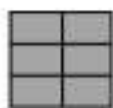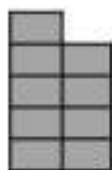
Figure 1   Figure 2   Figure 3   Figure 4

Figure	Term Value
1	

1) What is the pattern rule? Start at ____, _____ each time.

2) How many rectangles would figure 25 have?

3) Write an expression that represents the pattern

Steven has $20 in his bank account. He earns $10 for every lawn he mows.

a) How much money does he have after mowing one lawn?

b) How much money does he have after mowing two lawns?

c) W_____ o_____ that represents the number of lawns he cuts and his ear_____gs.

d) Write an algebraic expression that repre_____ the f_____

e) After cutting 20 lawns, how much money will Steven have?

f) How much will he have after cutting 52 lawns?

Equation or Expression?

Questions	Is the number sentence an expression or equation?

1) Paul has 20 cookies but needs 30 for his class. $20 + c = 30$	Equation	Expression
2) The pa̶c̶ has the following function: $3n - 1$	Equation	Expression
3) Mar̶ wants t̶ this week. She has already run 22km. 22 +	Equation	Expression
4) The cost to enter an ̶ t pa̶ per ticket. 25t	Equation	Expression
5) Jeff works at a garden centre and earns $18̶ our. He can figure out his pay by using the follo̶ 18h	̶ion	Expression
6) Bailey made $400 last week working with her mom. She worked 20 hours. $20 \times w = 400$	E̶	̶ion
7) Jane had 200 candies to give away on Halloween. She has 25 left. $200 - c = 25$	Equation	Expression
8) Ashley had 300 candies to give away on Halloween. She will give 3 candies to each kid. How many kids can she give candy to? $300 \div 3 = k$	Equation	Expression
9) Candy bags come in 20 packs. The total number of candies is represented below: 20b	Equation	Expression

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* x 10

Part 1	Write each algebraic expression in words. Use the words, "a number" in place of the variable

1) 9 – *t*

Nine subtr_____ ber

2) *n* + _

3) 6 + *b*

4) 12*r*

5) $\frac{y}{8}$ + 5

Part 2	Write an algebraic expression for each st____er

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

Algebraic Expression - Terms

An **expression** is simply numbers and at least one operation put together without an equal sign. For example, 8 + 2 is an expression.

    An **algebraic expression** is when we use a variable in an expression. The **variable** represents an unknown value. We use algebraic expressions to help us solve mathematical situations.

For example: if you were selling lemonade for \$2, you could use the following algebraic expression where the variable c represents cups sold: $2c$

In an algebraic expression, we have at least one term. A term could be a constant and/or a variable. It could also include a coefficient.

4 terms

$$7n + 2y - 3 + 5$$

coefficient   variable   constant   coefficients   variables   constants

Terms	Definition
Variable	An unknown value that is represented by a letter. We use a letter because the value could change
Constant	A number on its own. It does not change. It does not include any variables. Therefore, the number is constant
Coefficient	A number used to multiply a variable
Term	Is either a single number or a variable, or numbers and variables multiplied together

Questions   Answer the questions below about the expression provided

Expression	$5n - 3y - 8 + 4$
List the variables	
List the constants	
List the coefficients	
How many terms are there?	

Writing Algebraic Expressions - Treats

A mathematical expression is similar to an equation, but it does not have an equal sign. We use expressions to describe a mathematical situation.

Questions | Write the expressions for the situations below

1) Lindsay has *y* amount of cookies. She gives 32 cookies away to the students in her class.

Expression: _____ 32

2) Courtn____ brownies into *b* pieces. She eats 2 brownies.

Expre____

3) Alyse make____ to ____ equally with her 4 friends.

Expression:

4) Hani gives 2 freezies t____ his f____ of friends.

Expression:

5) Scott has 11 sodas in his fridge and____ys *s* m____ odas

Expression:

6) Dan buys 2 dozen donuts and eats *d* number of d____ brea____

Expression:

7) Steve buys *x* number of cookies and gives 15 to his staff.

Expression:

8) Alexa has 35 suckers that she shares equally with her *f* number of friends.

Expression:

9) Brian has 200 gummy worms and takes *n* number of gummies from his brother.

Expression:

10) Howard gives 3 books each to *s* number of students.

Expression:

Evaluating Algebraic Expressions

Part 1	Evaluate the following expressions for $x = 4$

1) $x + 16$	2) $10x$	3) $63 - x$	4) $x \div 2$
5) $16 \div$	6) $12x$	7) $4x - x$	8) $12 \div x + 8$

Part 2	Evaluate the following expressions for $y = 7$ and $n = 5$

1) $y - n + 22$	2)	$- y + n$	4) $y \div 7 + n$
5) $35 \div y + 5$	6) $11n - y$	7)	$60 \div n + y$

Part 3	Evaluate the following expressions for $x = 9$ and $p =$

1) $x + p - 10$	2) $10x + (2p)$	3) $54 \div x - p$	4) $x + 9 + (3p)$
5) $18 \div x + (5p)$	6) $9x - (18 - p)$	7) $6x - 5p$	8) $8p + 3x$

Evaluating Algebraic Expressions

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 = 2
2 + (
2
2 +
24

Example 2 $y = 5$
$y - (1 + 2)$
$5 - (1 + 2)$
$5 - 3$

Example 3 $y = 3$
$10 - 3 \times y$
$10 - 3 \times 3$
$10 - 9$
1

Part 1   Evaluate ... wing ... ions for $x = 4$

1) $x + 15 - 3$	2) $4 +$	3) $42 - 2x$
4) $4 \times 9 \div x$	5) $11x - (5 + 5)$	x

Part 2   Evaluate the following expressions for $y = 6$

1) $y + 7 - 2 \times 5$	2) $6 + 7y - 4$	3) $100 - 2y \times 2$

Order of Operations – Who's Right?

Questions | Ben and Dan both answered the questions below. Circle who's right

	Question	Ben's Answer	Dan's Answer
1	$y = 3$ $2 + (y + 5)$	10	8
2	$y = 2$ _____	10	0
3	$y = 2$ _____	15	11
4	$y = 6$ $3y + 5$	23	33
5	$y = 8$ $y - 4 \div 2$	2	
6	$y = 4$ $y + (8 - 3) \times 2$	14	18
7	$y = 7$ $y - 2 \times (5 - 2)$	15	23
8	$y = 20$ $100 \div (5 + y)$	40	4

Writing Expressions

Part 1   Write your own expressions using y = 6 and evaluate them

1)	2)
3)	4)

Part 2   Write you~~r own expres~~ ~~sing~~ p = 4 and evaluate them

1)	2)
3)	4)

Part 3   Write your own expressions using the numbers 5, 10, and variable *t* = 5

1)	2)

Evaluating Algebraic Expressions

Part 1   Evaluate the following expressions for *x* = 4

1) $x + 16$ _____	2) $10x$ _____	3) $63 - x$ _____	4) $x \div 2$ _____
5) $16 \div$	6) $12x$	7) $4x - x$ _____	8) $12 \div x + 8$ _____

Part 2   Evaluate the following expressions for *y* = 7 and *n* = 5

1) $y - n + 22$ _____	2)	$78 - y + n$ _____	4) $y \div 7 + n$ _____
5) $35 \div y + 5$ _____	6) $11n - y$	$+ 15$	8) $60 \div n + y$

Part 3   Evaluate the following expressions for *x* = 9 and

1) $x + p - 10$ _____	2) $10x + (2p)$ _____	3) $54 \div x - p$ _____	4) $x + 9 + (3p)$ _____
5) $18 \div x + (5p)$ _____	6) $9x - (18 - p)$ _____	7) $6x - 5p$ _____	8) $8p + 3x$ _____

Writing Expressions

There are an endless number of expressions that represent the same number. For example, both of the expressions below equal 10

when y = 5			
Equation 1	y + 5	**Equation 2**	4y – 10

Part 1 ___ different expressions that represent the number 8. Use *y = 3*

1)	2)
3)	

Part 2 Write four different expressions using ___ one op___ that represent the number 6. Use y = 10

1)	2)
3)	4)

Addition - Are They Equal?

Are the equations equal? Put a slash through the equal sign for any equations that are not equal.

$$8 + 4 = 12 \qquad 23 + 15 \neq 36 \qquad 47 + 13 = 50$$

Questions | Put a slash through the equal sign if it is not balanced

	2) 43 + 10 = 63	3) 41 + 13 = 55
4) 58 + 12 =	5) ___ 13 = 77	6) 82 + 15 = 98
7) 92 + 5 = 97	8) 1__ 13 =	9) 114 + 7 = 122
10) 125 + 15 = 150	11) 137 + 11 = 147	12) ___ 158
13) 12 + 144 = 158	14) 171 + 14 = 185	15) 166 + 20 = 186
16) 192 + 8 = 200	17) 180 + 13 = 193	18) 155 + 26 = 181
19) 210 + 50 = 250	20) 212 + 12 = 224	21) 255 + 40 = 285

Pre-Algebra - Balancing Addition Equations

Balancing equations means both sides of the equal sign must be the same.

Examples:

$\overset{52}{\wedge}$

$37 + 15 = \boxed{52}$

$\overset{78}{\wedge}$

$46 + 32 = \boxed{78}$

| **Questions** | **Fill in the missing number to balance the equation** |

1) 44 ___

2) $53 + 9 = \boxed{}$

3) $67 + 12 = \boxed{}$

4) $15 + \boxed{} = $ ___

5) ___ $= 57$

6) $68 + \boxed{} = 81$

7) $\boxed{} + 12 = 95$

8) ___ $+ 25 = $

9) $\boxed{} + 59 = 66$

10) $72 + 14 = \boxed{}$

11) $64 + \boxed{} = 80$

12) ___ $= 65$

13) $68 + \boxed{} = 82$

14) $83 + 15 = \boxed{}$

15) $89 + \boxed{} = 102$

16) $105 + \boxed{} = 116$

17) $121 + 14 = \boxed{}$

18) $145 + \boxed{} = 160$

19) $177 + \boxed{} = 198$

20) $215 + 41 = \boxed{}$

21) $217 + \boxed{} = 229$

Addition - Find the Variable

A **variable** is a letter that represents an unknown number. When we don't know a number, we can use a letter to take the place of the unknown number.

Example: 15 + n = 35

We can figure out the unknown number by balancing the equation. In this equation, n = 20.

⊜

| Part 1 | Find out the value of the variable |

	n + 13 = 20	27 + n = 35
n =	n =	n =
41 +	36 + p = 51	p + 48 = 79
p =		p =
85 + y = 101	y	124 + 15 = y
y =		y =
165 + t = 181	190 + t = 2	205 + t = 220
t =	t =	t =
231 + a = 245	256 + a = 271	2 a = 85
a =	a =	
281 + 9 = s	290 + n = 300	s + 300
s =	s =	s =

| Part 2 | The formula for calculating the perimeter of a shape is to add the side lengths |

Find the perimeter with the measurements given for the 3 side lengths.

1) a=4 b=7 c=10	P=	4) a=12 b=25 c=30	P=
2) a=7 b=12 c=16	P=	5) a=19 b=31 c=45	P=
3) a=9 b=17 c=23	P=	6) a=15 b=23 c=36	P=
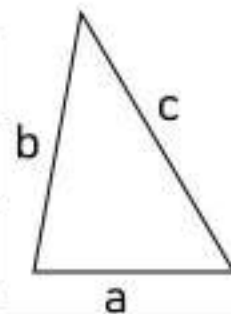
Adding Decimals - Solve the Variable

Practice   Find the value of the variables below

1) 3.5 + n = 5 n =	2) n + 2.5 = 5 n =	3) s + 3.7 = 4 s =
4) 5 = p	5) 8.2 + p = 10 p =	6) 9.1 + r = 10.5 r =
7) 14.7 n =	n + 16.5 = 18.5 n =	9) t + 11.4 = 15 t =
10) 22.2 + n = 23.1 n =	t	12) 31.6 + 5 = p p =
13) 42.6 + n = 44.1 n =	14) 52.8 + 5.2 n =	3.4 + s = 68.5
16) 77.5 + s = 81.5 s =	17) 85.4 + 2.2 = s s =	18) n

Word Problems   Solve the questions below

1) Jake has 2.5 pizzas left over from last night. His friend brings over some more pizza. They now have 4.5 pizzas. How much pizza did his friend bring?

2) Kelly is 1.2 meters tall. She hopes to grow to be 1.7 metres tall. How much will she have to grow?

Equation Pairs - Addition

When we add numbers or variables (letters) together, we can change the order of the numbers/letters without affecting the answer. This is called the **communitive property**.

Directions: Isaac works at a fast-food truck. He sells burgers (b) and fries (f). His job is to calculate how much the customer owes in total (t) for their order.

Question			Write 2 equations for the orders below	
#	Fries	Burger	**Equation 1** (f + b = t)	**Equation 2** (b + f = t)
1	3	8	3 + 8 = 11	8 + 3 = 11
2	5			
3	3	6		
4	7	8		
5	5	9		
6	7	6		
7	3	4		
8	5	7		
9	7	9		
10	5	8		

Addition Equations - Perimeter of a Rectangle

When we calculate the perimeter of a rectangle, we need to add all the sides together. The order of how we decide to add the sides together will not affect the answer due to the communitive property of addition.

Formula 1 – p = a + b + a + b
  p = 12 + 4 + 12 + 4
  p = 32

a = 12cm

b = 4cm

Formula 2
p = 2(a + b)
p = 2 x (12 + 4) = 32

Part 1	Write 2 equations for the side lengths below

#	Side length A	Side Length B	Equation 1	Equation 2
1	7			
2	5			
3	9			
4	11			
5	13	16		
6	20	17		
7	17	11		
8	22	14		
9	19	22		
10	27	14		

Part 2	Using multiplication and addition, write two equations for the side lengths

#	Side length A	Side Length B	Equation 1	Equation 2
1	7	3	2(7 + 3) = 20	2(3 + 7) = 20
2	5	4		
3	9	5		
4	6	8		

Writing Addition Equations - Candy Shop

Alice works at a candy shop. She sells suckers (s), gum (g), and chocolate bars (b). Her job is to calculate how much their order costs (c).

Questions   Write the equation and find the answer
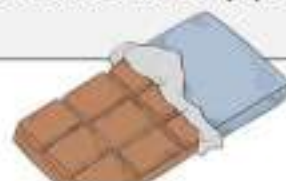
#	Customers Order ($)	Equation	Answer
1	b = 8 s = 9	c = g + b + s c = 5 + 8 + 9	22
2	g = 1		
3	g = 7 s = 1		
4	g = 9 b = 8 s = 5		
5	b = 15 s = 12		
6	g = 31 b = 16		
7	g = 24 b = 18 s = 16		
8	g = 38 s = 24		

Word Problems - Writing Addition Equations

Questions | Answer the questions below

1) Alex and Ryan had 37 points together in a basketball game. Ryan had 21 points. Which equation will tell us how many points Alex had?

$a + 21 = 37$	$37 + 21 = a$
$21 + a = 37$	$21 - a = 37$

2) Bruce _____ _____ $75 together at work. Bruce can't remember how much he made _____ _____ kn_____ _____ ade $39. Which equation will tell us how much Bruce made?

_____ + 39	$39 + b = 75$
	$75 + 39 = b$

3) Mary and Brianna found 12___ _____ter _____ _____ Mary found 65. Which equation will tell us how many Brianna found?

$121 + b = 65$	65 + _____
$b + 65 = 121$	___ = 65

4) Brad scored 38 points in a basketball game. He had 12 p___nts _____ Which equation will tell us how many points he had in the secon___ _____

$p + 38 = 12$	$38 + 12 = p$
$38 + p = 12$	$12 + p = 38$

5) It snowed 31cm in two days. The first day it snowed 14cm. Which equation will tell us how much it snowed the second day?

$s + 14 = 31$	$31 + 14 = s$
$14 + s = 31$	$31 + s = 14$

Word Problems - Solving Addition Equations

Questions	Write the algebraic equations and answer the question

1) Luna drove 321km to get to a friend's house and then they drove to the mall. When they got to the mall, she had driven 418 km in total. How many km did she drive to the mall (m)?

2) Carter g____ 5 points for beating level 1 in a video game. He got 238 more points for beatin____. How many total points (t) did he have after level 2?

Bonus – __e had ____int____ after beating level 3. How many points did he get in level 3 (L)?

3) The Lakers scored 122 t____ ts i____ ainst the Toronto Raptors. Kobe Bryant had 81 points for the La____rs. H____ po____ (p) did the rest of the team have?

4) Wyatt's boat can hold 500 litres of gas. He went out bo____ g o____ n he docked the boat after he was done, the tank had 128 litres left. ____ (L) did he use?

5) Leo had $736 in his bank account. He deposited some more money after gardening for a summer. Now he has $980. How much money (m) did he make gardening?

Solving Addition Equations - Shopping Trip

Questions | Solve the problems below. The first one is done for you

1) Jan spent *x* amount of dollars on new clothes at the mall. She bought jeans (j) for $79, a shirt (s) for $35, and a hat (h) for $49. Find the value of x.

Equation : <u>x = j + s + h</u>

<u>x = 79 + 35 + 49</u>

<u>x = $163</u>   Therefore, <u>Jan spent $163</u>.

2) Aiden _____ pet store. He bought dog food (f) for $78 and bones (*b*) for $49. He also b_____ ___ (t) for $62. How much did he spend (s)?

Equation : _____

_____

_____ ____efore _____

3) Josiah spent $830 total (t) ___ spo_____ ___re. He bought new skates (s) for $475, new gloves (g) for $190, and a _____ for ___ ___ber of dollars. How much is *n* worth?

Equation : _____

_____

_____ Therefore, _____

4) Barry bought 4 new t-shirts (s) that all cost the same amoun____ ___ ____otal (t) price of $208. How much is *s* worth?

Equation : _____ = _____ + _____ + _____ + _____

_____

_____ Therefore, _____

5) Henry bought a new computer setup for a total (t) of $999. He bought a computer for c number of dollars. He also bought a keyboard (k) for $82 and a mouse (m) for $58. How much is c worth?

Equation : _____

_____

_____ Therefore, _____

Subtraction - Are They Equal?

Are the equations equal? Put a slash through the equal sign for any equations that are not equal

16 – 8 = 8   95 – 11 ≠ 86   105 – 12 = 93

| Questions | Put a slash through the equal sign if it is not balanced |

1) ??	2) 46 – 4 = 42	3) 57 – 6 = 51
4) 68 – 10 ??	?? – 7 = 57	6) 75 – 13 = 63
7) 84 – 14 = 70	8) ?? ?? = ??	9) 108 – 12 = 95
10) 135 – 15 = 110	11) 126 – 20 = 1??	12) ?? – 8 = 144
13) 168 – 22 = 144	14) 174 – 13 = 161	15) 15? – 16 = 142
16) 189 – 0 = 0	17) 192 – 11 = 180	18) 181 – 15 = 166
19) 195 – 30 = 165	20) 197 – 16 = 182	21) 171 – 26 = 155

Pre-Algebra - Balancing Subtraction Equations

Balancing equations means both sides of the equal sign must be the same.

Examples

$$54 - 6 = \boxed{48}$$

with 48 shown above

$$72 - \boxed{15} = 57$$

with 57 shown above

Questions	Fill in the missing number to balance the equation

1) 36 – [PREVIEW]

2) 53 – 7 = ☐

3) 44 – 5 = ☐

4) 58 – ☐ = [PREVIEW]

5) [PREVIEW] = 39

6) 65 – ☐ = 55

7) ☐ – 5 = 52

8) [PREVIEW] = 64

9) ☐ – 7 = 71

10) 83 – 11 = ☐

11) 91 – ☐ = 75

12) [PREVIEW] = 67

13) 105 – ☐ = 99

14) 112 – 9 = ☐

15) 122 – ☐ = 111

16) 132 – ☐ = 119

17) 146 – 15 = ☐

18) 158 – ☐ = 136

19) 173 – ☐ = 164

20) 185 – 17 = ☐

21) 197 – ☐ = 182

Subtraction – Find the Variable

A **variable** is a letter that represents an unknown number. When we don't know a number, we can use a letter to take the place of the unknown number.

Example: 39 – n = 25

We can figure out the unknown number by balancing the equation. In this equation, n = 14.

Question	Find out the value of the variable

1) ___ ___ n =	2) n – 15 = 20 n =	3) 47 – n = 35 n =
4) 68 – ___ p =	___ 74 – p = 53	6) p – 16 = 50 p =
7) 76 – y = 61 y =	8) ___ y =	9) 92 – 13 = y y =
10) 105 – t = 91 t =	11) 114 – ___ ___ t =	___ 1 – t = 119 ___
13) 153 – a = 137 a =	14) 168 – a = 145 a =	15) ___ 75 ___

Part 2	Calculate the change a customer gets when they buy something

When a customer buys something, the formula for calculating their change (c) is money given (m) subtract the price (p) of the item. Therefore, c = m – p

m = 20 p = 15	c = 20 – 15	c = 5	m = 60 p = 51	c = ___ – ___	c =
m = 30 p = 19	c = ___ – ___	c =	m = 100 p = 77	c = ___ – ___	c =
m = 50 p = 27	c = ___ – ___	c =	m = 100 p = 61	c = ___ – ___	c =

Using Variables to Solve Subtraction Equations

There are some instances where we know the values of variables and need to plug them into an equation. For example:

$$a - b = c \qquad a = 32 \qquad b = 12$$
$$32 - 12 = c$$
$$c = 20$$

Question	Find out the value of the variable

a – ___ = ___ b = 11 _____ – _____ = ___ c =	e – n = f e = 36 n = 9 _____ – _____ = f f =
r – y = k r = ___ ___ _____ – _____ = k k =	___ – g = h t = 65 g = 16 _____ – _____ = h ___ =
a – b = c a = 71 b = 13 _____ – _____ = c c =	e – ___ f ___ 75 n = 18 _____ – _____ f =
r – y = k r = 81 y = 16 _____ – _____ = k k =	t – g = h t = ___ _____ – _____ = h h =
a – b = c a = 108 b = 11 _____ – _____ = c c =	e – n = f e = 125 n = 22 _____ – _____ = f f =
r – y = k r = 138 y = 31 _____ – _____ = k k =	t – g = h t = 164 g = 43 _____ – _____ = h h =

Subtracting Decimals - Solve the Variable

Practice | Find the value of the variables below

1) 6.5 – n = 3
   n =

2) n – 2.5 = 4
   n =

3) s – 3.2 = 2
   s =

4) ___ = p

5) 9.1 – p = 7
   p =

6) 12.1 – r = 10.5
   r =

7) 16.3 ___
   n =

8) n – 3.5 = 11.5
   n =

9) t – 4.4 = 15
   t =

10) 22.7 – n = 20.1
    n =

11) ___

12) 34.6 – 6 = p
    p =

13) 47.6 – n = 44.4
    n =

14) 58.8 – ___
    n =

15) 67.2 – s = 62.4
    s =

16) 75.5 – s = 71.4
    s =

17) 88.4 – 2.3 = s
    s =

18) ___ n

Word Problems | Solve the questions below

1) Zara has 1.5 birthday cakes leftover from her party. She eats some
   the next morning and now there is only 0.9 of the cake left. How much did she eat?

2) Randy works for 7.5 hours today. He only has 2 hours left to work. How much time
   has elapsed?

Writing Subtraction Equations - Bakery

Alice works at a bakery. Her job is to provide change (c) to customers when they pay for their baked goods (g). She must subtract their order from their payment (p).

Questions	Write the equation and find the answer

#	Payment	Baked Goods	Equation	Answer
1		32	c = p – g c = 50 – 32	c = 18
2	80			
3	100			
4	120	103		
5	100	86		
6	150	94		
7	200	118		
8	150	137		

Word Problems - Writing Subtraction Equations

Questions | Answer the questions below

1) Harry bought 24 donuts. Him and a friend ate 9 of them. Which equation will tell us how many donuts there are left?

d – 9 = 24	24 – 9 = d
d – 24 = 9	24 – d = 9

2) Steph... ...thon challenge. She needs to run 42km in 5 days. It is the last d... ...she sti... ...m left to run. Which equation will tell us how many km she has ... befor... ...day?

42 – ...	8 – r = 42
...8	r – 8 = 42

3) Tom collected 142 shells o... ...bea... ...me to his sister. Now he has 94 shells left. Which equation tells us ho... ...shel... ...gave to his sister?

142 – 94 = s	14... ...
s – 94 = 142	...2 = 94

4) Courtney saved 125 dollars to buy new shoes. She now ... 4... ... equation tells us how much the shoes cost?

s – 45 = 125	125 – 45 = s
45 + s = 125	125 – s = 45

5) The movie is 118 minutes long. They have watched 31 minutes. Which equation tells us how many minutes are left?

m – 31 = 118	118 – 31 = m
31 + m = 118	31 – m = 118

Word Problems - Solving Subtraction Equations

Questions | Write the equation using the variable and then solve the equation

1) Sofia started the weekend with $421 in her bank account. She went shopping (s) at the mall and now has $76. How much did she spend at the mall?

2) Chloe _____ 00m race. She has run 2931m already. How many metres does ____ left ____ race?

3) Michael is driving to an amu____ ent ____ park is 573km away. He will need to stop for gas at the 350km ma____ man____ ill he have left (L) after he stops?

4) Jacob is climbing Mount Everest to Base Camp. It is 5,464m h____ a break with 1,650m left. How many metres has he climbed (c) al____ y____

5) Willow is driving to her cottage in northern Alberta. The total distance is 801km. She has driven 427km already. How much more distance (d) does she need to drive?

Solving Subtraction Equations - Vacation

Questions | Solve the problems below. The first one is done for you

1) Ron is driving 1,350km (x) to a resort with his family. They drive 415km on the first (f) day and 480km on the second (s) day. How many km do they have left (L)?

Equation : $\underline{L = x - f - s}$ or $\underline{x - f - s = L}$

$\underline{L = 1350 - 415 - 480}$

$\underline{L = 455km}$ Therefore, Ron and his family have 455km remaining to drive.

2) They _____ (b) $400 on dinner out for 3 nights. They spent $95 on the first _____ and _____ the second (s) dinner. How much do they have left for the third dinner (t)?

Equation : _____

_____

_____ fore _____

3) The family heads to the water slide _____ $200 in total (t). The two adults (a) cost $48 each. The two kids (k) co_____ each. _____ uch do they have left (L)?

Equation : _____

_____

_____ Therefore, _____

4) The family buys a 50 pack of gummies (g). Ron (r) has 6 and _____ 8. The kids (k) eat 26 together. How many gummies are left (L)?

Equation : _____

_____

_____ Therefore, _____

5) On the drive home, they take a short cut. The drive is 981km (d). They drive 311km the first day (f) and 511km the second (s) day. How many km do they have left (L)?

Equation : _____

_____

_____ Therefore, _____

Multiplication - Are They Equal?

Are the equations equal? Put a slash through the equal sign for any equations that are not equal

$6 \times 3 \neq 16$ $3 \times 8 = 24$ $7 \times 6 \neq 49$

Questions	Put a slash through the equal sign ≠ if it is not balanced

1)	2) $5 \times 4 = 25$	3) $8 \times 3 = 21$
4) $7 \times 5 =$	$\times 2 = 18$	6) $7 \times 4 = 21$
7) $10 \times 3 = 30$	8) $= 4$	9) $9 \times 4 = 38$
10) $9 \times 10 = 90$	11) $2 \times 7 = 16$	1 $\times 4 = 32$
13) $6 \times 4 = 24$	14) $6 \times 6 = 42$	15) $5 \times 9 = 40$
16) $6 \times 7 = 42$	17) $4 \times 9 = 36$	18) $3 \times 10 = 30$
19) $8 \times 7 = 57$	20) $7 \times 7 = 49$	21) $8 \times 4 = 31$

Pre-Algebra - Balancing Multiplication Equations

Balancing equations means both sides of the equal sign must be the same.

Examples:

24
8 x 3 = [24]

42
7 x [6] = 42

Questions | Fill in the missing number to balance the equation

1) 6 x ⬚	2) 5 x 7 = ⬚	3) 4 x 5 = ⬚
4) 8 x ⬚ =	5) ⬚ = 18	6) 4 x ⬚ = 28
7) ⬚ x 5 = 25	8) ⬚ x 6 =	9) ⬚ x 3 = 18
10) 9 x 4 = ⬚	11) 7 x ⬚ = 56	12) ⬚ x 8 = 40
13) 3 x ⬚ = 33	14) 10 x 9 = ⬚	15) 6 x ⬚ = 54
16) 8 x ⬚ = 48	17) 20 x 3 = ⬚	18) 4 x ⬚ = 44
19) 12 x ⬚ = 48	20) 14 x 4 = ⬚	21) 11 x ⬚ = 110

Multiplication - Find the 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 <u>means</u> 7 x n = 14

We can figure out the unknown number by balancing the equation – n = 2.

Question | Find out the value of the variable

1) n =	2) n x 8 = 16 n =	3) s x 6 = 48 s =
4) 10 x 4 p =	= 30	6) 6k = 18 k =
7) 3n = 18 n =	n x n =	9) n x 6 = 66 n =
10) 5n = 25 n =	11) 6 x 4 = t t =	8 x 4 = p
13) 3n = 24 n =	14) 10n = 100 n =	7
16) 9s = 27 s =	17) 5 x 8 = s s =	18) 4 x t =

Part 2 | Calculate the area using the variables for <u>Length</u> and <u>Width</u>

The formula for calculating area is: A = L x W

Calculate the area in the questions below using the values for the variables L and W

L = 5 W = 8	A =	L = 4 W = 12	A =
L = 9 W = 7	A =	L = 8 W = 5	A =
L = 6 W = 11	A =	L = 3 W = 13	A =

Equation Pairs - Area of a Rectangle - Multiplication

Liam believes you can find the area of a rectangle in two different ways. Can you write the two equations you could use to solve the area of a rectangle?

Remember – a = l x w

| 3cm |

7cm

Option 1
a = 7 x 3
a = 21cm²

Option 2
a = 3 x 7
a = 21cm²

Question — Write two equations that represent the area of a rectangle

#	Length	Width	Equation 1	Equation 2
1				
2	5cm			
3	9km	6km		
4	10cm	8cm		
5	7m	4m		
6	9m	5m		
7	6cm	12cm		
8	8km	11km		
9	4cm	9cm		
10	7m	6m		

Writing Multiplication Equations - Lottery Tickets

Amelia is selling lottery tickets for $15 a ticket. She needs to calculate how much money her customers owe her for her tickets.

Part 1 Use multiplication equations to fill in the table

#	# of Tickets (t)	Equation 1 $t \times 15 = ?$	Equation 2 $15 \times t = ?$
1			
2			
3			
4	3		
5	7		
6	9		
7	10		
8	5		

Part 2 Amelia sells tickets to two different people in the ...

#	# of Tickets Person 1	# of Tickets Person 2	Equation
1	5	3	$(5 \times 15) + (3 \times 15) = 120$
2	4	7	
3	9	2	
4	2	5	
5	6	6	

Multiplying Decimals - Solve the Variable

1) $1.5n = 3$
   $n =$

2) $n \times 2.5 = 5$
   $n =$

3) $s \times 2.2 = 6.6$
   $s =$

4) $7.5 \_\_ = p$

5) $5.3p = 15.9$
   $p =$

6) $12.1r = 48.4$
   $r =$

7) $11.\_n = 3$
   n

8) $n \times 3.5 = 17.5$
   $n =$

9) $t \times 4.4 = 22$
   $t =$

10) $6.7n = 20.1$
    $n =$

11) $4.\_$

12) $3.4 \times 2 = p$
    $p =$

13) $7.6n = 38$
    $n =$

14) $6.5n =$
    $n =$

15) $\_.1s = 50.5$
    $\_ =$

16) $7.5s = 45$
    $s =$

17) $4.2 \times 3 = s$
    $s =$

Word Problems   Solve the questions below

1) Rylan has grown 32.5cm since she was born. She grew 6.5cm each year. How many years has she been alive?

2) It rained 3.3mm every hour. In total, it rained 26.4mm. How many hours did it rain?

Word Problems - Writing Multiplication Equations

Questions | Answer the questions below

1) Tim owns an apple tree farm. His staff brings him 10 baskets of apples that all have the same number of apples in it. There are 120 apples in the 10 baskets. Which equation tells us how many apples (a) are in each basket?

a x 10 = 120	10 x 120 = a
a x 120 = 10	10 x a = 120

2) A box ___ 12 cookies in it. Ryan needs 132 cookies for his school. Which equation ___ his ___ many boxes (b) he needs?

12 x 1	12 x b = 132
12	b x 12 = 132

3) Each child at a party gets 1 ___ kets ___ rcade. There are 9 children. Which equation will tell us how total ___) are ___ d?

9 x 13 = t	1
t x 9 = 13	___

4) John cuts 10 equal sized logs into equal pieces. He now has 1 ___ d. How many pieces (p) were in each log?

p x 10 = 140	140 x 10 = p
10 x p = 140	140 x p = 10

5) Nicole buys 8 cases of pop. She now has 96 cans of pop. Which equation tells us how many cans of pop (p) are in each case?

p x 8 = 96	96 x 8 = p
8 x p = 96	8 x 96 = p

Solving Multiplication Equations

Questions | Solve the problems below. The first one is done for you

1) The Mighty Bears play 3 games (g) a week for 7 weeks (w). How many games in total did they play (p)?

Equation : p = g x w   or   g x w = p

p = 3 x 7

p = 21   Therefore, the Mighty Bears played 21 games in total.

2) Jaxon ___ apples (a) from each tree at an apple orchard. He picked 72 apples in tot___ ___ ma___ ___ (t) did he pick apples from?

Equation : _____

_____

_____

3) Kai puts 8 small chlorine p___ (p) ___ ___ week. He went through 96 total (t) chlorine pucks last summer. ___ ___ ___ did he have the pool running last summer?

Equation : _____

_____

_____ Therefore, _____

4) Isaiah invests (i) 225 each week for 10 weeks (w). How much ___ ___ ___ he have invested after 10 weeks?

Equation : _____

_____

_____ Therefore, _____

5) Ivy paid (p) $525 for her lawn to be cut for the summer. She was charged $25 per time (t). How many times was her lawn cut (c)?

Equation : _____

_____

_____ Therefore, _____

Division - Are They Equal?

Are the equations equal? Put a slash through the equal sign for any equations that are not equal

$8 \div 2 \neq 5$ $9 \div 3 = 3$ $15 \div 3 \neq 3$

Questions Put a slash through the equal sign if it is not balanced

	2) $25 \div 5 = 4$	3) $32 \div 4 = 8$
4) $36 \div 6 = $	$2 = 9$	6) $28 \div 4 = 8$
7) $50 \div 5 = 10$	8) $\div 6 = $	9) $36 \div 4 = 8$
10) $99 \div 11 = 10$	11) $35 \div 7 = 5$	1 6
13) $24 \div 4 = 8$	14) $49 \div 7 = 6$	15) $45 \div 9 = 5$
16) $72 \div 8 = 8$	17) $81 \div 9 = 9$	18) $36 \div 3 = 12$
19) $56 \div 7 = 9$	20) $48 \div 12 = 3$	21) $63 \div 9 = 7$

Pre-Algebra - Balancing Division Equations

Balancing equations means both sides of the equal sign must be the same.

Examples

$$25 \div 5 = \boxed{5}$$ (5 above)

$$18 \div \boxed{3} = 6$$ (6 above)

Questions — Fill in the missing number to balance the equation

1) $36 \div$ [ ]

2) $35 \div 7 =$ [ ]

3) $20 \div 5 =$ [ ]

4) $24 \div$ [ ]

5) [ ] $= 3$

6) $35 \div$ [ ] $= 7$

7) [ ] $\div 5 = 4$

8) [ ] $\div 6 =$

9) [ ] $\div 3 = 9$

10) $36 \div 4 =$ [ ]

11) $56 \div$ [ ] $=$

12) [ ] $\div 8 = 9$

13) $24 \div$ [ ] $= 3$

14) $99 \div 9 =$ [ ]

15) $64 \div$ [ ] $= 8$

16) $48 \div$ [ ] $= 6$

17) $20 \div 4 =$ [ ]

18) $48 \div$ [ ] $= 12$

19) $49 \div$ [ ] $= 7$

20) $36 \div 3 =$ [ ]

21) $72 \div 6 =$ [ ]

Division - Find the Variable

A **variable** is a letter that represents an unknown number. When we don't know a number, we can use a letter to take the place of the unknown number.

Example: $27 \div n = 3$

We can figure out the unknown number by balancing the equation – n = 9.

Question	Find out the value of the variable	

1)	2) $n \div 9 = 3$ n =	3) $s \div 5 = 3$ s =
4) $24 \div$ p =	5) $24 \div p = 6$ p =	6) $48 \div r = 8$ r =
7) $36 \div n = 6$ n =	8) n =	9) $t \div 11 = 5$ t =
10) $90 \div n = 9$ n =	11) = t t =	12) $81 \div 9 = p$ p =
13) $64 \div n = 8$ n =	14) $77 \div n = $ n =	15) = 11
16) $48 \div s = 4$ s =	17) $42 \div 7 = s$ s =	18)

Part 2	Calculate the area using the variables <u>Length</u> and <u>Width</u>

Servers at a restaurant share tips (t) equally at the end of the day. The number of people that share the tips depends on how many servers (s) were working. We can use a formula to find out how much money (m) each server takes home: m = t ÷ s

t = 150 s = 5	m = 150 ÷ 5	m = 30	t = 120 s = 3	m = ÷	m =
t = 180 s = 3	m = ÷	m =	t = 210 s = 7	m = ÷	m =
t = 250 s = 5	m = ÷	m =	t = 320 s = 4	m = ÷	m =

Writing Division Equations - Sharing

Riley is the best boss! Every week, she brings in treats for her staff to share. Each week, there are different treats and a different number of staff members working at the office.

| Questions | Use a formula to find out how many treats (t) each person gets |

#	Treat	# of Staff (s)	Formula	Answer
1		8	d ÷ s = t	16 ÷ 8 = 2
2	cook	6	c ÷ s = t	
3	20 muffin			
4	16 slices of pizza (p)			
5	10 bagels (b)	10		
6	15 donuts (d)	5		
7	24 cookies (c)	8		
8	18 muffins (m)	6		
9	28 pastries (p)	4		
10	32 cookies (c)	8		
11	36 slices of pizza (p)	9		
12	24 bagels (b)	3		
13	25 muffins (m)	5		

Using Variables to Solve Division Equations

There are some instances where we know the values of variables and need to plug them into an equation.

For example:
$a \div b = c$ $a = 35$ $b = 5$
$35 \div 5 = c$
$c = 7$

Question	Find out the value of the variable

$a \div b = c$ $a = $ $b = 5$ _____ ÷ _____ $c = $	$e \div n = f$ $e = 18$ $n = 3$ _____ ÷ _____ $= f$ $f = $
$r \div y = t$ $r = $ _____ ÷ _____ $= t$ $t = $	$t \div g = h$ $t = 64$ $g = 8$ _____ ÷ _____ $= h$
$a \div b = c$ $a = 81$ $b = 9$ _____ ÷ _____ $= c$ $c = $	$e \div$ 9 $n = 3$ $f = $
$r \div y = t$ $r = 28$ $y = 7$ _____ ÷ _____ $= t$ $t = $	$t \div g = h$ $t = $ _____ ÷ _____ $= h$ $h = $
$a \div b = c$ $a = 48$ $b = 8$ _____ ÷ _____ $= c$ $c = $	$e \div n = f$ $e = 36$ $n = 4$ _____ ÷ _____ $= f$ $f = $
$r \div y = t$ $r = 24$ $y = 2$ _____ ÷ _____ $= t$ $t = $	$t \div g = h$ $t = 49$ $g = 7$ _____ ÷ _____ $= h$ $h = $

Word Problems - Writing Division Equations

Questions | Answer the questions below

1) Neil has 180 crayons that he wants to split into equal groups of 20. Which equation shows how many groups (g) of 20 he will have?

| g ÷ 180 = 20 | 180 ÷ 20 = g |
| g ÷ 20 = 180 | 180 ÷ g = 20 |

2) Katie has 25 friends over for a big party. She wants to have 2 treats for each friend. Which equation shows how many treats in total (t) she will need?

| 25 ÷ ... | 25 ÷ t = 2 |
| ... | t ÷ 25 = 2 |

3) The kindergarten class has 300 blocks and 15 students. Which equation shows how many blocks (b) each student can have?

| 300 ÷ 15 = b | 300 ÷ ... |
| b ÷ 300 = 15 | ... |

4) Mrs. Wilson brought in 90 candies for her students. She has 30 students. Which equation shows how many candies (c) each student will get?

| c ÷ 90 = 30 | 90 ÷ 30 = c |
| 90 + c = 30 | 30 ÷ c = 90 |

5) Mr. Rogers is donating $1000 to different charities. He gives $200 to the charities of his choice. Which equation shows how many charities (c) he donated to?

| c ÷ 1000 = 200 | 1000 ÷ 200 = c |
| 200 ÷ c = 1000 | 1000 ÷ c = 200 |

Solving Division Equations

Questions | Solve the problems below. The first one is done for you

1) Jonathon has 1000 potatoes (p) from his farm. He wants to sell them in bags (b) of 20. How many bags will he have in total (t)?

Equation : $t = p \div b$

$t = 1000 \div 2$

$t = 50$ _____ erefore, Jonathon will have 50 bags of potatoes to sell.

2) Mr. ____ ____ ____ bjects (s) for 225 minutes total (t). If he teaches the 5 subje ____ ually, h____ minutes (m) will he teach each subject?

Equation : _____

_____

_____ ____ efore ____

3) Jayden is inviting 9 friends ____ a p____ ____ total of 117 cookies (c) for his friends to share evenly. How many co____ ____ ea____ ____ d get (g)?

Equation : _____

_____

_____ Therefore, _____

4) Matthew has 228 toys (t) stored in 12 different boxes (____ wha____ ____ toys are in each box?

Equation : _____

_____

_____ Therefore, _____

5) A group of friends go on a trip together. They all agree they will equally split up the driving duties. The total (t) distance is 1950km. Each friend drove (d) 325km. How many friends (f) went on the trip?

Equation : _____

_____

_____ Therefore, _____
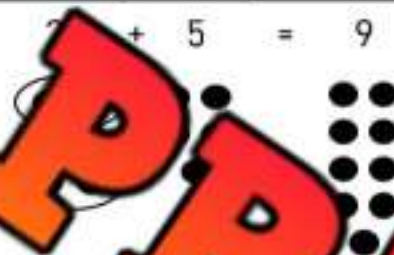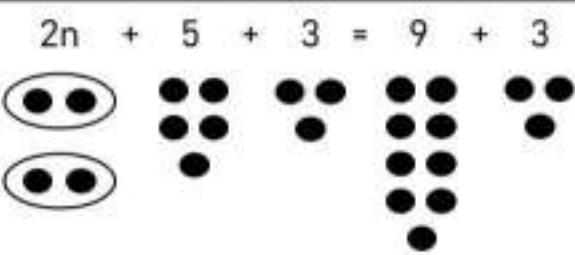
Preservation of Equality

When we add or subtract the same amount from both sides of an equal sign, the equation does not change. Investigate this theory below.

Questions | Draw circles to represent the equations

#	Original Equation	Change	New Equation
1	$2n + 5 = 9$	Add 3	$2n + 5 + 3 = 9 + 3$
2	$5 + $ ...	S...	
3	$12 - n = 7$	Add 3	
4	$3n + 4 = 13$	Subtract 5	
5	$3 + 4n = 15$	Add 7	

Preservation of Equality

Questions	Write four equivalent forms of the equations below

#	Original Equation
1	$4n = 20$
Add _ to each side	
Subtract _ from each side	
Multiply each side	
Divide ea	

#	Original Equation
2	
Add 8 to each side	
Subtract 13 from each side	
Multiply each side by 3	
Divide each side by 6	

#	Original Equation
3	$5n - 5 = 25$
Add 50 to each side	
Subtract 20 from each side	
Multiply each side by 4	
Divide each side by 5	

Name: _____ 92

Preservation of Equality

When we change an equation by adding, subtracting, multiplying, and dividing the same amount from both sides, does the equation change? Investigate below!

Questions | Fill in the table below

#	Original Equation	Change	New Equation
1	5n = 20 4	Add 10 to each side	5n + 10 = 20 + 10 n = 4
2		Add 7 to each side	
3	15 + n n =	Subtract 12 from each side	
4	6n = 12 n =	Multiply each side	
5	2n = 16 n =	Divide each side by	
6	52 − n = 34 n =	Subtract 15 from each side	
7	68 + n = 85 n =	Add 13 to each side	
8	5n = 50 n =	Multiply each side by 4	
9	3n = 27 n =	Divide each side by 3	

Preservation of Equality - Word Problems

Questions   Follow the instructions below

Josh wrote an equivalent form of the equation. Explain what he did to preserve the equality and write your own equation using the preservation of equality.

Equation	1) 5b = 20
Josh's Equivalent Equation	... + 15 = 20 + 15
Your Equation	

Equation	2) 2b − 5 = 15
Josh's Equivalent Equation	2b − 5 − 10 = 15 − ...
Your Equation	

Equation	3) 6 + r − 5 = ...
Josh's Equivalent Equation	(6 + r − 5) x 2 = 10 x 2
Your Equation	

Equation	4) 25 − r x 3 = 10
Josh's Equivalent Equation	(25 − r x 3) ÷ 2 = 10 ÷ 2
Your Equation	

Name: _____ 94

Unit Test - Algebra

Part 1   Find out the value of the variable

9 + n = 15 n =	124 + 15 = y y =	p + 48 = 79 p =
9_ _ = y 	76 – y = 61 y =	p – 16 = 50 p =
3n _ n =	$\frac{36}{n}$ = 12 =	6s = 48 s =

Part 2   Find out the v____e of _____

a + b + c = d a = 9 b = 10 c = 8 _____ + _____ + _____ = d d =	t ÷ _ _____ g = 6 _____ ÷ _____ h =
r ÷ y = t r = 28 y = 7 _____ ÷ _____ = t t =	en = f e _____ _____ x _____ = _ f =
ab = c a = 6 b = 8 _____ x _____ = c c =	e + c + g = t e = 9 c = 6 g = 14 _____ + _____ + _____ = t t =
a – b = c a = 108 b = 11 _____ – _____ = c c =	e – n = f e = 125 n = 22 _____ – _____ = f f =

Part 3	Solve the word problems below

1) Jacob picked 15 apples (a) from each row of apple trees. He picked 75 apples in total (t). How many apples did he pick in each row (r)?

Equation : _____

_____

_____   Therefore, _____

2) They dec__ to budget (b) $400 on dinner out for 4 nights. They spent $90 on the first (f) din___ 28 on the second (s) dinner and $85 on the third (t) dinner. How much do___ left for the fourth dinner (f)?

Equat___

_____

_____

3) A family of 6 (f) bu___ ___ch family member gets 4 donuts (d). How many donuts were there ___?

Equation : _____

_____

_____   Therefore, _____

4) Hailey spent $475 total (t) at a sporting goods st___ ___bough___ ___skates (s) for $275, new gloves (g) for $130, and a new stick for (s)___ ___of ___ H___ much is s worth?

Equation : _____

_____

_____   Therefore, _____

Part 4	Use two different equations to find the area using the given measurements

#	Length	Width	Equation 1	Equation 2
1	10m	7m		
2	7cm	8cm		
3	9km	4km		

Part 5	Evaluate the following expressions for $x = 6$

1) $x + 11 - 3$	2) $4 + 3x$	3) $40 - 2x$
4) $6 + 12 \div x$	5) $4x - (5 + 5)$	6) $x + 3 \times 6$

Part 6	Emm... ...anna ... ...wered the questions below. Circle who's right

	Quest... ...'s Answer		Savanna's Answer
1	$y = 4$ $3 + (y + 5)$		14
2	$y = 3$ $20 - 5y$	5	45
3	$y = 2$ $y + 3 \times 3$	15	11
4	$y = 4$ $y + 16 \div 2$	12	10
5	$y = 8$ $y - 4 \times 2$	0	8

Grade 6

Measurement and Geometry

	Curriculum Expectations	Pages
M01	Students will be expected to demonstrate an understanding of angles by • identifying examples of angles in the environment • classifying angles according to their measure • estimating the measure of angles using 45°, 90°, and 180° as reference angles • determining angle measures in degrees • drawing and labelling angles when the measure is specified	5 – 30
M0		0
M0		2
G01	Students will be expected to construct and compare triangles, including scalene, isosceles, equilateral, right, obtuse, or acute in different orientations.	31 – 35, 37 – 38
G03	Students will be expected to perform a combination of translation(s), rotation(s), and/or reflection(s) on a single 2-D shape, with and without technology, and draw and describe the image.	73 – 75, 78 – 80, 83 – 87, 90
G04	Students will be expected to perform a combination of successive transformations of 2-D shapes to create a design and identify and describe the transformations.	91 – 95
G05	Students will be expected to identify and plot points in the first quadrant of a Cartesian plane using whole number ordered pairs.	96 - 103
G06	Students will be expected to perform and describe single transformations of a 2-D shape in the first quadrant of a Cartesian plane (limited to whole number vertices).	76 – 77, 81 – 82, 88 - 89

Preview of 90 pages from this product that contains 245 pages total.

Naming Angles

Obtuse Larger than right angle	**right angle** 90°	**Acute** Smaller than right angle	**Reflex** Larger than 180°
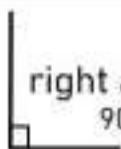
Questions | Label the angles <u>acute</u>, <u>right</u>, <u>obtuse</u>, or <u>reflex</u>

1)	2)	3)	4)

5)	6)	7)	8)

9)	10)	11)	12)

13)	14)	15)	16)

6
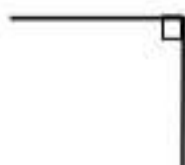
Sorting Angles

Part 1 — Sort the angles into the categories below

A   B   C   D   E   F   G   H   I   J

Angles	Right Angle	Obtuse	Acute
Letters			

Part 2 — Sort the angles into the categories below

A   B   C   D   G   H

Angles	Right Angle	Obtuse	
Letters			
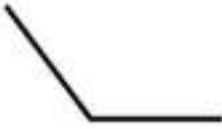
Part 3 — Circle the angles below

Drawings			
Angles	Right Angle	Obtuse	Acute

Naming Angles - Right, Obtuse, Acute, Straight, and Reflex

Right Angle – 90°	Acute Angle – smaller than 90°	Obtuse Angle – larger than 90°	Straight Angle – 180°	Reflex Angle – larger than 180°

Question   Label the angle – straight, acute, obtuse, right, or reflex

1)	2)	3)	4)

5)	6)	8)

9)	10)	11)	

13)	14)	15)	16)
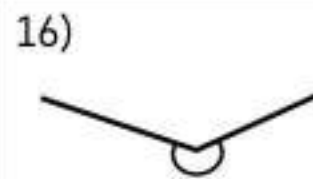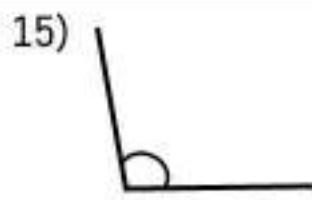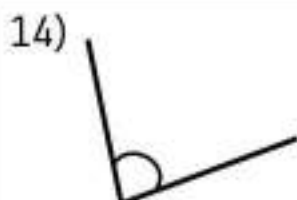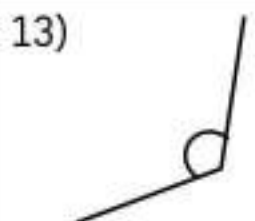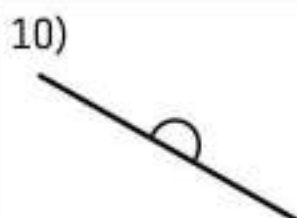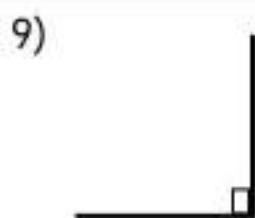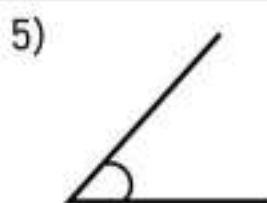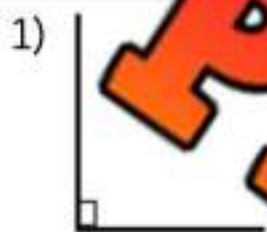
Naming Angles - Right, Obtuse, Acute, and Reflex

Questions | Label the angle – acute, obtuse, right, or reflex

1)

right acute obtuse reflex

2)

right acute obtuse reflex

3)

right acute obtuse reflex

4)
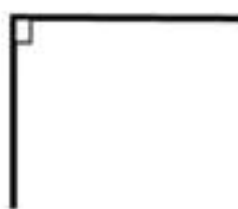
right acute obtuse reflex

5)

right acute obtuse reflex

6)

right acute obtuse reflex

7)
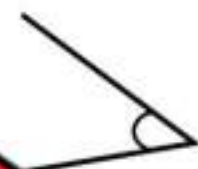
right acute obtuse reflex

8)

right acute obtuse reflex

9)

right acute obtuse reflex

10)

right acute obtuse reflex

11)

right acute obtuse reflex

12)

right acute obtuse reflex

13)

right acute obtuse reflex

14)
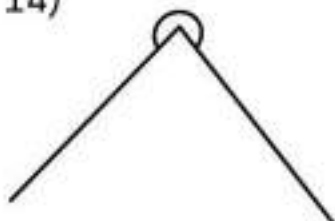
right acute obtuse reflex

15)

right acute obtuse reflex

16)
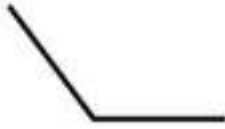
right acute obtuse reflex

Drawing Angles - Right, Obtuse, Acute, and Reflex

Right Angle – 90°	Acute Angle – smaller than 90°	Obtuse Angle – larger than 90°	Straight Angle – 180°	Reflex Angle – larger than 180°

Question   Draw acute, obtuse, right, and reflex angles below

1)	2)	3)	4)
Acute	Obtuse	Right	Reflex

5)	6)	7)	8)
Reflex	Obtuse	Acute	Straight

9)	10)	11)	12)
Right	Acute	Obtuse	Reflex

Measuring Angles - Printed Protractor

Questions | Measure the angles and label them <u>acute</u>, <u>right</u> or <u>obtuse</u>

1)

Angle = _____   Type of Angle = _____

2)

Angle = _____   Type of Angle = _____

3)

Angle = _____   Type of Angle = _____

4)
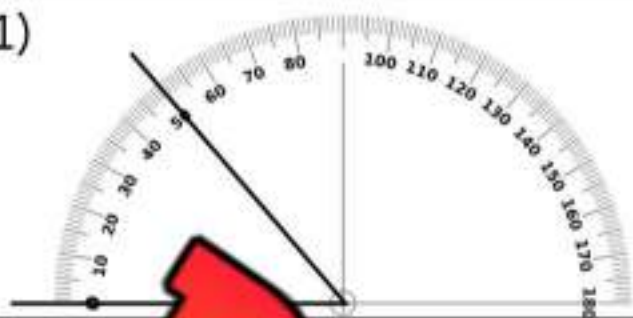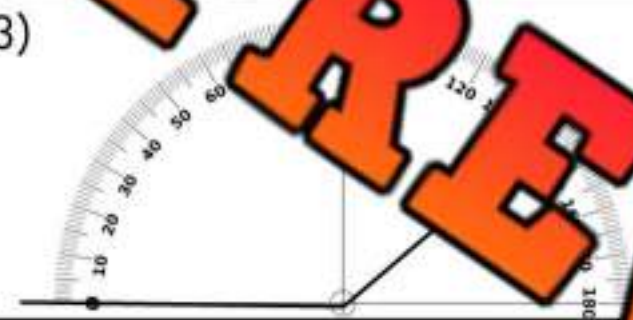
Angle = _____   Type of Angle = _____

5)
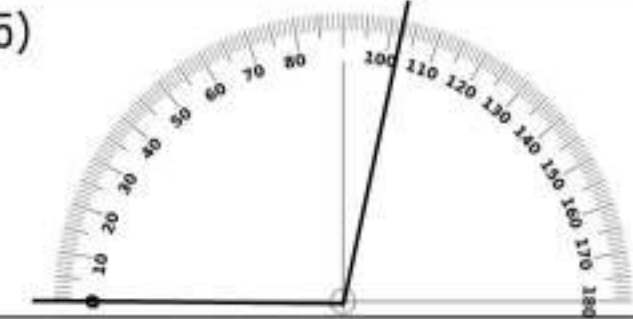
Angle = _____   Type of Angle = _____

6)
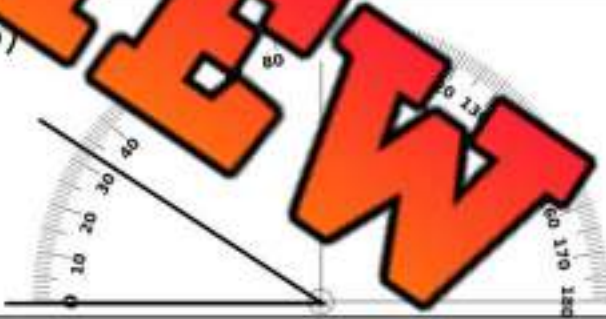
Angle = _____   Type of Angle = _____

7)
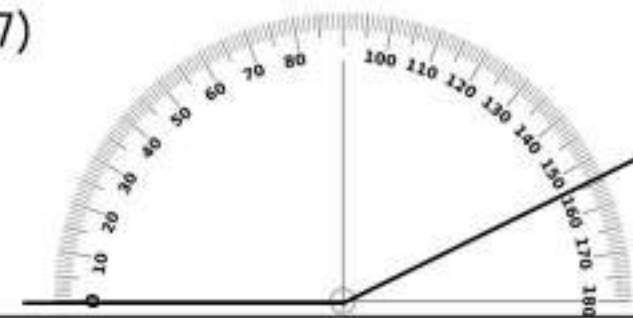
Angle = _____   Type of Angle = _____

8)
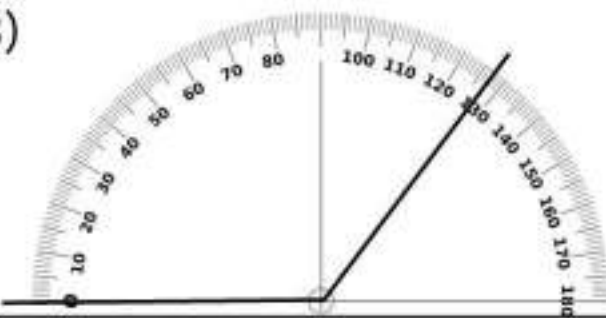
Angle = _____   Type of Angle = _____

Measuring Angles Up To 180°

Questions | Measure the angles and label them <u>acute</u>, <u>right</u>, or <u>obtuse</u>
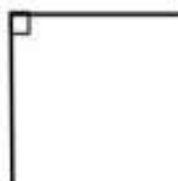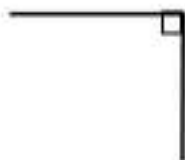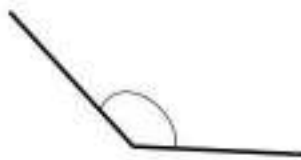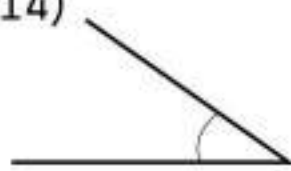
1)	2)	3)	4)
5)		7)	8)
9)	10)	11)	
13)	14)	15)	16)

Constructing Angles - Estimating - Multiple Choice

| Questions | Circle which angle you think it is. Do not use a protractor. |

1)

a) ∠= __°
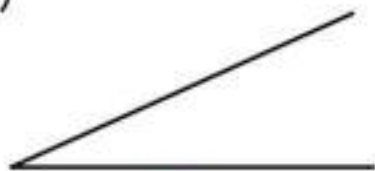
= 155°

d) ∠=

2)

a) ∠= 95°

b) ∠= 100°

c) ∠= 80°

d) ∠= 120°

3)

a) ∠= 168°

b) ∠= 50°

c) ∠= 120°

d) ∠= 12°

4)

a) ∠= 74°

b) ∠= 170°

c) ∠= 30°

d) ∠= 106°

5)

a) ∠=

b) ∠= 30°

c) ∠= 143°

d) ∠= 170°

6)

a) ∠= 50°
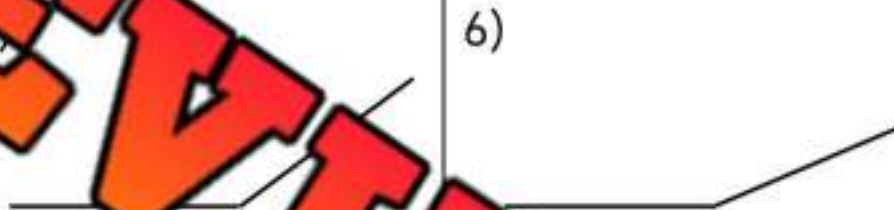
157°

7)
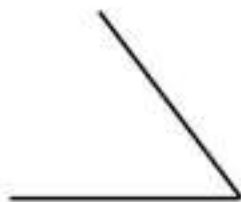
a) ∠= 95°

b) ∠= 54°

c) ∠= 110°

d) ∠= 160°

8)

a) ∠= 60°

b) ∠= 120°

c) ∠= 10°

d) ∠= 160°

9)

a) ∠= 171°

b) ∠= 9°

c) ∠= 50°

d) ∠= 85°

Constructing Angles - Printed Protractor

Questions | Construct the angles and label them <u>acute</u>, <u>right</u> or <u>obtuse</u>

1)
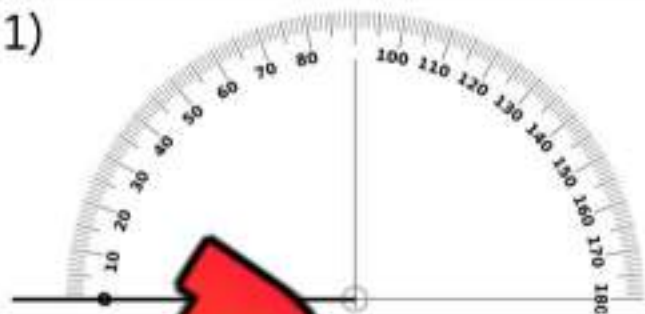
Angle = ∠= _____ Type of Angle = _____

2)
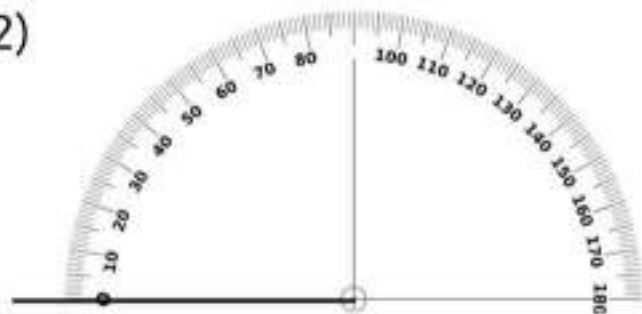
Angle = ∠= 110° Type of Angle = _____

3)
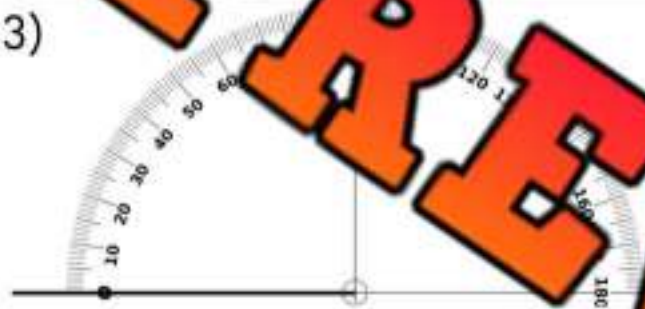
Angle = ∠= 42° Type of Angle = _____

4)
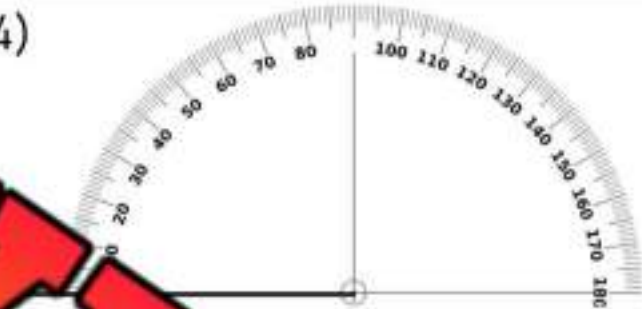
Angle = ∠= ___° Type of Angle = _____

5)
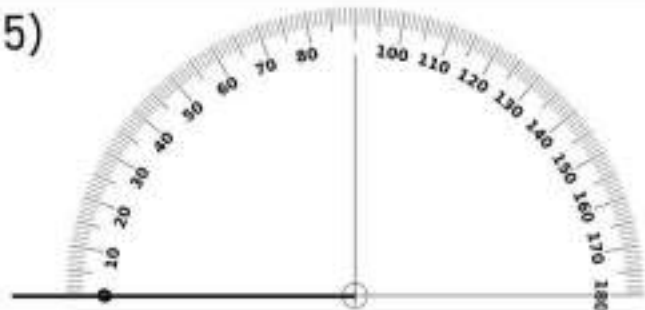
Angle = ∠= 124° Type of Angle = _____

6)

Angle = ∠= 168° Type of Angle = _____

7)
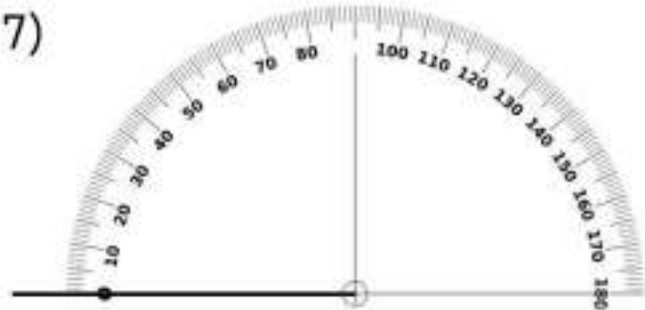
Angle = ∠= 49° Type of Angle = _____

8)
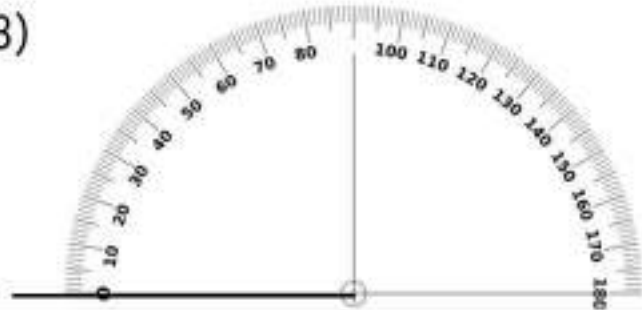
Angle = ∠= 173° Type of Angle = _____

Constructing Angles

Part 1 Use a protractor to draw the angles below using the line provided

1)

_____

∠= 45°

2)

_____

∠=70°

3)

_____

∠= 120°

Part 2 Use a protractor to draw the angles below

1)

∠= 95°

2)

∠= 115°

3)

4)

∠= 60°

5)

∠= 25°

6)

∠= 170°

Constructing Angles - Estimating

Use your knowledge of obtuse, acute, and right angles to help you estimate the angle measurements below. You can also use these angles to assist you with your estimations.

45°	90°	140°	180°

Part ~~1~~ ... angles below using the line provided without a protractor

1)	2)	3)
_____		_____
∠= 50°		∠= 130°

Part 2   Draw the angles below w~~ith a pr~~

1)	2)	
∠= 80°	∠= 70°	∠= 165°

4)	5)	6)
∠= 120°	∠= 30°	∠= 140°

Using Printed Protractor - Angles Up To 360°

Questions	Measure the angles below using the circular protractor

1)
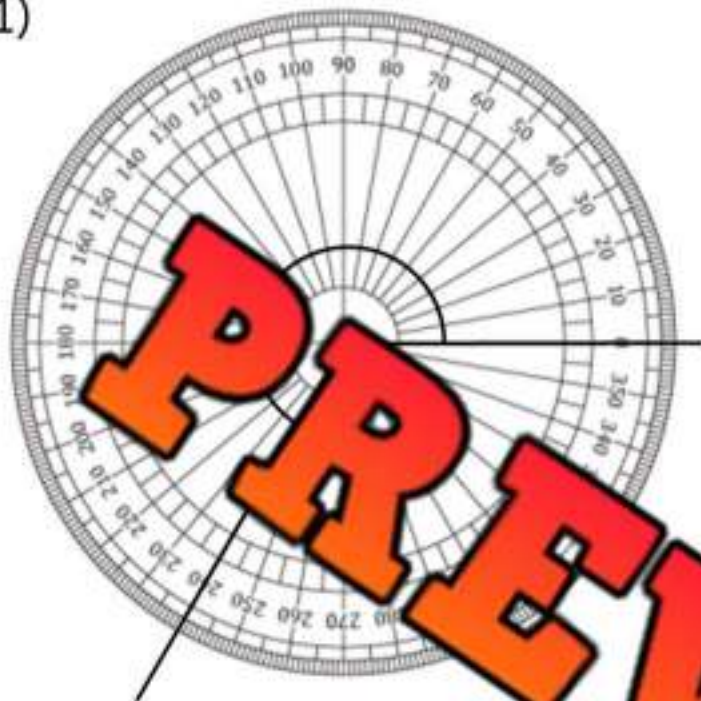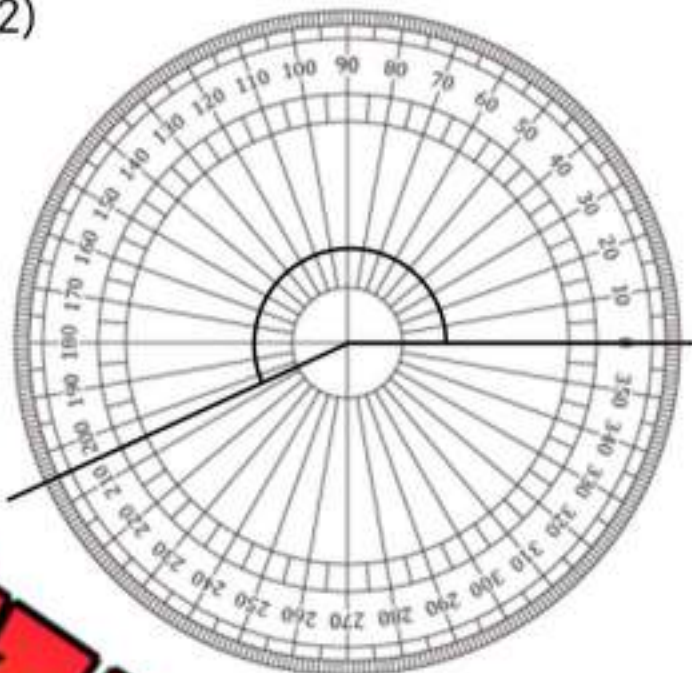
Angle = _____   Type of Angle = _____

2)

Angle = _____   Type of Angle = _____

3)

Angle = _____   Type of Angle = _____

4)
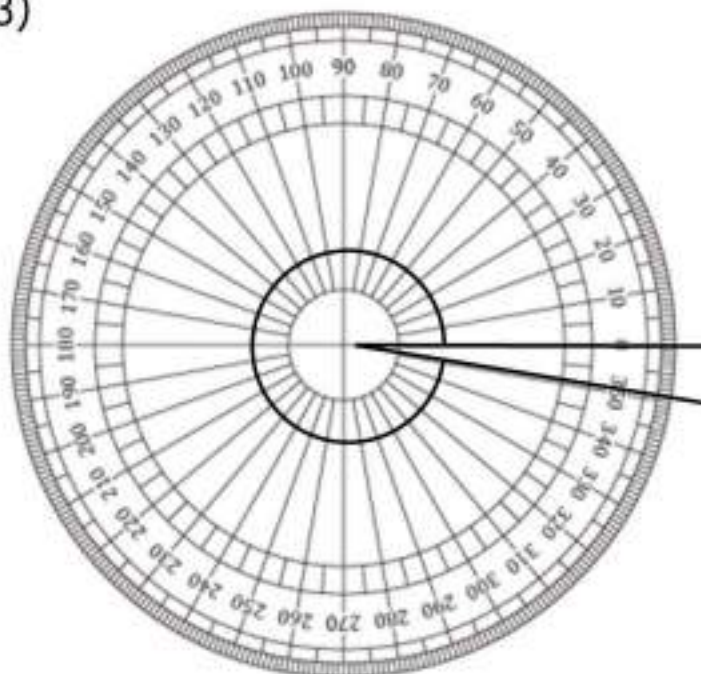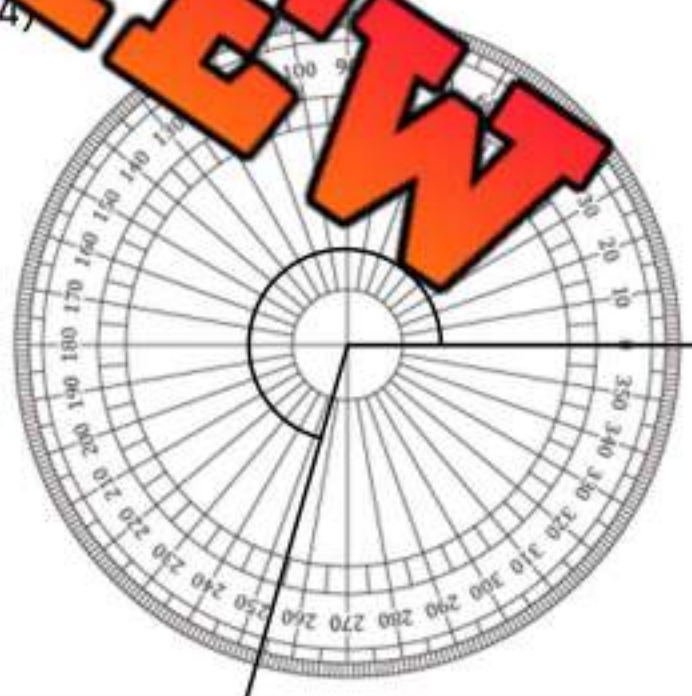
Angle = _____   Type of Angle = _____

Measuring Angles Up To 360°

We can measure reflex angles that are larger than 180° by using a circular protractor or a semi-circular protractor.

When using a semi-protractor, you can use one of two strategies:
1) Measure the angle starting with 180° and add 180°
2) Measure the remaining angle from 0° and subtract 360°

Solution

Strategy 1
180 + 100 = 280

Strategy 2
360 – 80 = 280

Questions   Measure each reflex ___ below
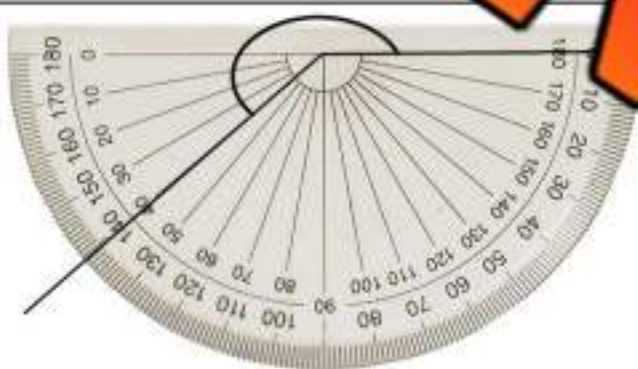
1) Angle Size =

2) Angle Size =
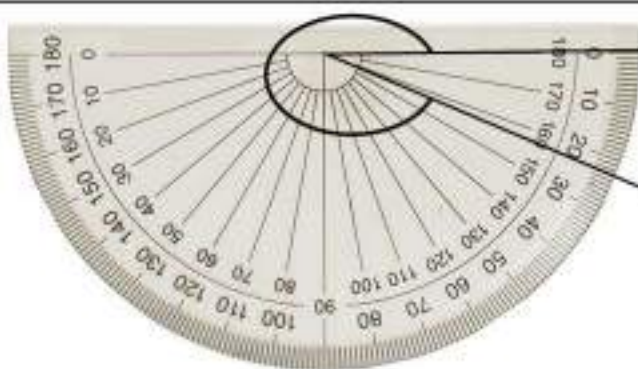
3) Angle Size =
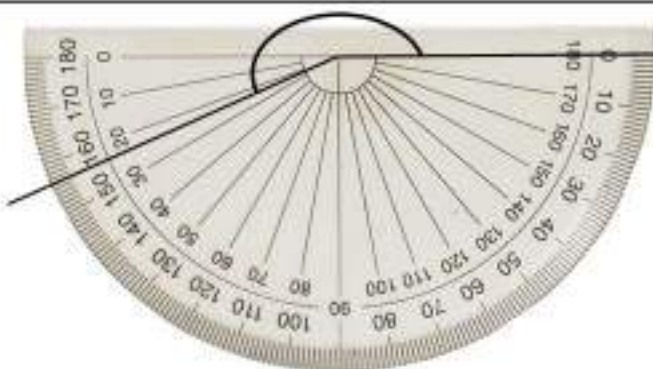
4) Angle Size =

Constructing Angles - Estimating - Multiple Choice

| Questions | Circle which angle you think it is. Do not use a protractor |

1)

a) ∠= ___°
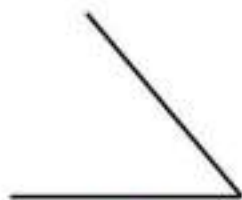
___= 110°

d) ∠= ___

2)
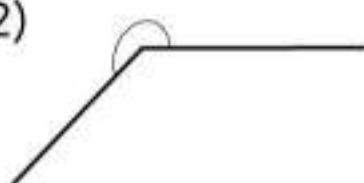
a) ∠= 95°

b) ∠= 100°

c) ∠= 225°

d) ∠= 290°

3)

a) ∠= 171°

b) ∠= 9°

c) ∠= 50°

d) ∠= 85°

4)

a) ∠= 168°

b) ∠= 50°

c) ∠= 120°

d) ∠= 10°

5)

a) ∠=

b) ∠= 120°

c) ∠= 10°

d) ∠= 160°

6)

a) ∠= 90°
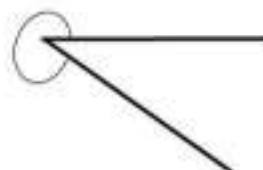
180°

7)

a) ∠= 50°

b) ∠= 160°

c) ∠= 20°

d) ∠= 100°

8)
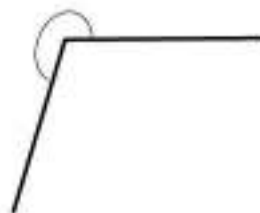
a) ∠= 75°

b) ∠= 190°

c) ∠= 255°

d) ∠= 355°

9)

a) ∠= 40°

b) ∠= 30°

c) ∠= 140°

d) ∠= 170°

Name: _____

Measuring Angles Up To 360°

Questions | Measure the angles below

1)

2)

3)

4)

5)
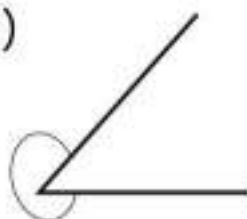
7)

8)
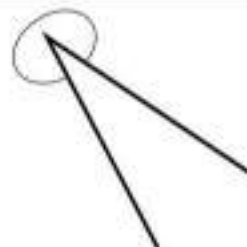
9)

10)

11)

13)

14)

15)

16)
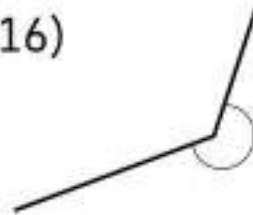
Measuring Angles

Questions | Measure the angles and label the quadrilaterals: <u>Kite</u>, <u>Trapezoid</u>, <u>Parallelogram</u>

1)
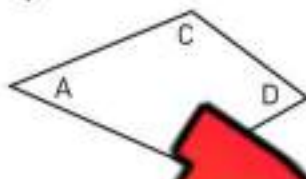
∠A=

∠B=

∠C=

∠D=

2)
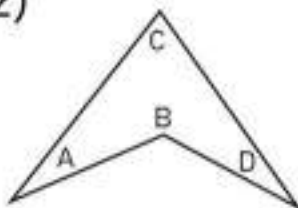
∠D=

3)
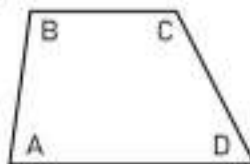
∠A=

∠B=

∠C=

4)

∠A=

∠B=

∠C=

∠D=

5)

∠A=

∠B=

∠C=

∠D=

6)

∠A=

∠B=

∠C=

∠D=

∠A=

∠B=

∠C=

∠D=

∠A=

∠B=

∠C=

∠D=
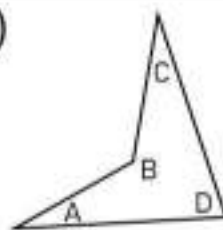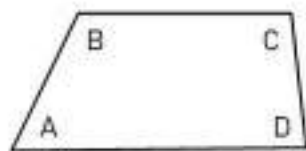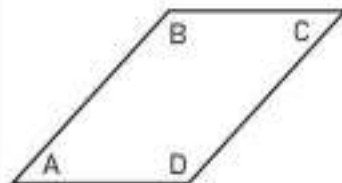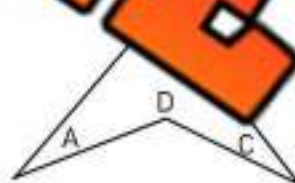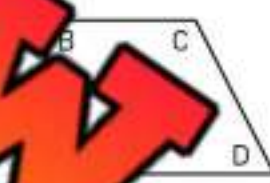
Contruction Angles Up To 360°

Questions | Construct the angles below

1)
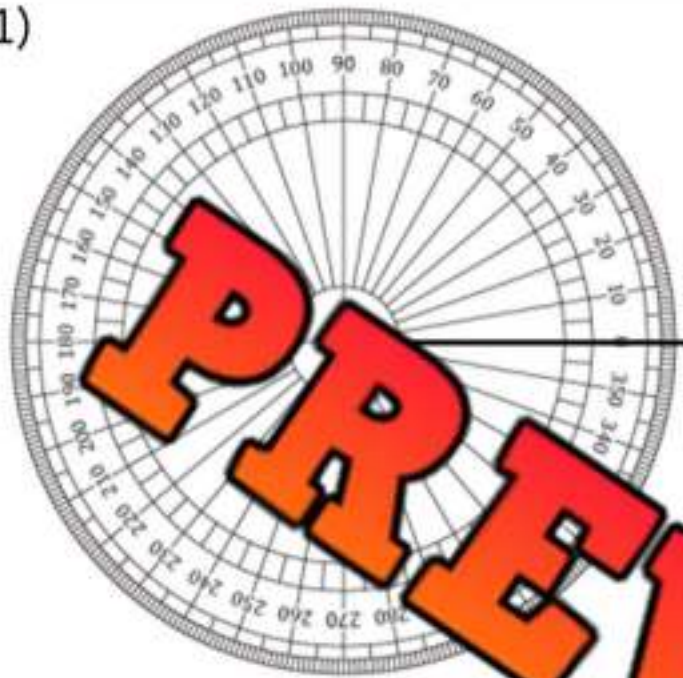
Angle = 195°

2)
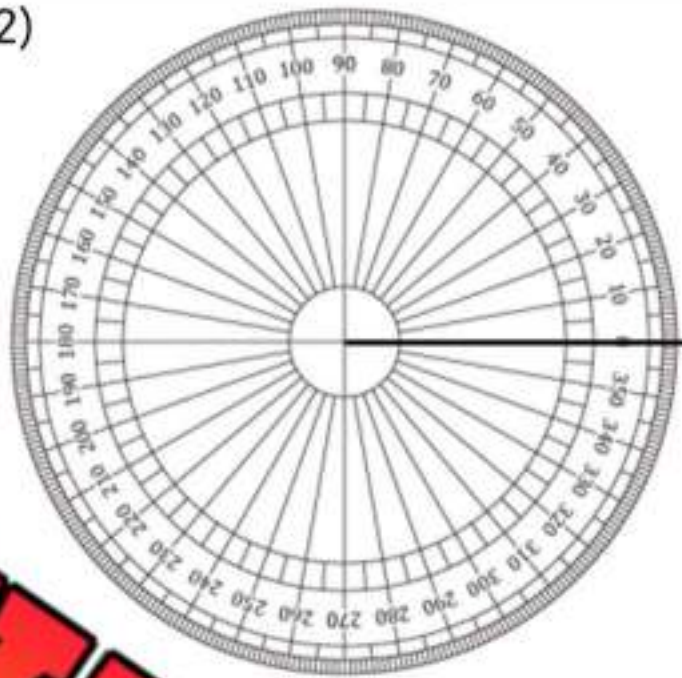
Angle = 292°

3)

Angle = 347°

4)
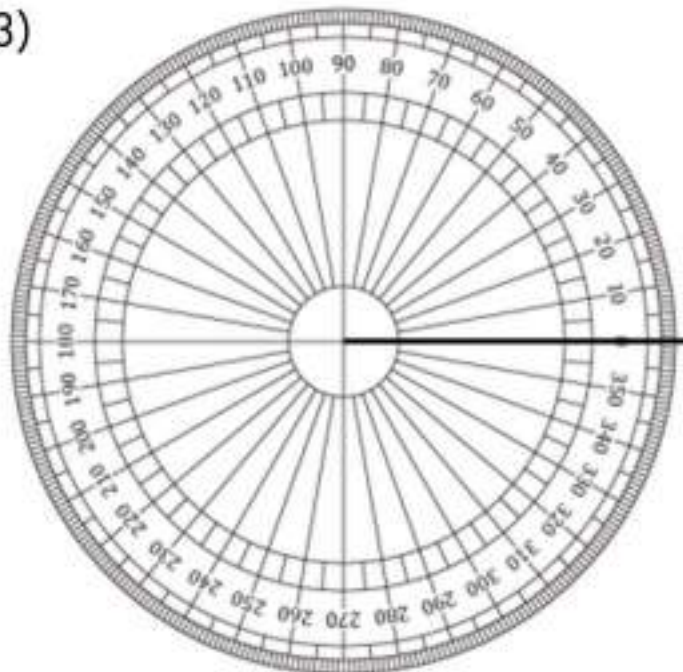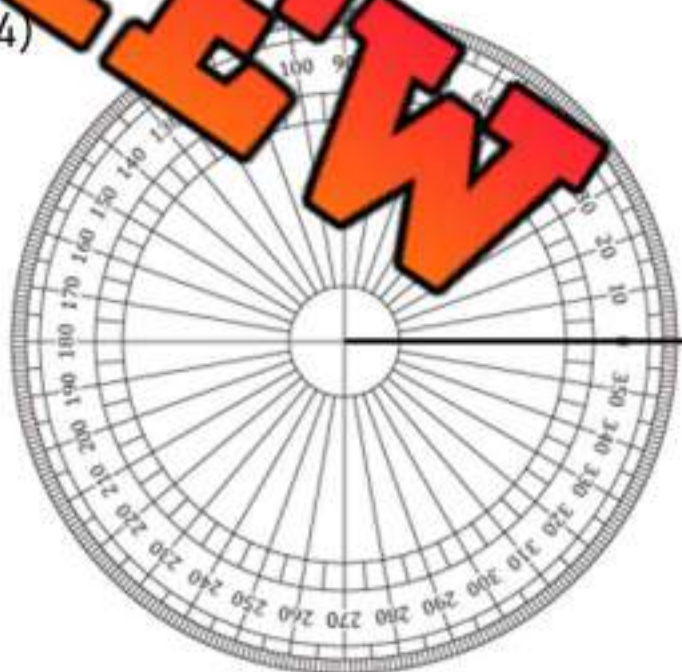
Angle = 262°

Contruction Angles Up To 360°

Part 1   Use a protractor to draw the angles below using the line provided

1)	2)	3)
∠= 200°	∠= 275°	∠= 350°

Part 2   Use a protractor to draw the angles below

1)	2)	3)
∠= 287°	∠= 322°	
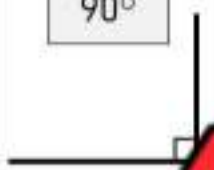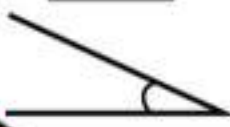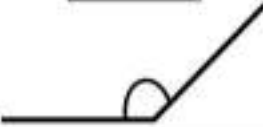
4)	5)	6)
∠= 248°	∠= 318°	∠= 264°

Constructing Angles - Estimating

Use your knowledge of obtuse, acute, right, and reflex angles to help you estimate the angle measurements below. You can also use these angles to assist you with your estimations.

Right Angle	Acute Angle	Obtuse Angle	Straight Angle	Reflex Angle
90°	45°	140°	180°	250°

Part 1 Construct the angles below using the line provided

1)	2)	3)	4)
∠= 75°	∠=35°	∠= 9°	∠= 220°

Part 2 Draw the angles below

1)	2)	3)	4)
∠= 30°	∠= 110°	∠= 280°	∠= 350°

5)	6)	7)	8)
∠= 210°	∠= 310°	∠= 60°	∠= 130°

Measuring Angles

Acute Triangle – All angles are acute

Obtuse Triangle – One angle is obtuse

Right Triangle – One right angle
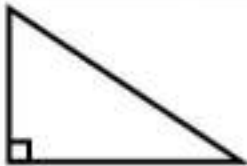
Questions	Measure the angles and label the triangles Acute, Obtuse, or Right

1)

∠A=

∠B=

∠C=

Obtuse Triangle

2)

∠A=

∠B=

∠C=

3)

∠A=

∠B=

∠C=

4)

∠A=

∠B=

∠C=

5)

∠A=

∠B=

∠C=

6)

∠A=

∠B=

∠C=

7)

∠A=

∠B=

∠C=

∠A=

∠B=
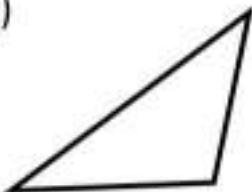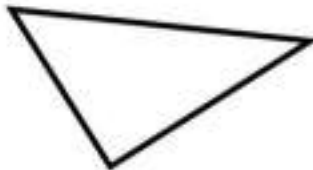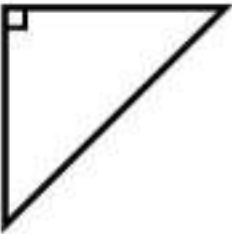
∠C=

Acute, Obtuse, and Right Triangles

Acute Triangle	Right Triangle	Obtuse Triangle
All Angles Are Less Than 90°	1 Angle Is 90°	1 Angle Is Greater Than 90°

Part 1 Label the triangles acute, obtuse or right
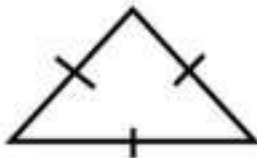
1)		3)	4)

5)	6)	7)	8)
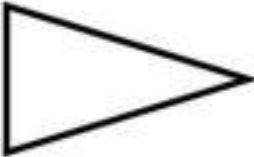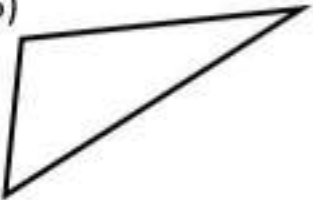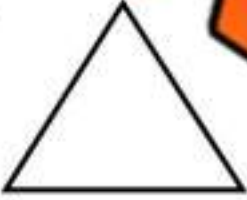
Part 2 Draw a picture of the three different types of triangle

9)	10)	11)
Acute Triangle	Obtuse Triangle	Right Triangle

Types of Triangles - Equilateral, Scalene, Isosocles

Equilateral Triangle	Isosceles Triangle	Scalene Triangle
3 Equal Sides 3 Equal Angles	2 Equal Sides 2 Equal Angles	No Equal Sides No Equal Angles

Part 1   Label the triangles equilateral, isosceles, or scalene

1)		3)	4)

5)	6)		8)

Part 2   Draw a picture of the three different types of triangl

9)	10)	11)
Equilateral Triangle	**Isosceles Triangle**	**Scalene Triangle**

Measuring Angles

Equilateral Triangle – All sides lengths are equal

Isosceles Triangle – Two side lengths are equal

Scalene Triangle – All three side lengths are different

Questions | Measure the angles and label the triangles <u>equilateral</u>, <u>isosceles,</u> or <u>scalene</u>

1)	2)	3)	4)
∠A=	∠A=		∠A=
∠B=	∠B=	∠B=	∠B=
∠C=	∠C=		∠C=
Scalene			
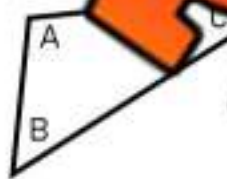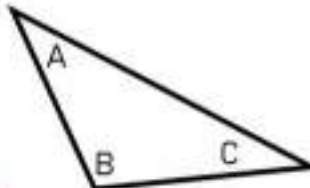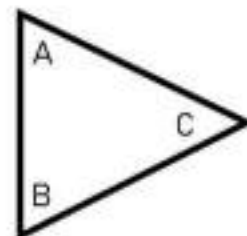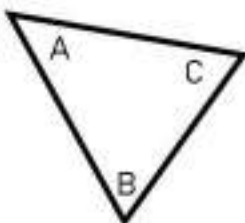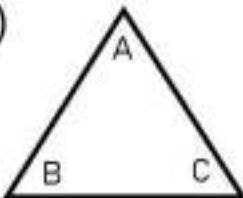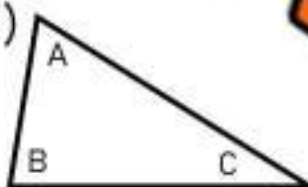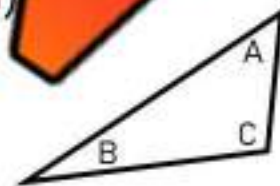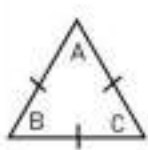
5)	6)	7)	8)
∠A=	∠A=	∠A=	∠A=
∠B=	∠B=	∠B=	∠B=
∠C=	∠C=	∠C=	∠C=

Interior Angles - Triangles

Interior angles are the angles inside a shape. The interior angles of a triangle will always equal 180°. We can use this information to solve for unknown angle measurements.

All angles are the same. Therefore, all angles = 60° 60 + 60 + 60 = 180	Two angles are the same. Therefore, angle A = 50° 65 + 65 + A = 180 A = 50°	All angles are different. Therefore, angle A = 55° 50 + 75 + A = 180 A = 55°
Equilateral Triangle	Isosceles Triangle	Scalene Triangle
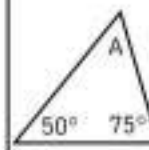
Questions: ...e values of the unknown angle measurements

1) 64°, A, 44°

A =

2) 67°, A

A =

3) A, 54°, B

A =

4) A, 42°, 77°

A =

5) 45°, A, □

A =

6) 46°, A, 70°

A =

7) A, B°, C°

A =

8) A, 65°, 70°

A =

9) A, 40°

A =

10) A, 45°, □

A =

11) 47°, A, 66°

A =

12) A, 62°, 72°

A =

Interior Angles - Triangles - Word Problems

1) An isosceles triangle has two different angle measurements. Angle AB and AC are both 75°. What is the angle measurement of BC?

2) A scalene triangle has angles of 66° and 72°. What is the third angle?

3) Liam cuts a pizza into triangle slices. He cuts 8 slices into equal sizes. The slices are isosceles triangles with angles of 52°. What is the third angle measurement?

4) Can an equilateral triangle have an angle of 50°? Explain why or why not.

5)   a) If two angles in a triangle equal 141°, what is the value of the third angle?

   b) Assuming all three angles are whole numbers, what type of triangle is it?

6) Sammy folds a paper into a right triangle for a paper airplane. One of the angles is 50°. What are the other two angles?

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.
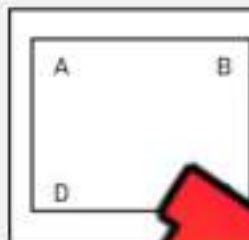
A rectangle has 4 equal angles that are 90°.

___ + ___ + ___ + ___ = 360
90 + 90 + 90 + 90 = 360
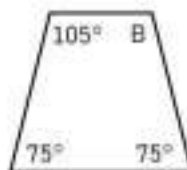
The trapezoid has 2 pairs of equal angles.

75 + 75 + 105 + B = 360
B = 105

Ques _____ he values of the unknown angle measurements

1)

100°

80°   80°

A =

2)

107°   73°

7   A°

A

3)

115°

A°

A =

4)

68°   68°

112° A

A =

5)

140°   40°

40°   A°

A =

6)

115°   60°

A°

A =

7)

59°   34°

123°   A

A =

8)

111°

A°

A =

9)

54°   84°

127°   A

A =

10)

A°

53°

A =

11)

51°   56°

131°   A

A =

12)

106°   126°

76°   A

A =

Interior Angles - Quadrilaterals

Questions   Find the values of the unknown angle measurements

1)

46°

2)

66°

3)

79°

4)

5)

6)

82°

31°   31°

7)

72°

29°

29°

8)

80°

9)

73°

111°

10)

135°

11)

64°

112°   122°

12)

24°   42°

13)

79°

14)

42°   66°

94°

15)

120°

83°

59°
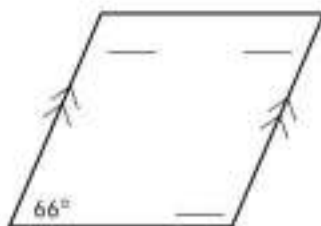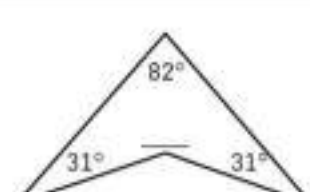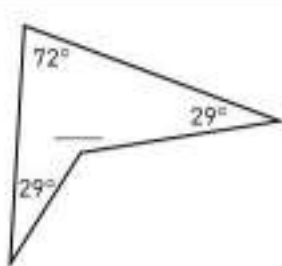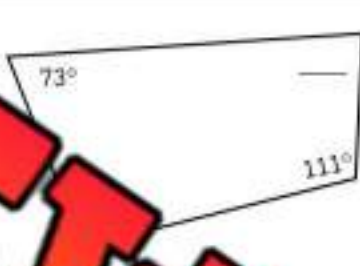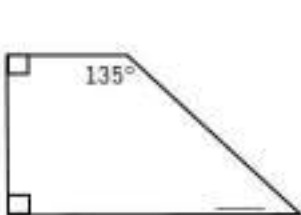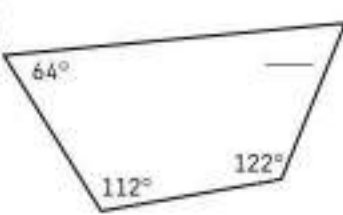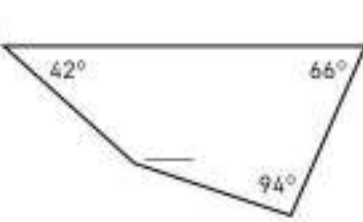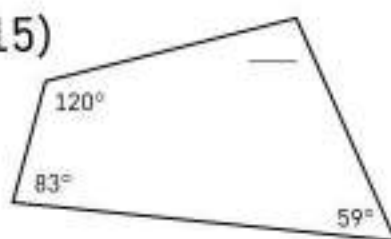
Angles - Unit Quiz

Part 1	Measure the angles and label them <u>acute</u>, <u>right</u> or <u>obtuse</u>

1)

Angle = _____   Type of Angle = _____

2)
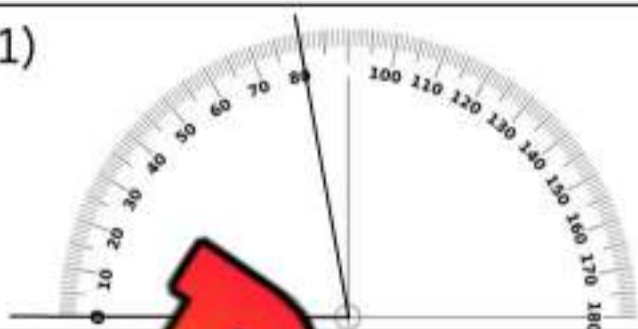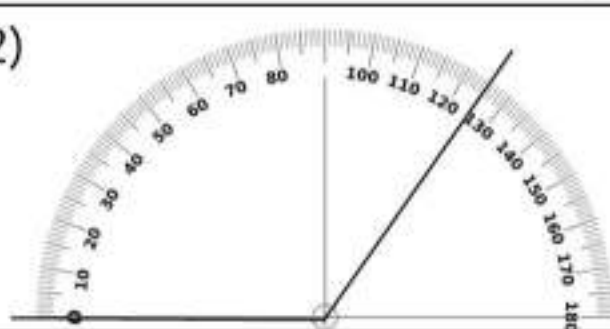
Angle = _____   Type of Angle = _____

Part 2	Measure the angles and label them <u>acute</u>, <u>right</u>, or <u>obtuse</u>

1)

3)

4)

5)

6)

7)

Part 3	Use a protractor to draw the angles below using the line provided

1)

_____
∠= 60°

2)

_____
∠= 98°

3)

_____
∠= 147°

42

Part 4   Use a protractor to draw the angles below

1)	2)	3)
∠7°	∠= 93°	∠= 145°

Part 5   ...e the angles and label the triangles <u>Acute</u>, <u>Obtuse</u>, or <u>Right</u>
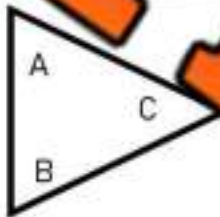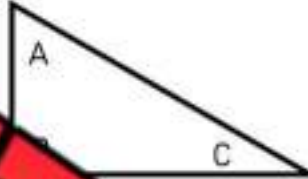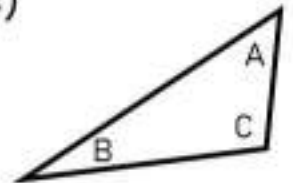
1) A C B	2)	3) A C	4) A C B
∠A=	∠A=	∠A=	∠A=
∠B=	∠B=	∠B=	∠B=
∠C=	∠C=	∠C=	∠C=

Part 6   Find the values of the unknown angle ...asu...

1) 64° A 44°	2) 67° 49° A	3) 54° B
A =	A =	A =
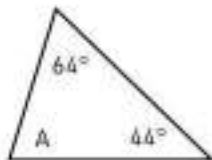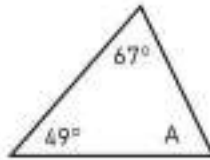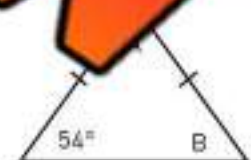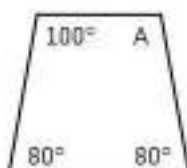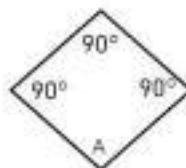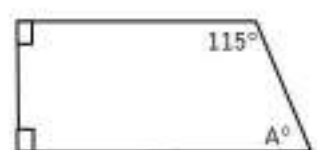
4) 100° A 80° 80°	5) 90° 90° 90° A	6) 115° A°
A =	A =	A =

Perimeter of Regular and Irregular Polygons

Part 1	Find the perimeter of the rectangles below

1) Perim_____ = _____

2) Perimeter= _____

3) Perimeter= _____

4) Perimeter= _____

5) Peri_____ = _____

6) Perimeter= _____

Part 2	Find the perimeter of the _____ons _____
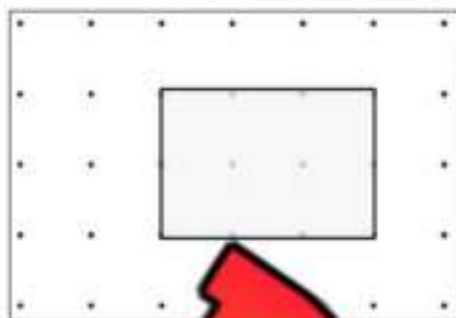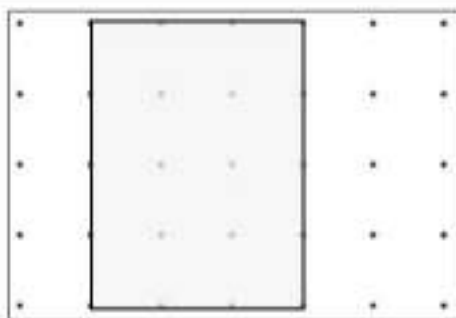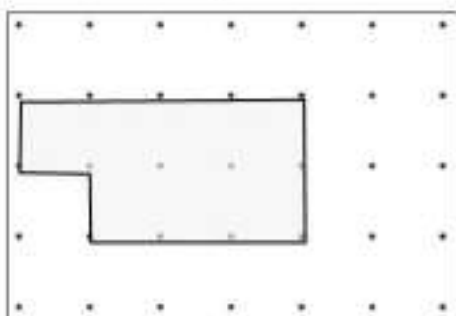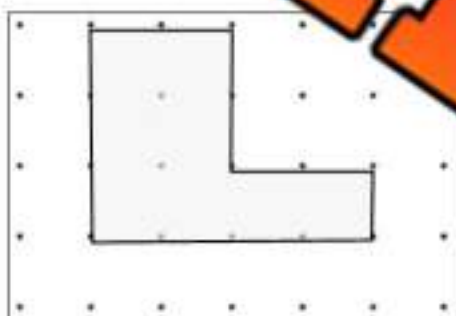
1) Perimeter= _____

2) Perimeter= _____

3) Perimeter= _____
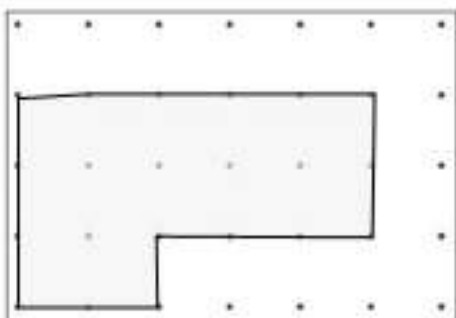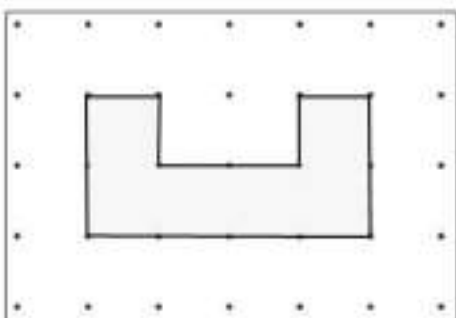
4) Perimeter= _____

5) Perimeter= _____
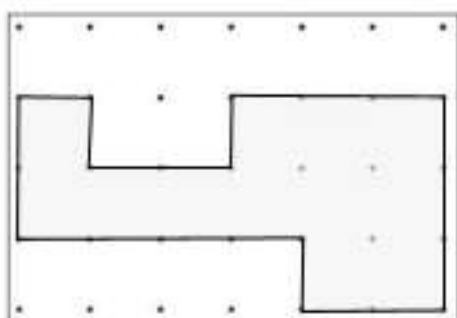
6) Perimeter= _____

Perimeter Formulas

Mathematicians use formulas to help them solve questions faster and easier. When finding the perimeter of a quadrilateral, we can use the following formulas.

Formula 1		Formula 2
$a + b + a + b$	3cm	$a + b \times 2$
$9 + 3 + 9 + 3 = 24$cm	9cm	$9 + 3 \times 2 = 24$cm

Question Use both formulas to calculate the perimeter of the quadrilaterals

	Formula 1	Formula 2
1) 5cm		
2) 5cm 11cm		
3) 7m 15m		
4) 14mm 22mm		
5) 4cm 17cm		
6) 7cm		

Perimeter of Regular Polygons

Part 1	Step 1 – Convert the units so they are all the same Step 2 – Use a formula to calculate the perimeter

1)

```
        30mm
   3cm         3cm
        30mm
```

2)

```
       10mm
  1cm □ 1cm
       10mm
```

3)

```
  50mm          0mm
          5cm
```

4)

```
          4mm
   4cm          4cm
          4mm
```
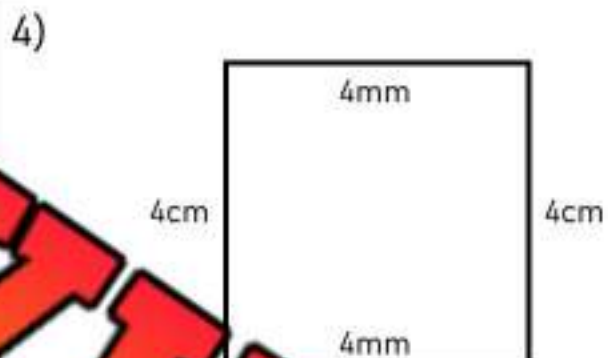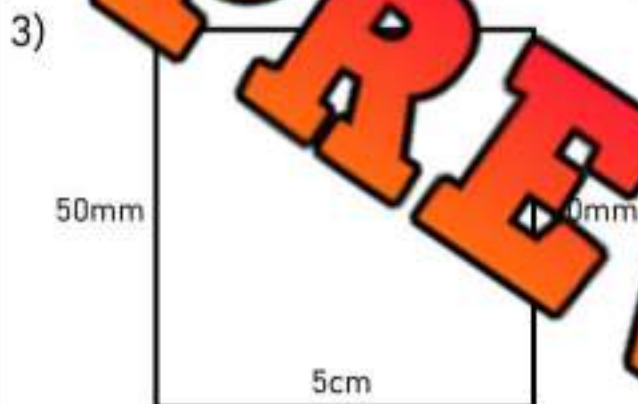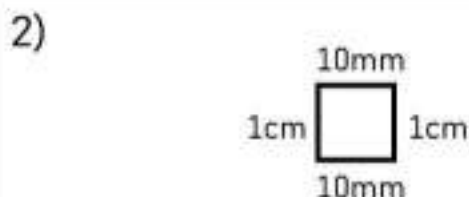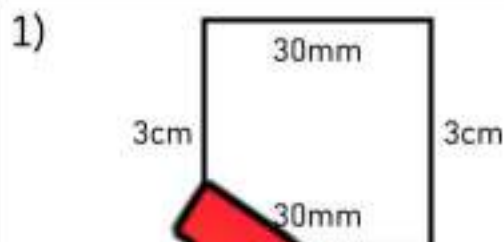
Part 2	Find the perimeter of the equilateral triangle

1)

```
       /\
50mm  /  \  50mm
     /____\
       5cm
```

2)

```
        /\
30mm   /  \  30mm
      /____\
        3cm
```

3)

```
        /\
40mm   /  \  40mm
      /____\
        4cm
```
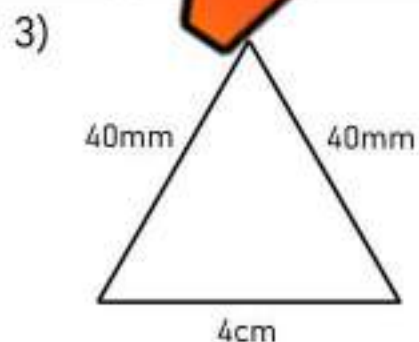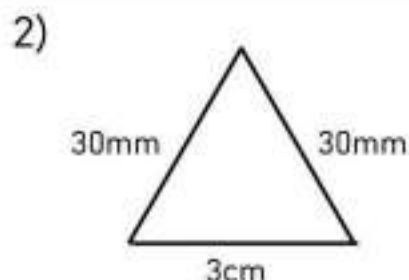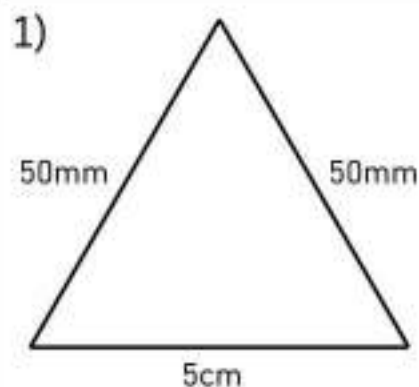
Perimeter Word Problems

| Questions | Draw a picture of the problem and then find the perimeter |

1) A computer screen is 91cm by 42cm. What is the perimeter of the screen?

2) Pa___ ___ ___ce around his yard. His yard is 67m by 49m. What is the per___ter o___ ___?

3) The school yard is a rectangle ___ ___ ___ 126m. What is the perimeter of the yard?

4) A piece of paper is 153mm by 104mm. What is the pe___ paper?

5) Mrs. Wilson is putting a border around her bulletin board. The board is 210cm by 1.32m. What is the perimeter of the bulletin board?

Regular and Irregular Polygons - Word Problems

Questions	Draw a picture of the problem and then find the perimeter

1) Henry built a fence using stones in his yard. The fence was shaped like a regular pentagon. The regular pentagon had side lengths of 13m. What is the perimeter of the shape?

2) Detective Carter _____ a cri___ ___ne in an irregular shape. The irregular shape had 6 s___ ___h ___ ___ing measurements: 9m, 28m, 16m, 35m, 12m, and 47m. What i___ ___tal ___ the perimeter?

3) Jayden ran a perimeter around his neighbourhood. The perimeter he ran around was a regular hexagon. Each side was 415m long. What is the distance Jayden ran?

Same Area - Different Perimeter

| Questions | Is it possible for a shape to have the same area and a different perimeter? |

1)

5m

4m

Peri~~meter~~: _____

Area: _____

2)

10m

2m

Perimeter: _____ m

Area: _____ m²

3)

20m

1m

Perimeter: _____ m

Area: _____ m²

4)

6cm
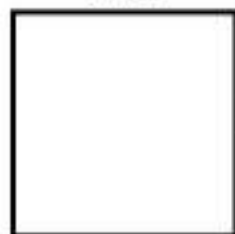
8cm

Perimeter: _____ cm

Area: _____ cm²

5)

4cm

Perimeter: _____ cm

Area: _____ cm²

6)

24cm
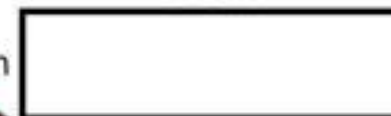
2cm

Perimeter: _____ cm

Area: _____ cm²

7)

10m

6m

Perimeter: _____ m

Area: _____ m²

8)

15m
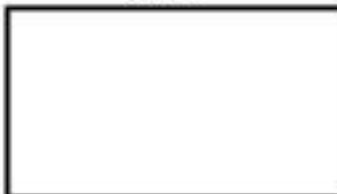
4m

Perimeter: _____ m

Area: _____ m²

9)

20m
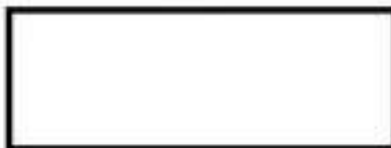
3m

Perimeter: _____ m

Area: _____ m²

Perimeter and Area

Questions | Does a larger perimeter mean a larger area? Answer the questions below

1) School Garden: A school wants to create two rectangular gardens with different dimensions. Garden A measures 15 meters by 5 meters, while Garden B measures 10 meters by 7 meters.

a) What is the perimeter of garden A?	
b) What is the perimeter of garden B?	
c) Which garden has a larger area to plant crops?	

2) Playground Fence: A neighborhood wants to build two rectangular playgrounds with different dimensions. Playground X has a length of 20 meters and a width of 8 meters, while Playground Y has a length of 16 meters and a width of 10 meters.

a) What is the perimeter of playground X?	
a) What is the perimeter of playground Y?	
c) Which playground has a larger area to play in?	

3) Classroom Carpets: A school needs to buy carpets for two rectangular classrooms with different dimensions. Classroom 1 measures 12 meters by 4 meters, and Classroom 2 measures 9 meters by 6 meters.

a) What is the perimeter of classroom 1?	
a) What is the perimeter of classroom 2?	
c) Which classroom will need the larger carpet?	

Metric System Units – Decimal Conversions

In Canada, we use the metric system. The metric system has 4 main units that we use to measure distances.

BENCHMARKS

Millimetre (mm)	Centimetre (cm)	Metre (m)	Kilometre (km)
15mm = 1.5cm 1500mm = 1.5m	150cm = 1.5m 1cm = 10mm	1.5m = 150cm 1500m = 1.5km	2.3km = 2300m

Part 1 — in the tables below

mm	cm
5	
15	
	2.5
	3.5
45	
55	
	6.5
75	
85	
	9.5

cm	m
	0.5
	1.5
250	
	4
550	
650	
	7.5
850	
950	

m	km
1500	
	3.5
5500	
7500	
	9.5
1500	
	15.5
	19.5

Part 2 — Convert the units of measurement below

1) 1.1m _____ cm

2) 42mm _____ cm

3) 3.7cm _____ mm

4) 9.3cm _____ mm

5) 8.12m _____ cm

6) 515mm _____ cm

7) 426mm _____ cm

8) 7.5cm _____ mm

9) 831cm _____ m

10) 75mm _____ cm

11) 6.89m _____ cm

12) 562cm _____ m

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

Kilo
1000
Units

Hecto
0 units

Deka
10 units

Basic Unit
Metres
Litres
Grams

Deci
0.1 Unit

Centi
0.01 Unit

Milli
0.001 unit

To convert to a smaller unit, move the decimal point to the right (multiply)
→

To convert to a larger unit, move the decimal point to the left (divide)
←
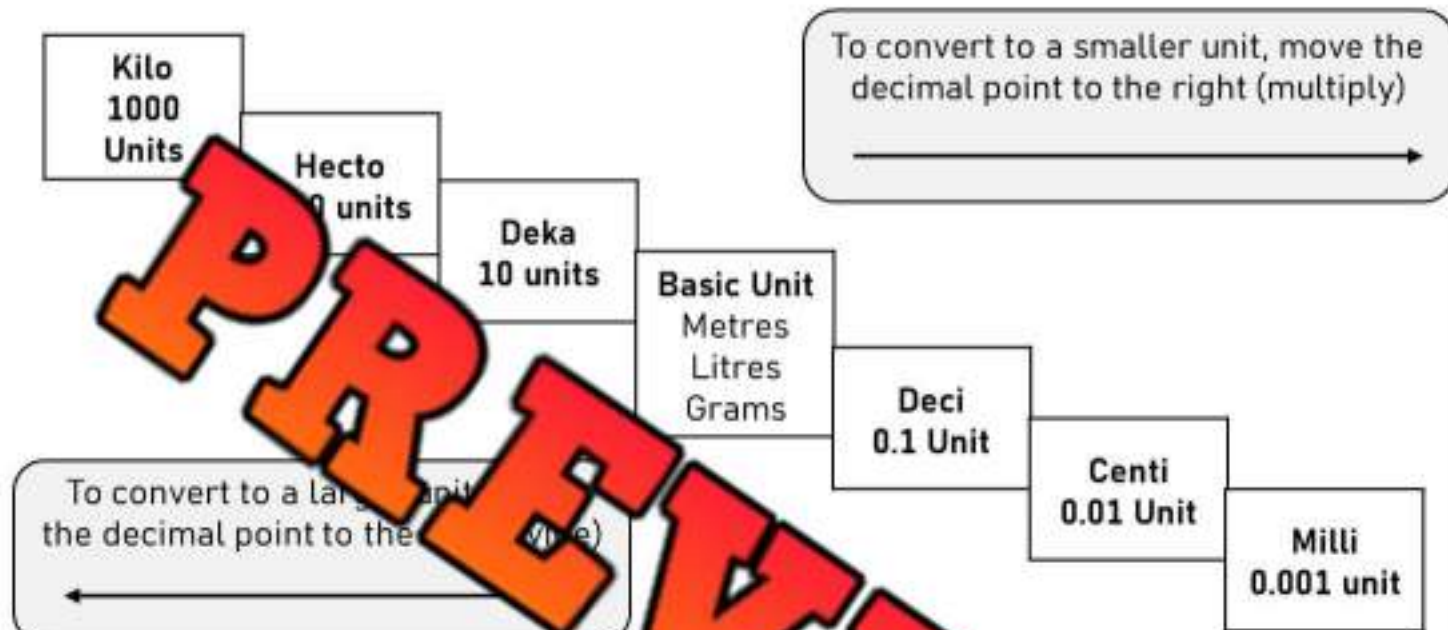
Instructions
1. Find your starting unit of measurement
2. Count the jumps to get to your ending unit of measurement.
3. Move the decimal the number of jumps up or down needed.
   Moving Up = Left and Moving Down = Right

EXAMPLE
_____ = _____ mm
(jumps down – move decimal 3 right)
_____ 5__8mm

Practice   Convert the units of measurement below

1) 2.8m	_____mm	5) 7.4km	_____m	9) 11 518m	_____km
2) 418mm	_____cm	6) 807m	_____km	10) 7921mm	_____m
3) 278cm	_____mm	7) 3045m	_____cm	11) 9.52m	_____mm
4) 277.5m	_____km	8) 5232cm	_____mm	12) 12cm	_____mm

Which is Longer?

| Part 1 | Put the lengths in order from <u>shortest</u> to <u>longest</u> |

1)	10.5m	200.2cm	10.5mm	0.14km

2)	312.5cm	3380mm	0.05km	300m

3)	_____mm	525cm	5.5m	0.5km

4)	883cm		8000mm	0.8km

| Part 2 | Read the problems and s____ ___em be____ |

1. Fred and Norm both walk to school. Fred ____ 1.32__ ____ Norm walks 1753m. Who walks further to school?

2. Nick and Ryan both competed in long jump at the track meet. Nic__ __mped 3.45m and Ryan jumped 329cm. Who jumped further?

3. Four friends measure the length of their feet. The results are: Cole (19cm), Ashton (0.22m), Ryker (210mm), and Xander (0.000205km). Rank the friend's feet in order from longest to shortest.

Area - Units Squared

When we calculate the area of a shape, we can use the following formula

A = base (b) x height (h)

height
base

b = 2 units
h = 2 units

A = l x w
A = 2 x 2
A = 4 units²
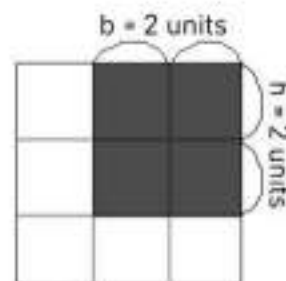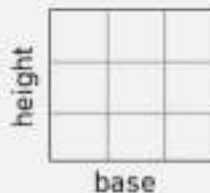
Question | Find the area of the shapes below
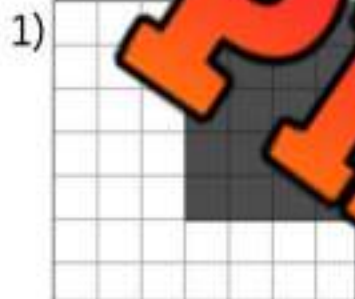
1)
A = b x h
A = __ x __
A = __ units²

2)
A = b x h
A = __ x __
A = __ units²

3)
A = b x h
A = __ x __
A = __ units²

4)
A = b x h
A = __ x __
A = __ units²

5)
A = b x h
A = __ x __
A = __ units²

6)
A = b x h
A = __ x __
A = __ units²
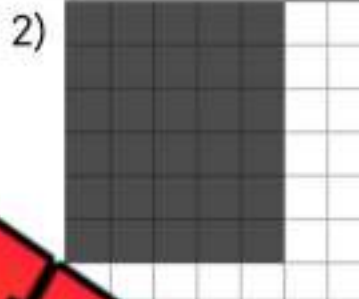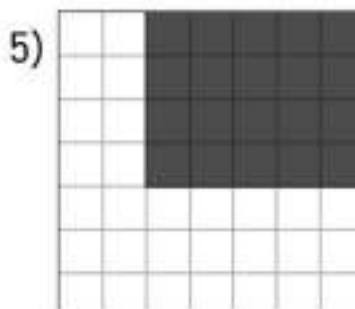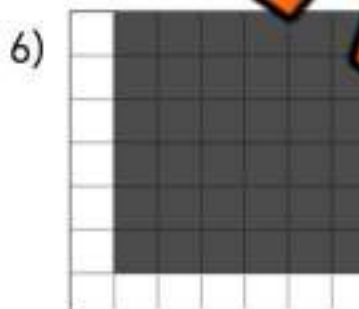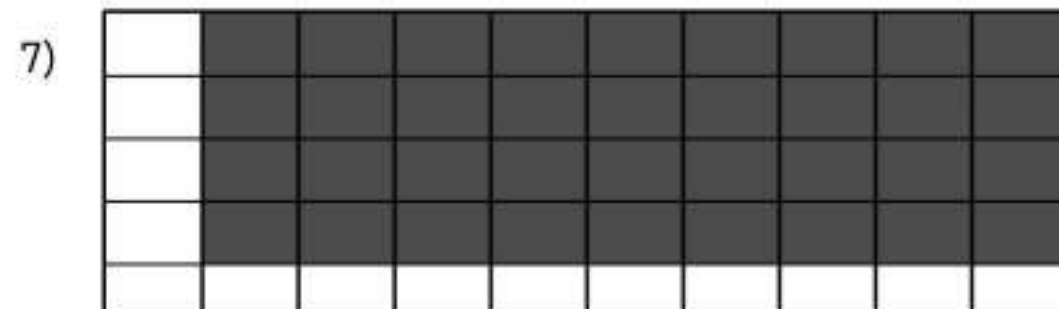
7)
A = b x h
A = __ x __
A = __ units²

Calculating Area Using CM

We can draw lines on shapes to segment them into cm squares. Try your best to make the squares equal.

5cm

2cm
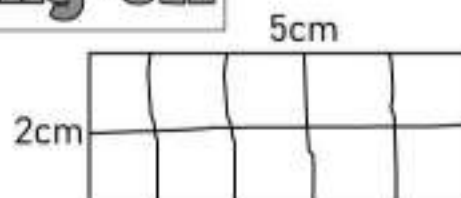
Questions | Draw lines in the shapes below to create cm squares. Then count the squares

1)
4cm

3cm

Area =

2)
6cm

2cm

Area = _____ cm²

3)
5cm

3cm

Area = _____

4)
6cm

4cm

Area = _____

5)
10cm

4cm

Area = _____

6)
5cm

6cm

Area = _____

PREVIEW
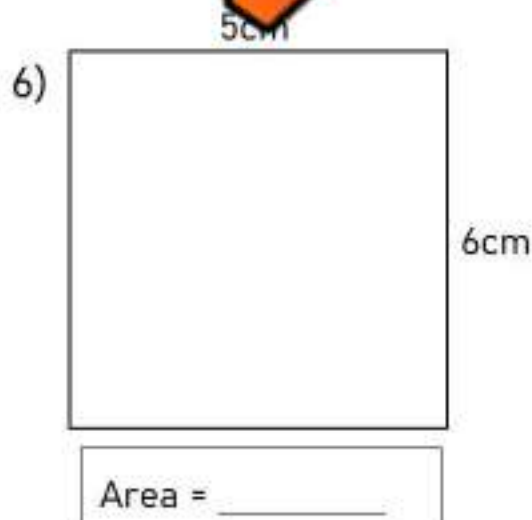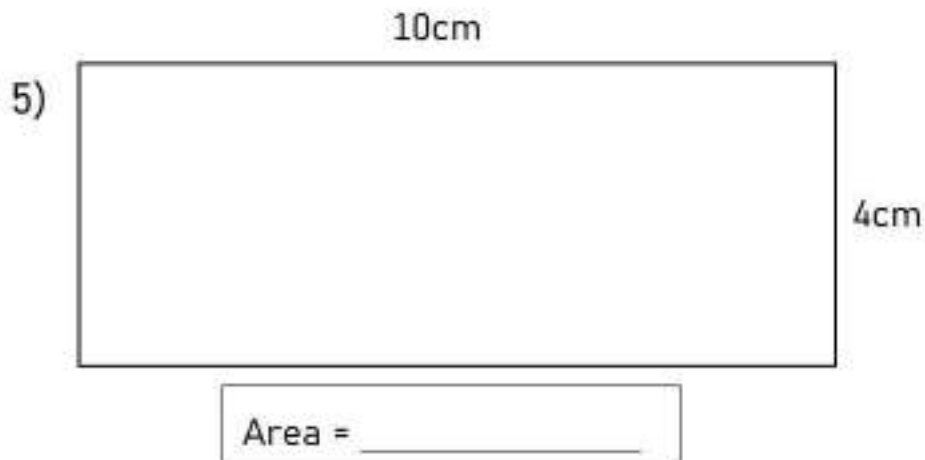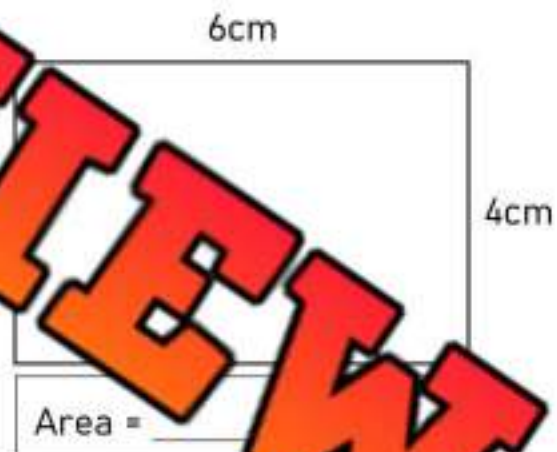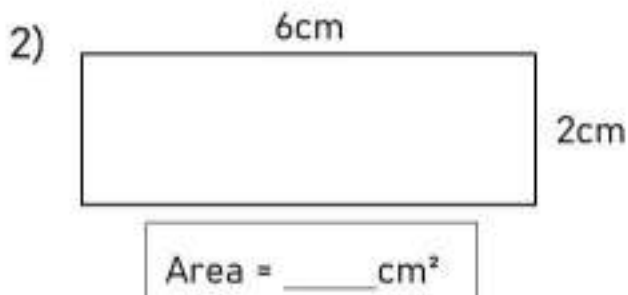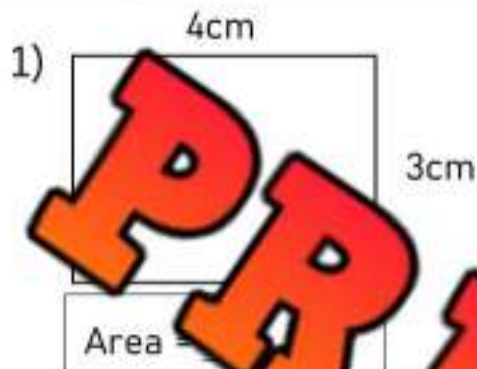
Finding the Area of Rectangles

Questions | Find the area (A= b x h) | *Not to Scale
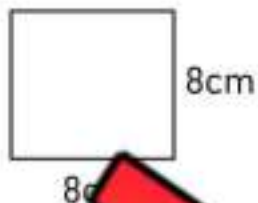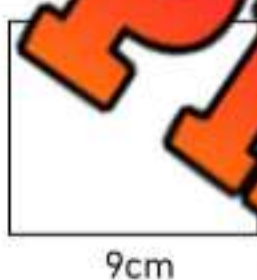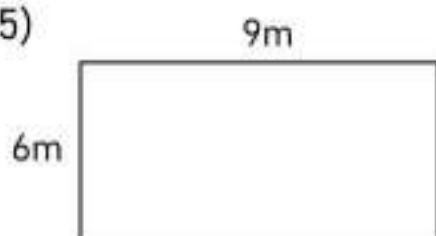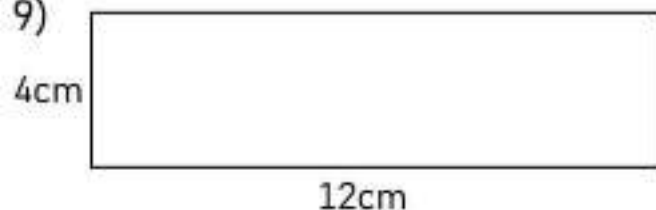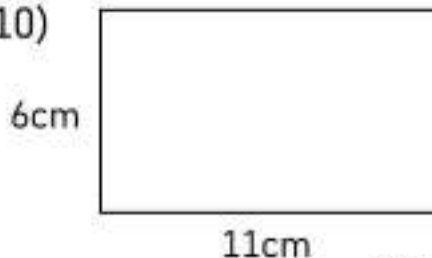
1)

8cm

8cm

Area = _____

2)

4m

9m

Area = _____

3)

9cm

Area = _____

4)

3cm

11cm

Area = _____

5)

9m

6m

Area = _____

7)

6cm

12cm

Area = _____

8)

9m

3m

Area = _____

9)

4cm

12cm

Area = _____

10)

6cm

11cm

Area = _____

Area Word Problems

1) A phone is 11cm by 60mm. What is the area of the phone?

2) A _____ 0cm. What is the area of the pool?
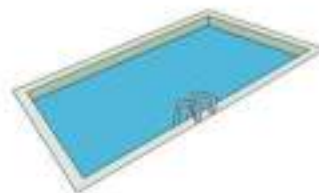
4) A candy wrapper is 40mm wide _____ ng. What is the area of the wrapper in cm?

4) The front of a square box is 12cm wide. What is the a_____ of the box?

5) A door is 3m by 150cm. What is the area of the door?

Finding the Missing Information

Questions Find the missing value (A= b x h)

1)

A=30cm²

5c

Base = _____

Height = _____

Area = _____

2)

3cm

A=21cm²

Base = _____

Height = _____

Area = _____

3)

A=48cm²

8cm

Base = _____

Height = _____

4)

11m

A=33m²

Base = _____

Height = _____

Area = _____

5)

4m

A=28m²

Base = _____

Height = _____

Area = _____

6)

A=36

Base = _____

Height = _____

Area = _____

7)

A=64cm²

8cm

Base = _____

Height = _____

Area = _____

8)

1m   A=12m²

Base = _____

Height = _____

Area = _____

9)

A=77cm²

11cm

Base = _____

Height = _____

Area = _____

10)

7cm   A=56cm²

Base = _____

Height = _____

Area = _____

Finding the Missing Information - Word Problems

| Questions | Use the information you have to find the missing height or base |

1) A piece of paper has an area of 63cm². The base of the paper is 7cm. What is the height of the paper?

2) Hud... ...ular quadrilateral. It has an area of 81m². What are the side lengt...

3) A bus has an area of 24m². ...heig... ...2m. What is the base?

4) A poster shaped like an irregular quadrilateral has a base of ... ...a of 126cm². What is the height of the poster?

5) A cookie sheet has an area of 104cm². The base of the sheet is 8cm. What is the height of the cookie sheet?

Calculating Volume - Blocks

Rectangular Prism - Calculating Volume

To find the volume of a rectangular prism, multiply the length by the width by the height.	4cm / 2cm / 5cm	$v = l \times w \times h$ $v = 5cm \times 2cm \times 4cm$ $v = 40cm^3$
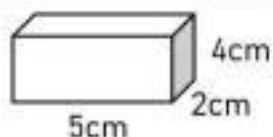
Questions   Label the rectangular prisms and then calculate the volume

1)

l = _____

w = _____

h = _____

v = _____

2)

l = _____

w = _____

h = _____

v = _____

3)

l = _____

w = _____

h = _____

v = _____

4)

l = _____

w = _____

h = _____

v = _____

5)

l = _____

w = _____

h = _____

v = _____

6)
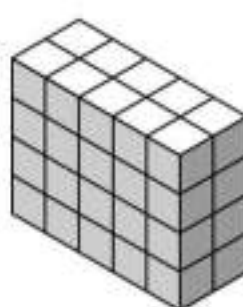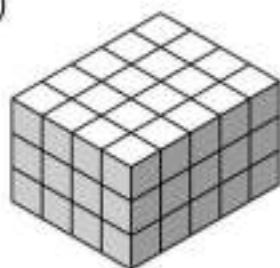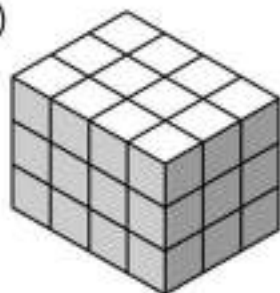
l = _____

w = _____

h = _____

v = _____

7)
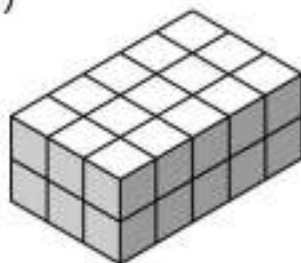
l = _____

w = _____

h = _____

v = _____

8)
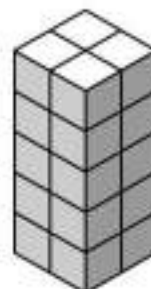
l = _____

w = _____

h = _____

v = _____

Calculating Volume of Rectangular Prisms

Rectangular Prism – Calculating Volume

To find the volume of a rectangular prism, multiply the length by the width by the height.	4cm 2cm 6cm	v = l x w x h v = 6cm x 2cm x 4cm v = 48cm³
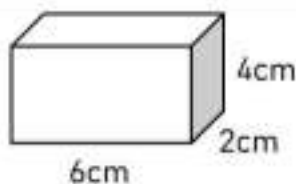
Question   Calculate the volume of the rectangular prisms

1) 11cm

2) 9cm 5cm 2cm

3) 4m 7m 10m

5) 4cm 2cm 13cm

6) 9cm

7) 5cm 2cm 6cm

8) 1m 4m 6m

9) 3m 8m 8m

10) 3m 4m 8m
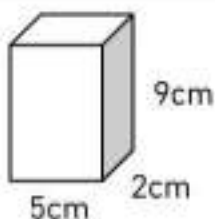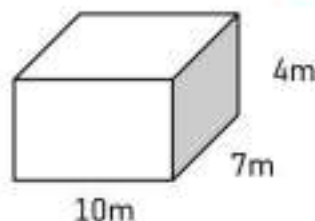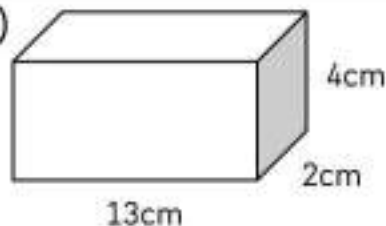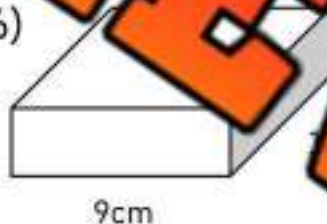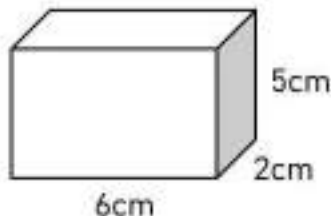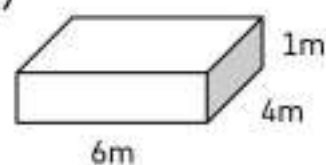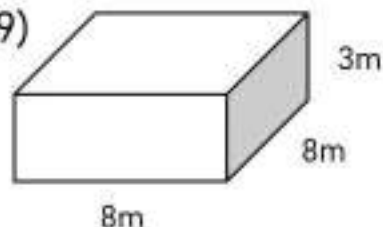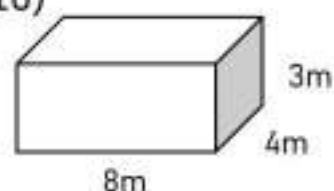
Calculating Volume of Rectangular Prisms

Part 1 | A variety of small boxes are used for packaging. Find the volume of each box

Box Type	Length	Width	Height	Volume
Box 1	9cm	6cm	2cm	
Box 2	7cm	5cm	10cm	
Box	5cm	8cm	3cm	
Box		9cm	3cm	
Box 5		8cm	6cm	
Box 6			8cm	
Box 7	7cm		4cm	

Part 2 | Calculate the volume of the rectangular prisms

1) 8m, 3m, 9m

2) 5cm, 6cm

3) 4m, 6m, 9m

4) 3cm, 11cm, 5cm

5) 6cm, 4cm, 10cm

6) 3cm, 9cm, 7cm
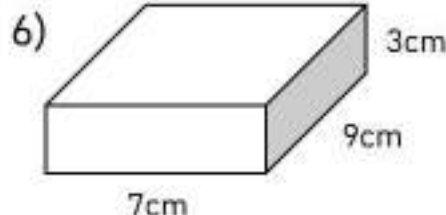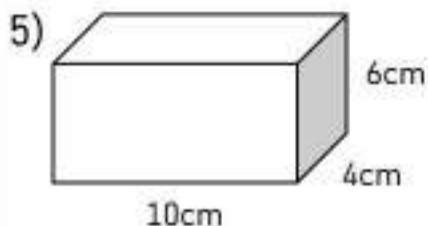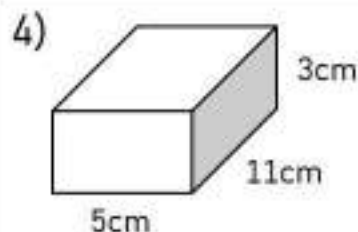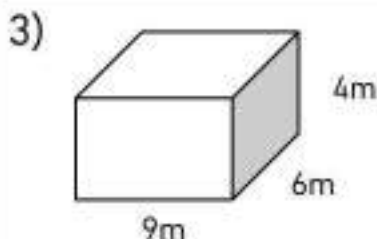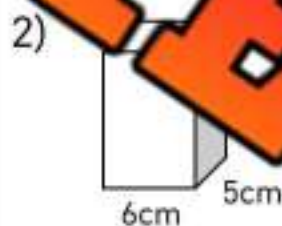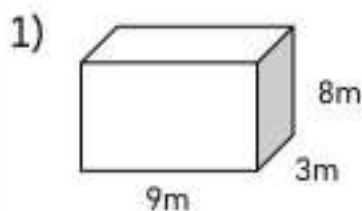
Calculating Volume of Rectangular Prisms

Questions | Solve the word problems below

1) A classroom has a width of 12m, height of 2m, and a length of 10m. What is the volume of the classroom?

2) A[n] [elevator] [i]s [___] [ta]ll, 2m deep, and 4m long. What is the volume of the elevat[or]?

3) A block has a height of 7cm, wi[dth of ___cm, and] a length of 10cm. What is the volume of the block?

4) A pool is 9m long, 6m wide, and 3m deep. What is the v[olume of the] pool?

5) A lunchbox is 12cm wide, 7cm tall, and 10cm deep. What is the volume of the lunchbox?

Calculating Volume Using the Base

Questions | Fill in the blanks to investigate the area of the base and the height

1)

Area of ~~Base~~ Height		Volume 18

2)
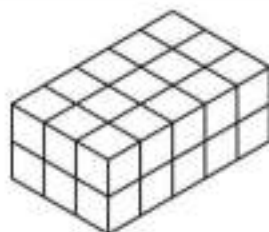
Area of Base	Height	Volume

3)

Area of Base	Height	Volume

4)
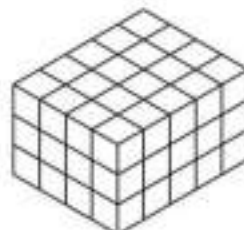
Area of Base	Height	Volume

5)
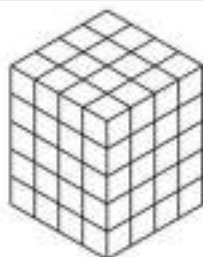
Area of Base	Height	Volume

6)

Area of Base	Height	Volume

7)
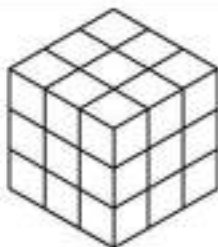
Area of Base	Height	Volume

8)
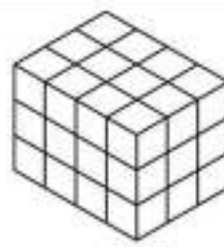
Area of Base	Height	Volume

Calculating Volume Using the Base

Part 1	Fill in the blanks to investigate the area of the base and the height

	Area of Base	Height	Volume
1)	10 cm²		80 cm³
2)	13 mm²	6 mm	
3)		5 cm	75 cm³
4)		8 mm	96 mm³
5)		9 m	
6)	1_		144 mm³
7)			132 km³
8)	15 m²		210 m³

Part 2	Answer the questions

1)	A box of cereal has a base with a length of ___ a w___ of 9cm. The height of the box is 22cm. What is the ___ne box?
2)	A juice box is 9cm wide and 5cm long. The height of the juice box is 12cm. What is the volume of the juice box?
3)	A railway car is 6.5m long and 2.2m wide. The railway car is 3.1m tall. What is the volume of the railway car?

Unit Quiz - Perimeter, Area, Volume

Part 1 | Use a formula to find the perimeter and area of the rectangles below

Shape	Perimeter	Area
1) [rectangle, 4cm]		
2) [rectangle, 12...]		
3) [rectangle, 20m]		

Part 2 | Answer the word problems be...

1) Lucas built a wood fence in his yard. The fenc... ...d like ...ular pentagon. The regular pentagon had side lengths of ... ...at is ...ngth of the fence?

2) Detective Roberts taped off a crime scene in an irregular shape. The irregular shape had 7 sides with the following measurements: 14m, 9m, 27m, 15m, 32m, 12m, and 47m. What is the distance of the perimeter the detective taped off?

| Part 3 | Fill in the blanks to investigate the area of the base and the volume |

1)
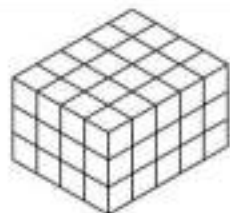
Area of Base	Height	Volume

2)
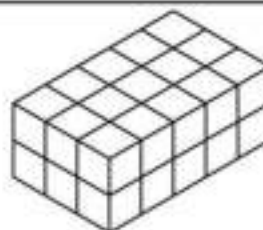
Area of Base	Height	Volume

| Part 4 | Fill in the blanks to investigate the area of the base and the volume |

	Area	Height	Volume
1)			110 cm³
2)	15 mm	mm	
3)			96 cm³
4)		1 mm	132 mm³

| Part 5 | Calculate the volume of the rectangular base below – l x w x h |

1)
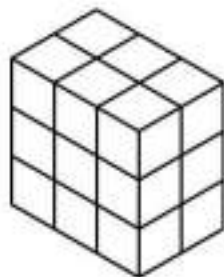
2)

3)
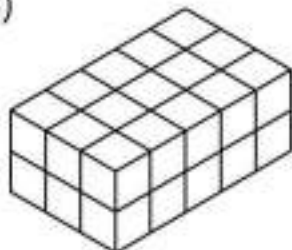
4)
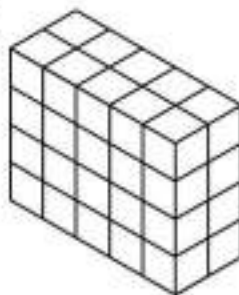
Part 6 — Calculate the volume of the rectangular prisms

1)

5cm
3cm
10cm

2)

1m
4m
5m

3)

3m

4)

3cm
9cm
6cm

5)

2cm
12cm

6)

2cm
11cm
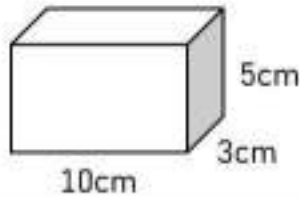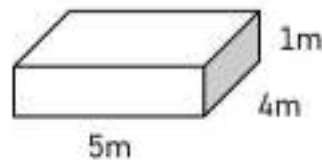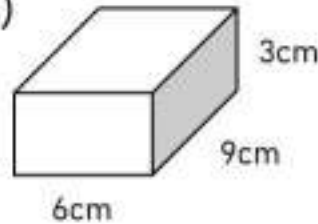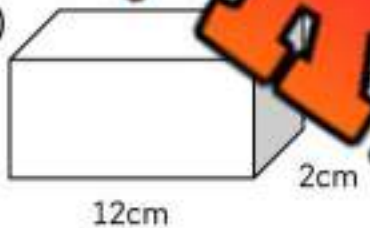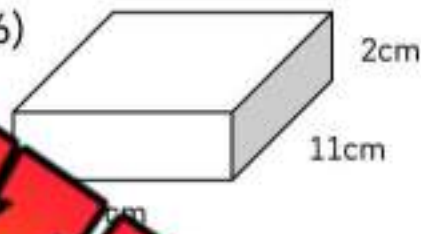
Part 7 — Answer the word problems b...

1) A closet has a height of 2m, a length of 3m, a... ...is the volume of the closet?

2) A block is 9cm wide, 6cm tall, and 11cm long. What is the volume of the block?

Performing Translations

Questions | Draw the new shape after reading the 3 steps

1) 3 ↑, 4 _____
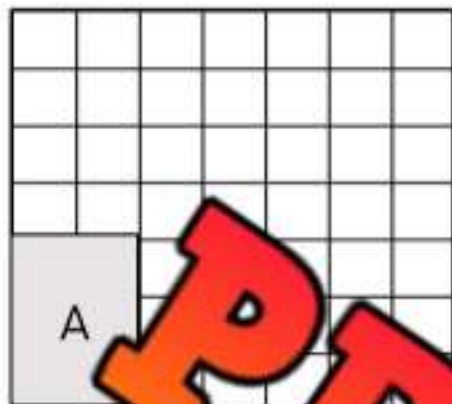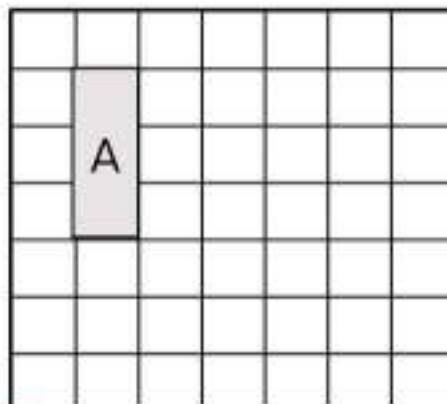
2) 3 ↓, 4 →, 1 ↓ _____
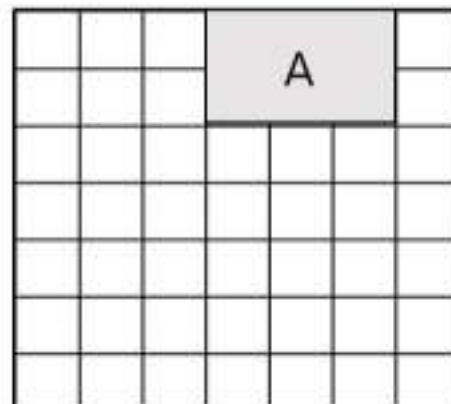
3) 3 ↓, 2 ←, 2 ↓ _____
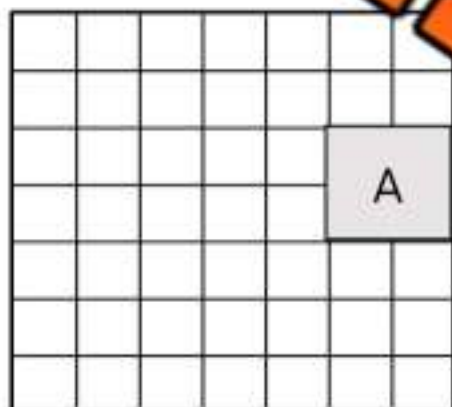
4) 3 ↓, 4 ←, 1 ↑ _____

5) 2 ↓, 4 →, 3 ↑ _____
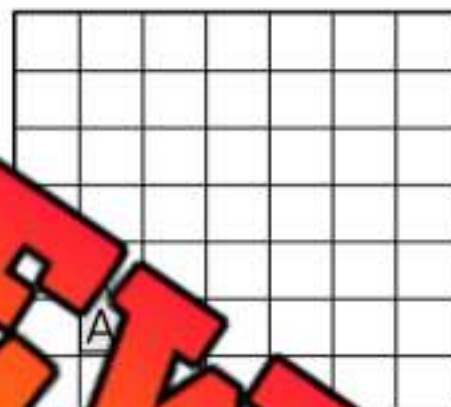
6) _____ 1 ↓ _____
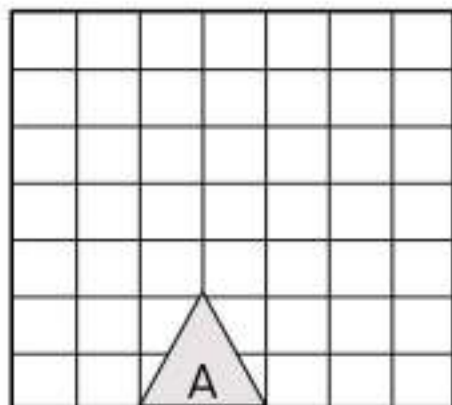
7) 4 ↑, 2 →, 3 ← _____
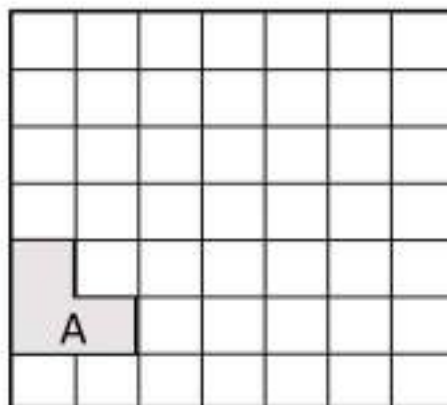
8) 4 ↑, 4 →, 5 ↓ _____
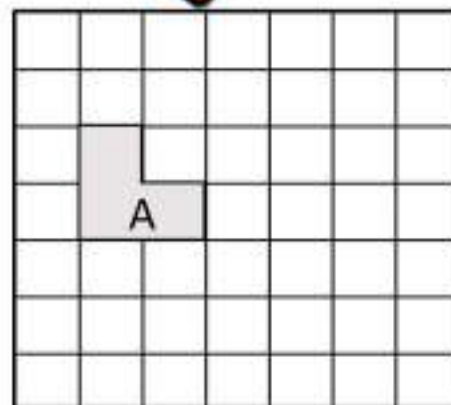
9) 3 ↓, 3 →, 2 ↑ _____

Translating Shapes - Cartesian Plane

1) Left

2) Right 5, down 4

3) Left 6, up 2

4) B
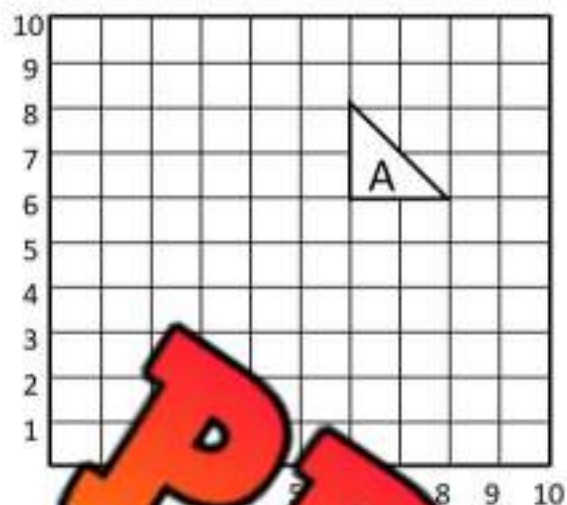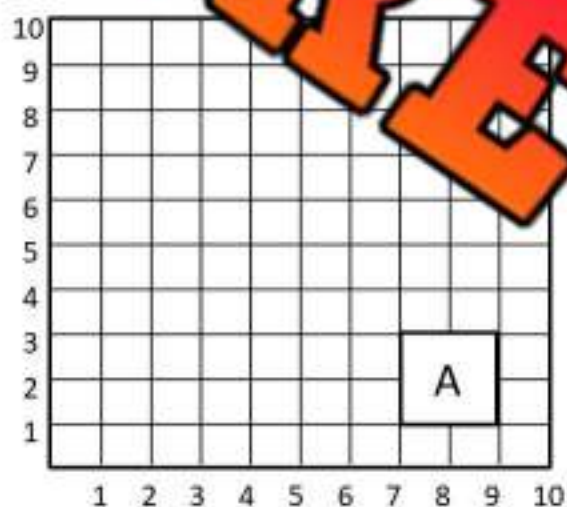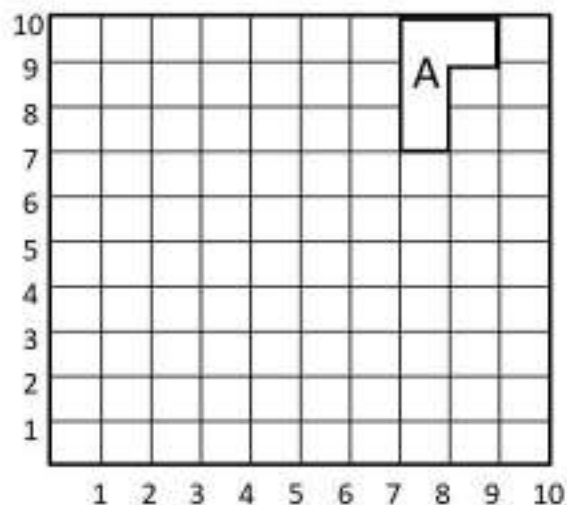
5) Left 3, down 6
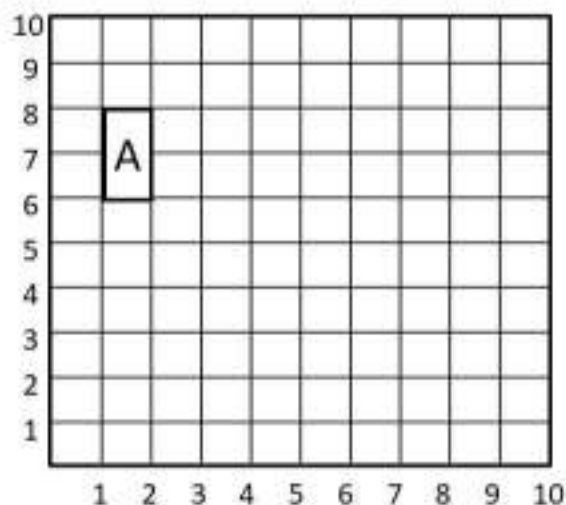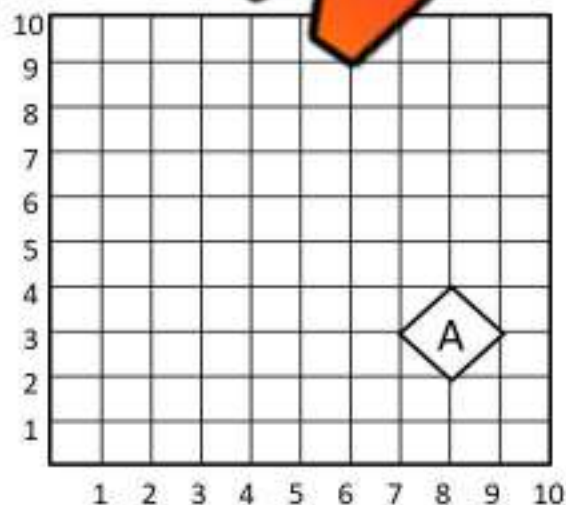
6) Left 2, up 4

Describing Translations - Cartesian Plane

Instructions: Describe the translations below. Shape A is the original shape.
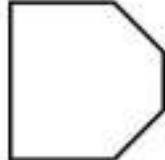

1)

2)

3)

4)

5)
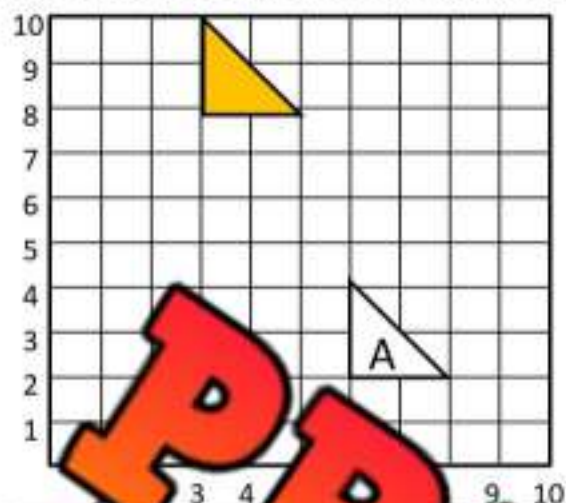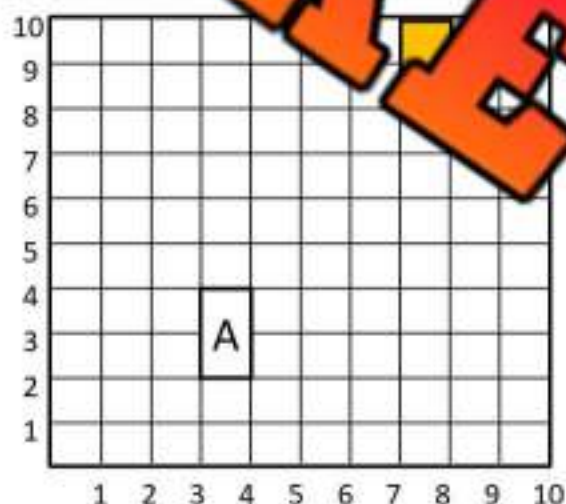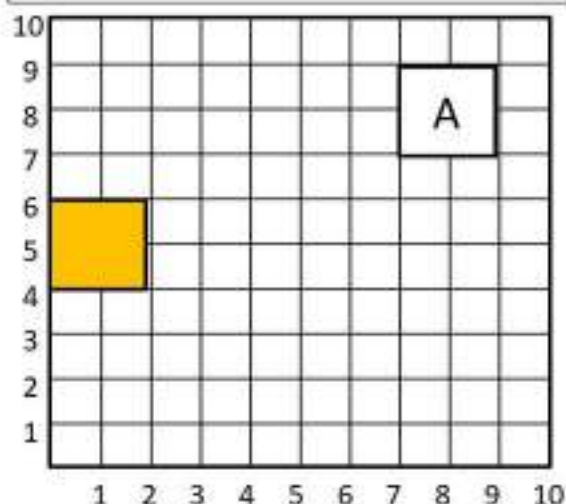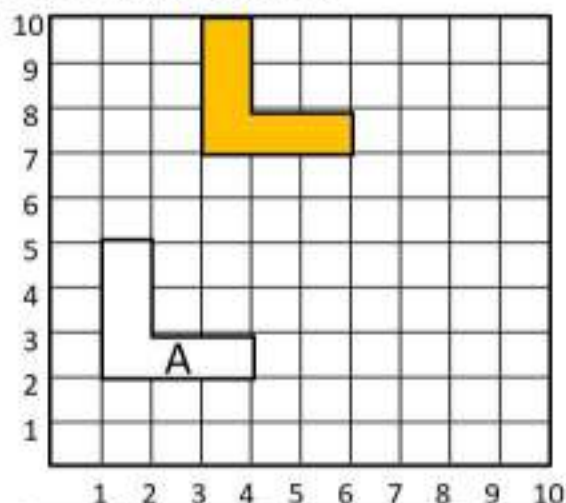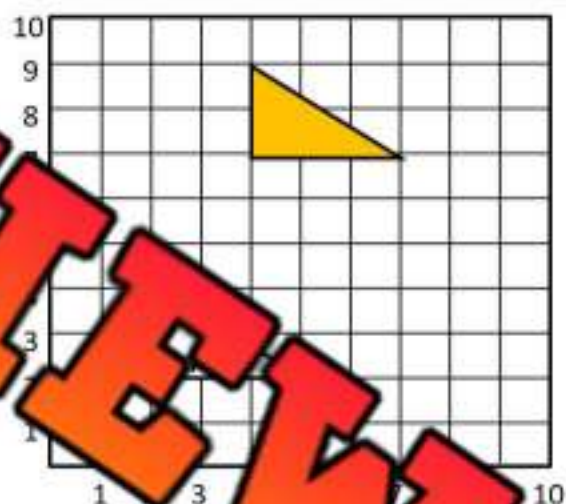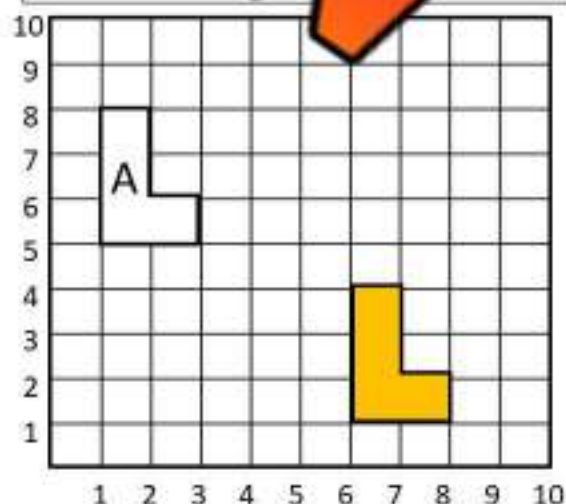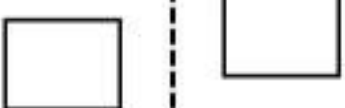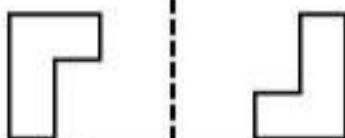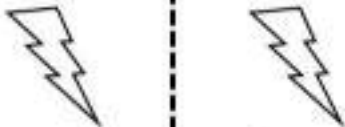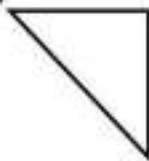
6)

Reflection or Not?

Part 1 | Is the transformation a reflection? <u>Yes</u> or <u>no</u>?

1)

yes

2)

3)

4)

5)

6)

7)

9

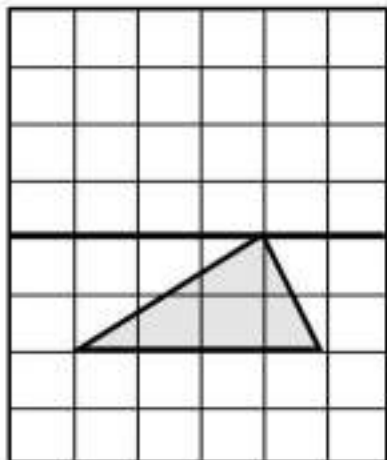**Part 2** | Draw the shape across the reflection line

1)

2)

4)

5)

6)

7)

8)

9

Name: _____   80

Drawing Reflections

Questions | Reflect the shapes across the mirror line
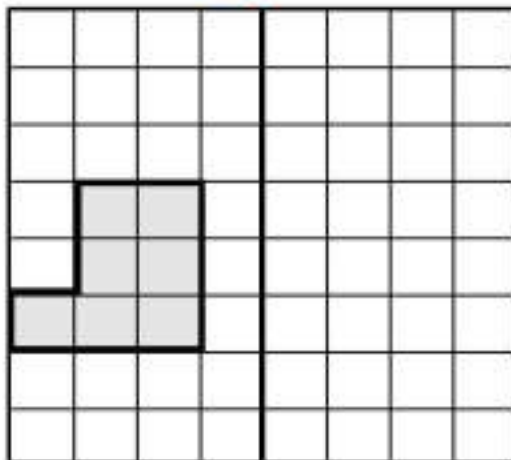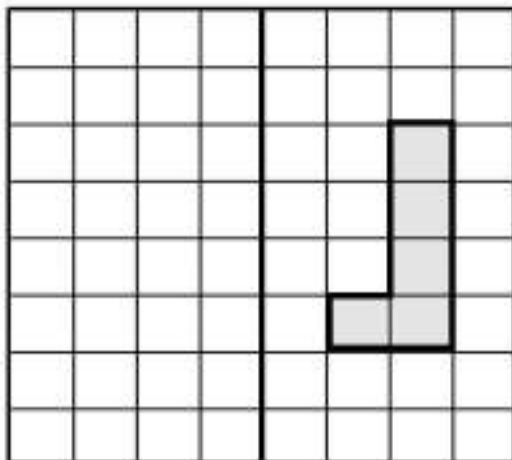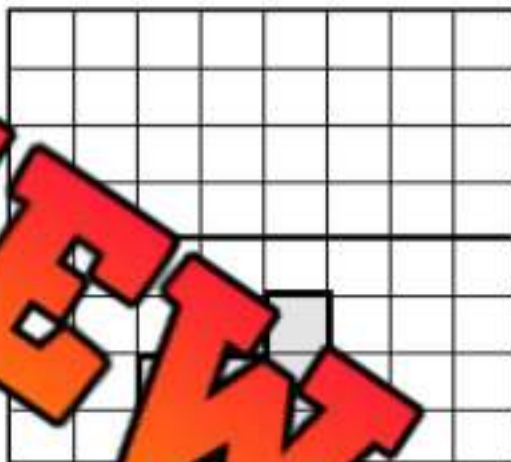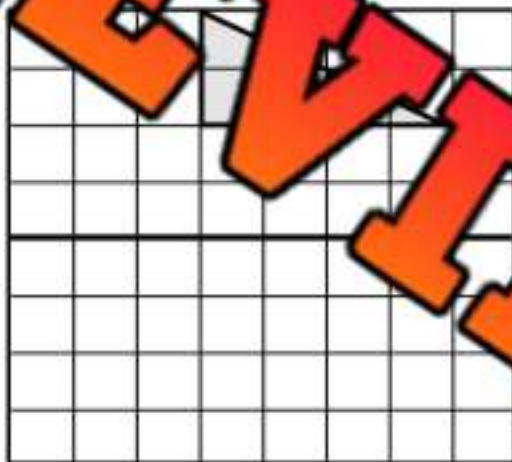
Reflecting Shapes - Cartesian Plane

Questions Reflect the shapes across the mirror line

1)

2)

3)

4)

5)

6)
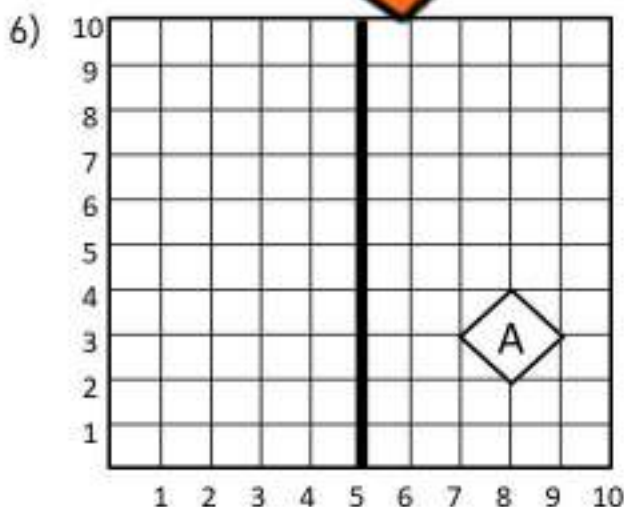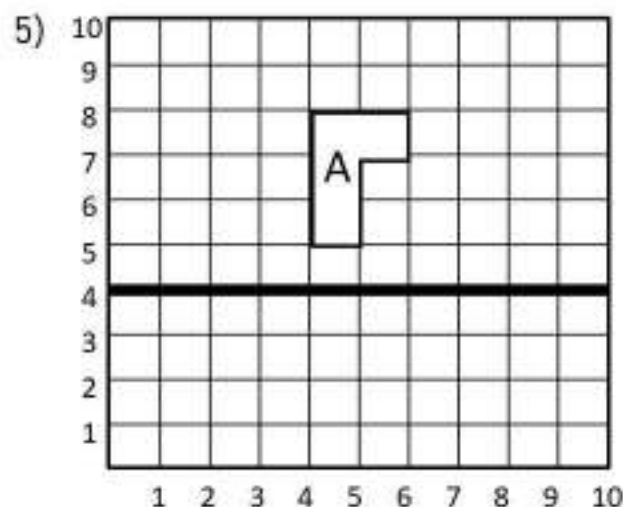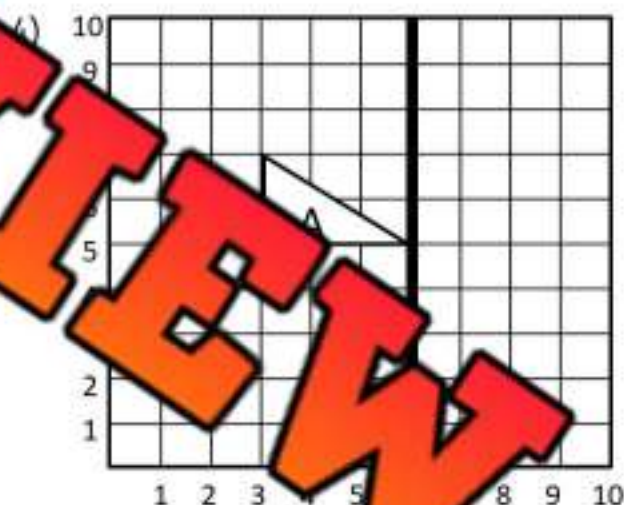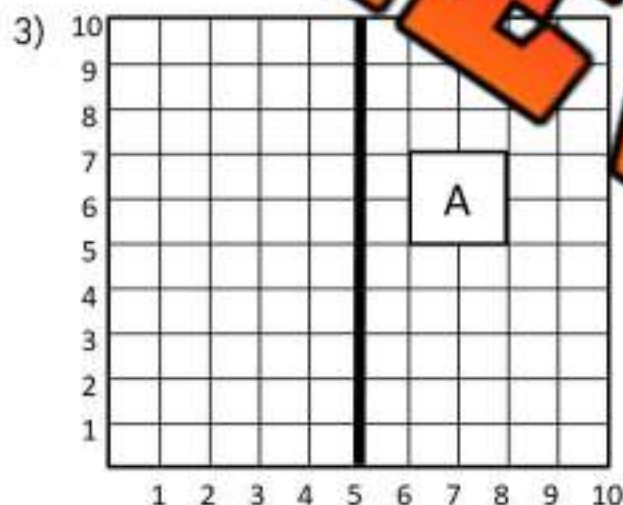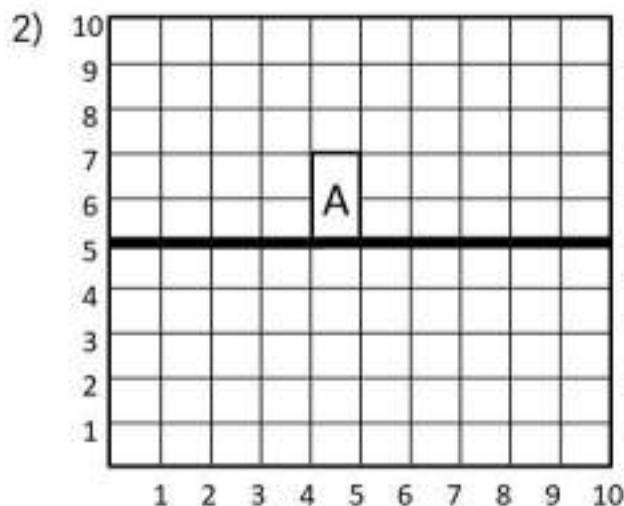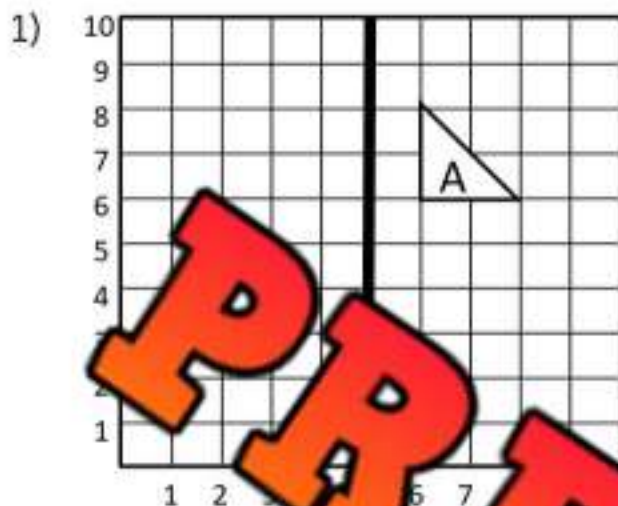
Clockwise and Counterclockwise Rotations

Rotations can either be <u>clockwise</u> or <u>counterclockwise</u>.

A **<u>clockwise</u>** rotation moves the same way the minute, second, and hour hands move on a clock.

A **<u>counterclockwise</u>** rotation moves the opposite way of a clockwise turn.
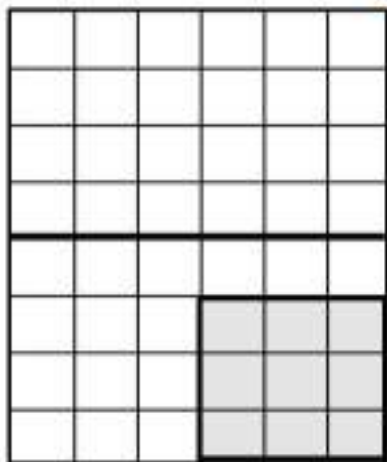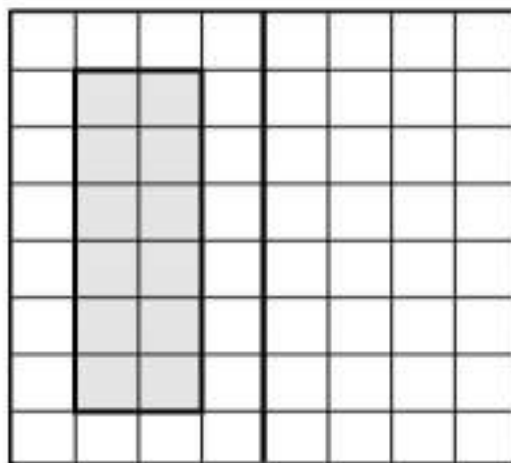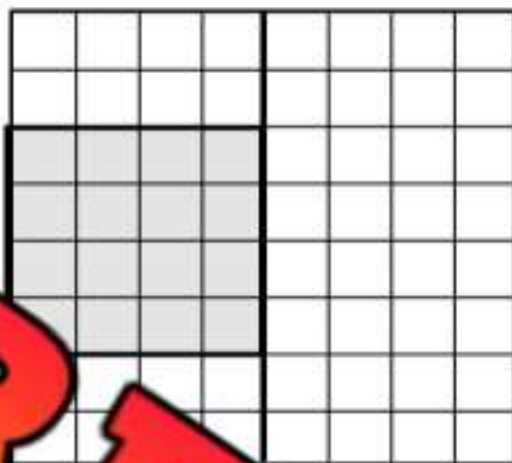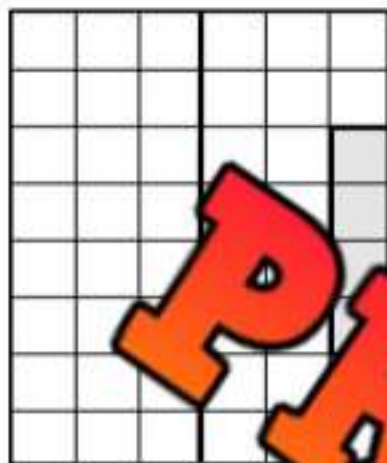
We can rotate things a lot or a little. Check out the three turns below.

Clockwise

Counter-clockwise

360° rotation

180° rotation

90° rotation

Clockwise
90° rotation

_____wise/Counterclockwise
90° rotation

Clockwise/Counterclockwise
360° rotation
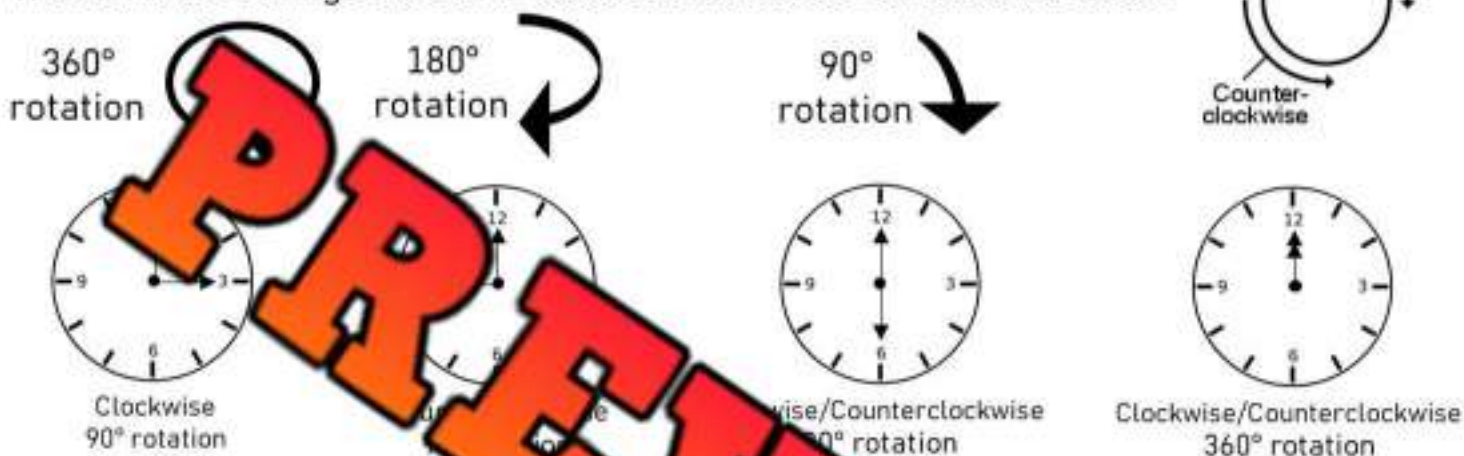
| Part 1 | Draw how the arrow _____ on th_____ |

1)

Clockwise
90° rotation

2)

Counterclockwise
360° rotation

Counterclockwise
90° rotation

4)

_____ckwise
_____0° rotation

| Part 2 | Describe how the arrow turned on the clock |

_____

_____

_____

_____
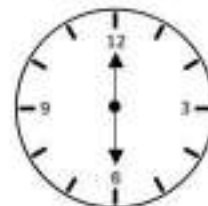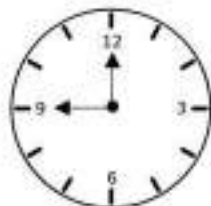
Clockwise and Counterclockwise Rotations

360° rotation

180° rotation

90° rotation

Clockwise
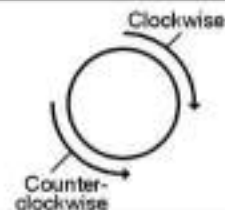
Counter-clockwise

Questions	Draw the controller after it has been rotated

1)		Clockwise 180° rotation	
2)		Counterclockwise 90° rotation	
3)		Clockwise 90° rotation	
4)		Counterclockwise 360° rotation	
5)		Clockwise 360° rotation	
6)		Counterclockwise 180° rotation	

Describing Rotations

Questions | Describe the rotations. Shape A is the original shape

1) _____
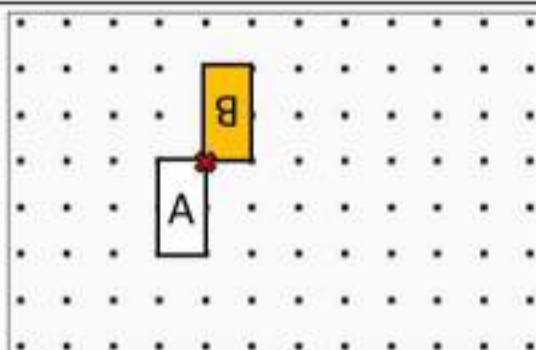
2) _____

3) _____
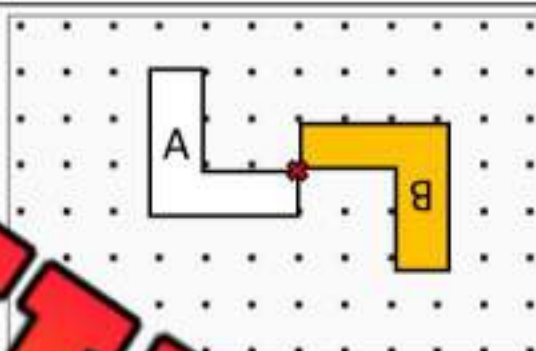
4) _____
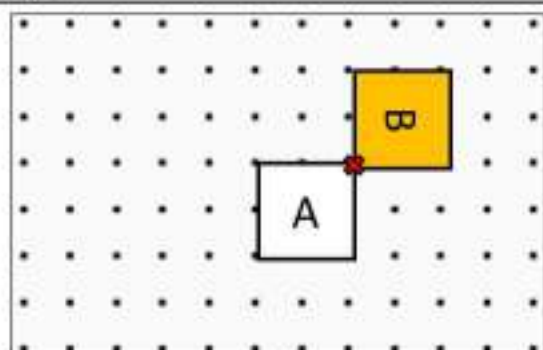
5) _____

6) _____
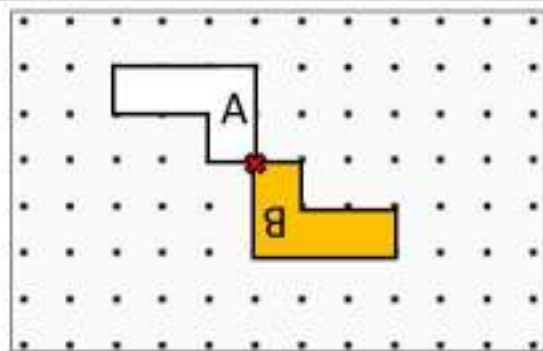
7) _____
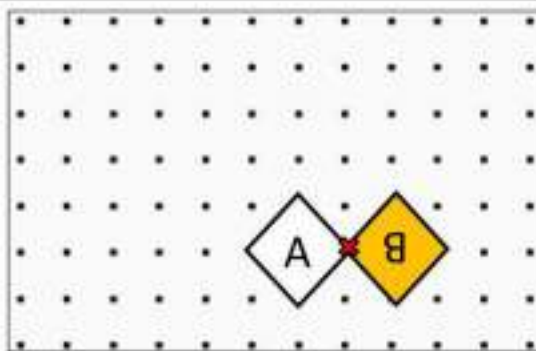
8) _____

Rotating Shapes - Cartesian Plane

1) 18 (PREVIEW)
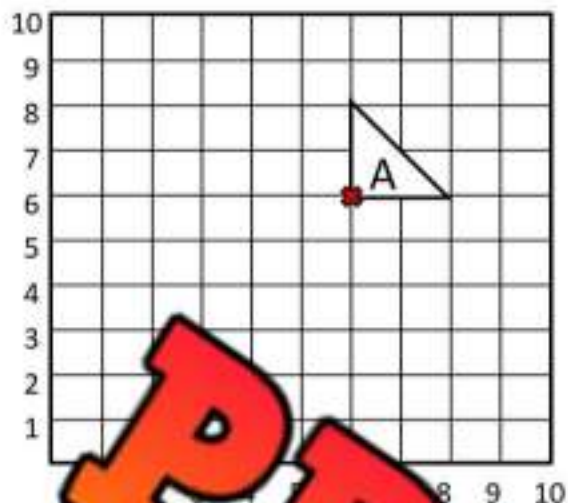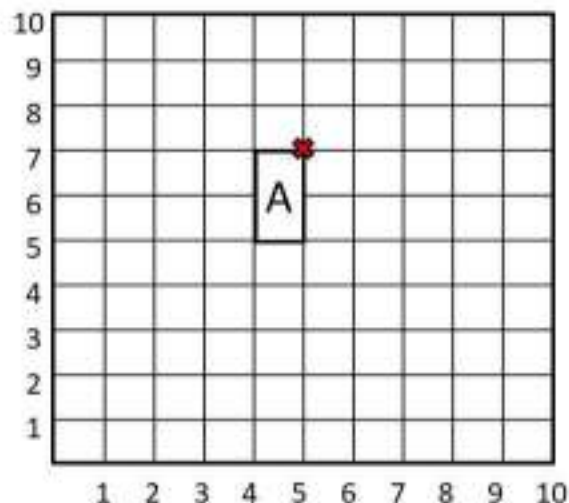
2) 90° counter-clockwise rotation
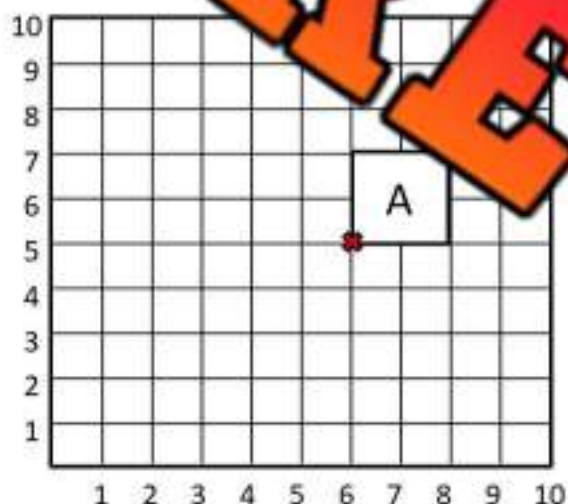
3) 90° clock-wise rotation
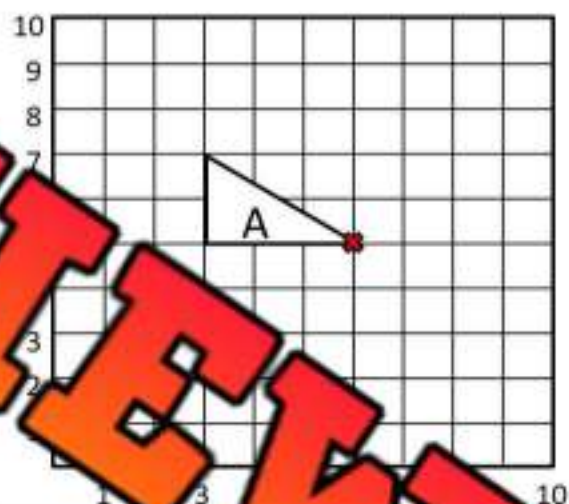
4) 90° cl... ...n
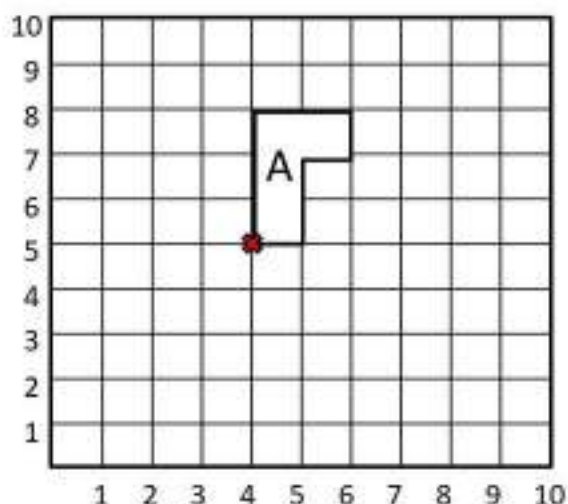
5) 180° rotation
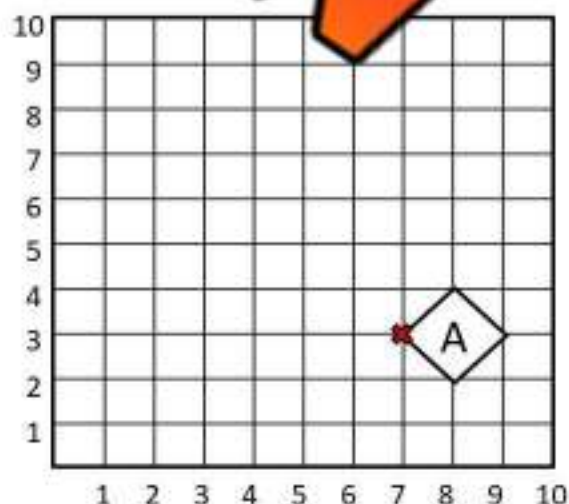
6) 90° counter-clockwise rotation

Transformations - Congruency

Questions — Are the shapes congruent? Which transformation is it?

1)
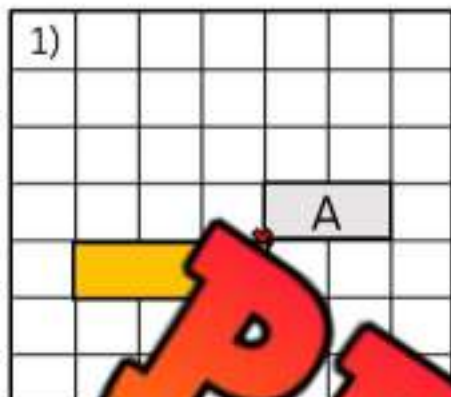
Congruent	Yes	
Type		

2)

Congruent	Yes	No
Type		

3)
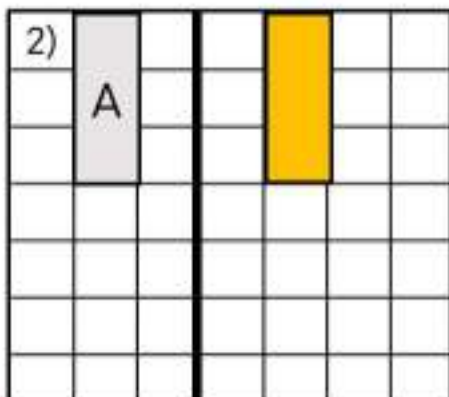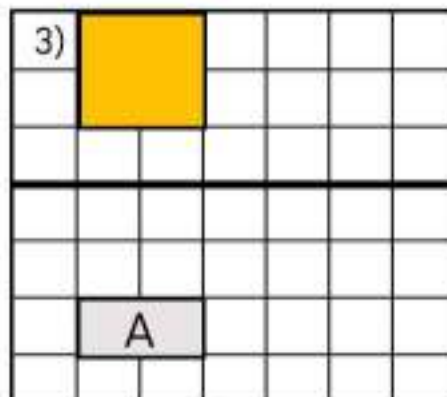
Congruent	Yes	No
Type		

4)
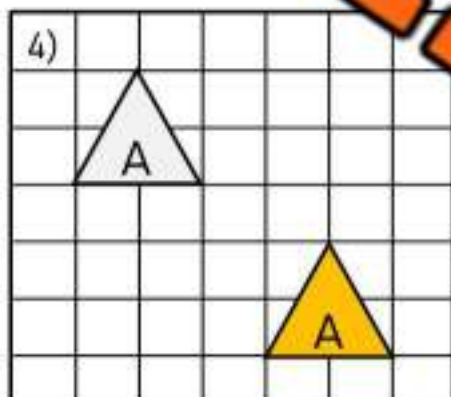
Congruent	Yes	No
Type		

5)

Congruent	Yes	No
Type		

6)
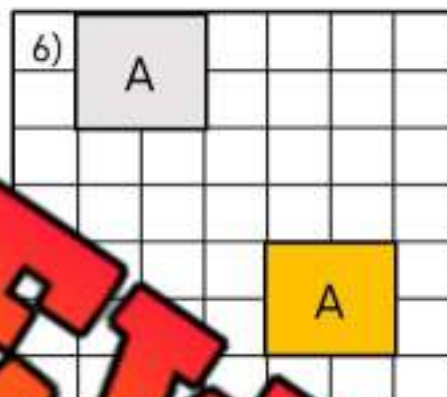
Congruent		No

7)
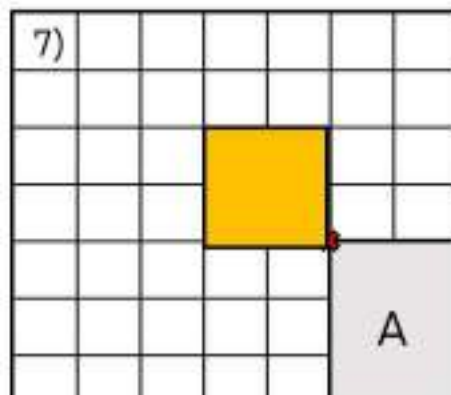
Congruent	Yes	No
Type		

8)
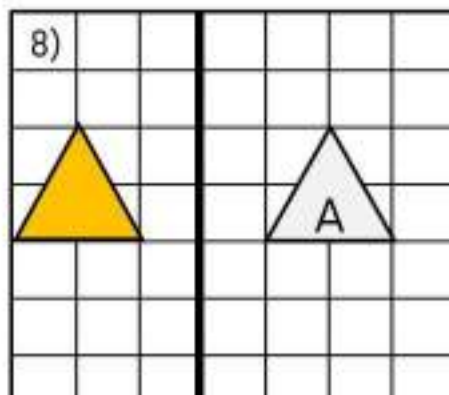
Congruent	Yes	No
Type		

9)
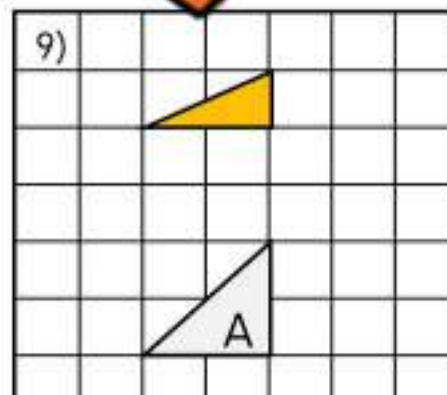
Congruent	Yes	No
Type		

PREVIEW

Performing Multiple Transformations

Questions | Complete the following combination of transformations
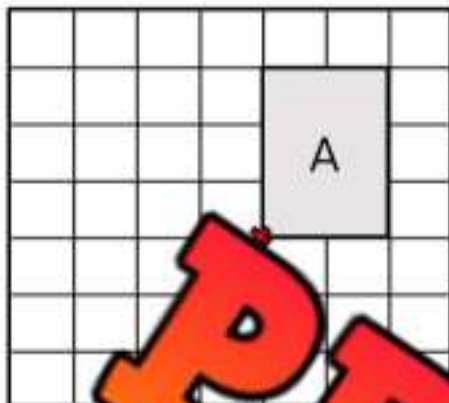
1) 180° rotation, translate up
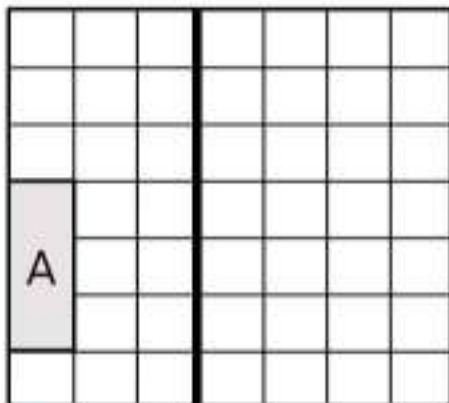
2) reflect, translate up 3
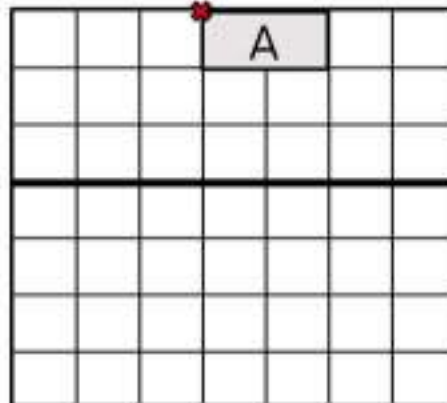
3) rotate 90° counterclockwise, reflect
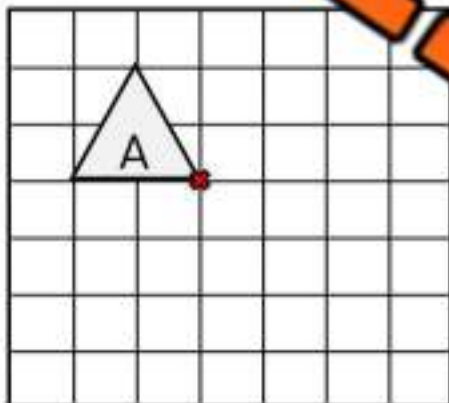
4) 90° clockwise rotation, translate left 2

5) Translate up 3, reflect
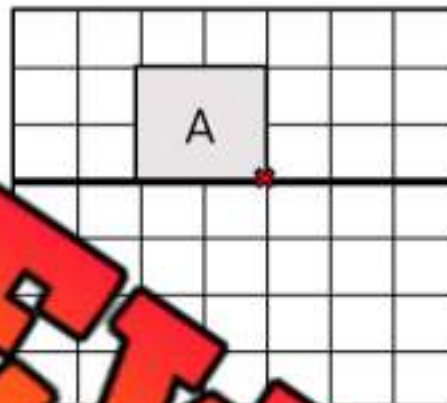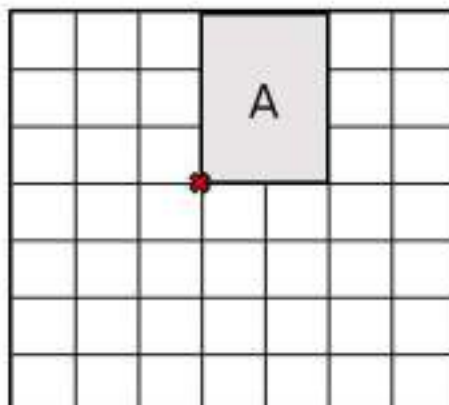
7) 180° rotation, translate right 3
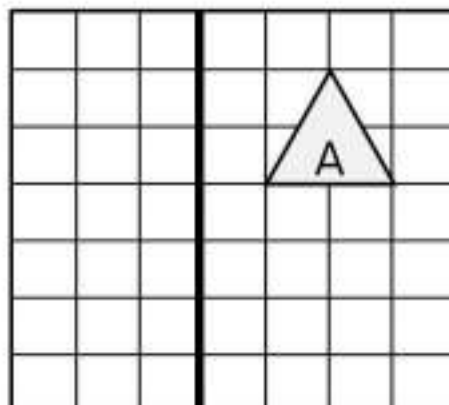
8) Reflect, translate down 3
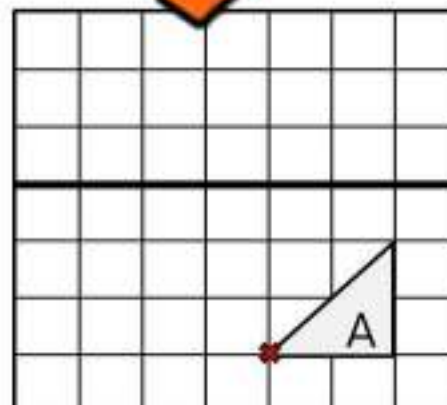
9) Rotate 90° counterclockwise and reflect

Describing Transformations in a Design
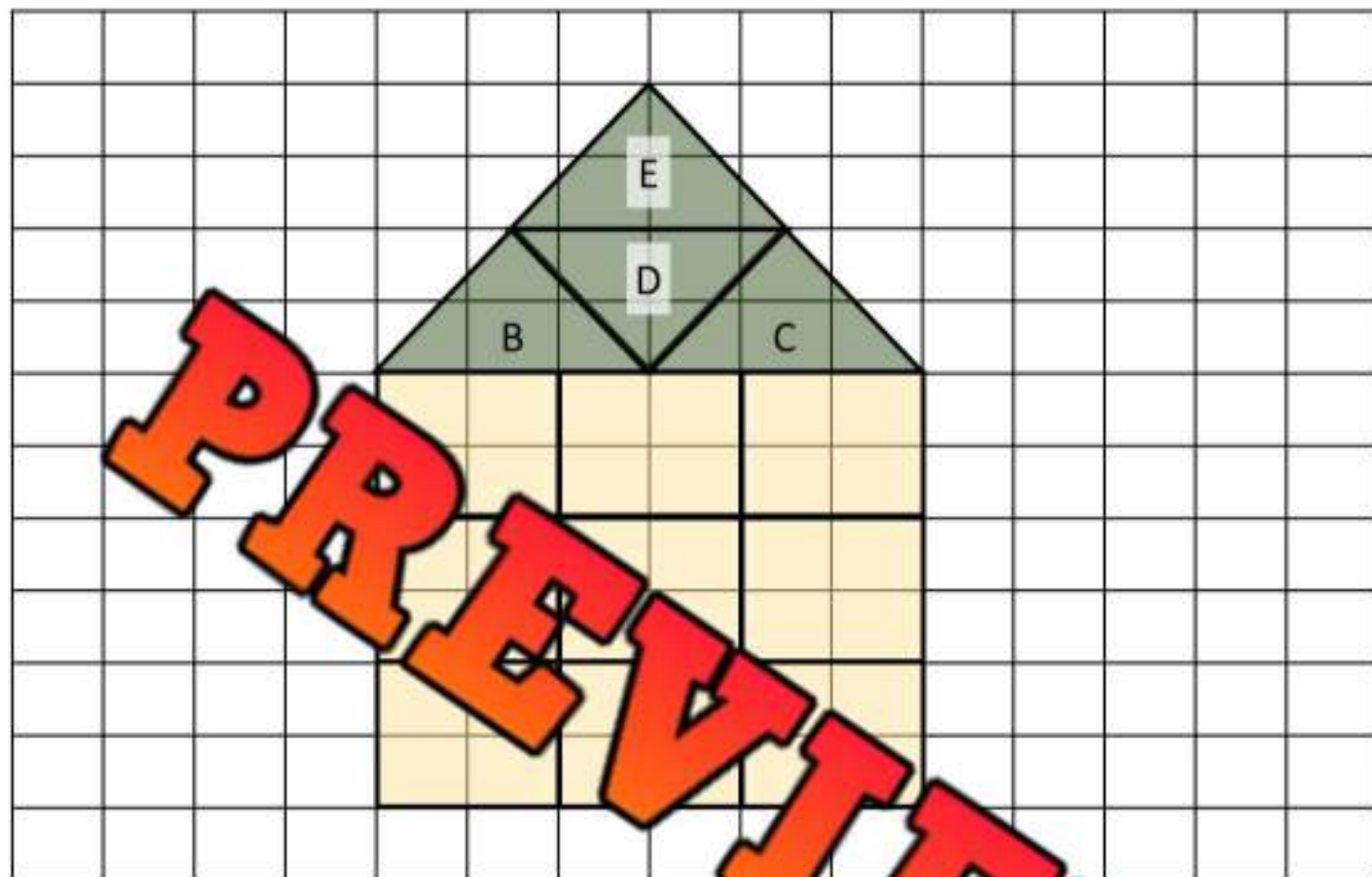
| Questions | Answer the questions below |

1) Which shape is A?

2) Which transformation was used with shape A?

3) Which shape is B, C, D, and E?

3) Which transformation was used to move shape B to C?

4) Which two transformations were used to move shape C to D?

1) _____

2) _____

5) Which transformation was used to move shape D to E?

Using a Coordinate System

Questions | Label the objects on the grid by using the numbers on the x and y axis

Symbol	Coordinates (x, y)	Symbol	Coordinates (x, y)
🐍	(9, 9)	🐘	(_____, _____)
🦅	(_____, _____)	🐵	(_____, _____)
🐼	(_____, _____)	🦒	(_____, _____)
🦁	(_____, _____)	🐱	(_____, _____)
🐻	(_____, _____)	🦫	(_____, _____)

Using A Coordinate Grid - Challenge

Questions | Write the letters on the grid according to the [grid]

Letter	Coordinates (x, y)	Letter	Coordinates (x, y)
A	(25, 55)	F	(85, 25)
B	(65, 45)	G	(75, 75)
C	(65, 80)	H	(95, 15)
D	(25, 70)	I	(55, 95)
E	(30, 55)	J	(75, 5)

Drawing With Coordinates

Questions | Plot and connect the dots with the coordinates below

(8, 11),	(9, 2),	(6, 3),	(5, 8),	(6, 13).
(9, 11),	(9, 4),	(5, 4),	(5, 11),	
(9, 8),	(8, 3),	(5, 2),	(6, 13),	
(11, 5),	(8, 2),	(3, 2),	(7, 14),	
(1, 2),	(6, 2),	(3, 5),	(8, 13),	

PREVIEW
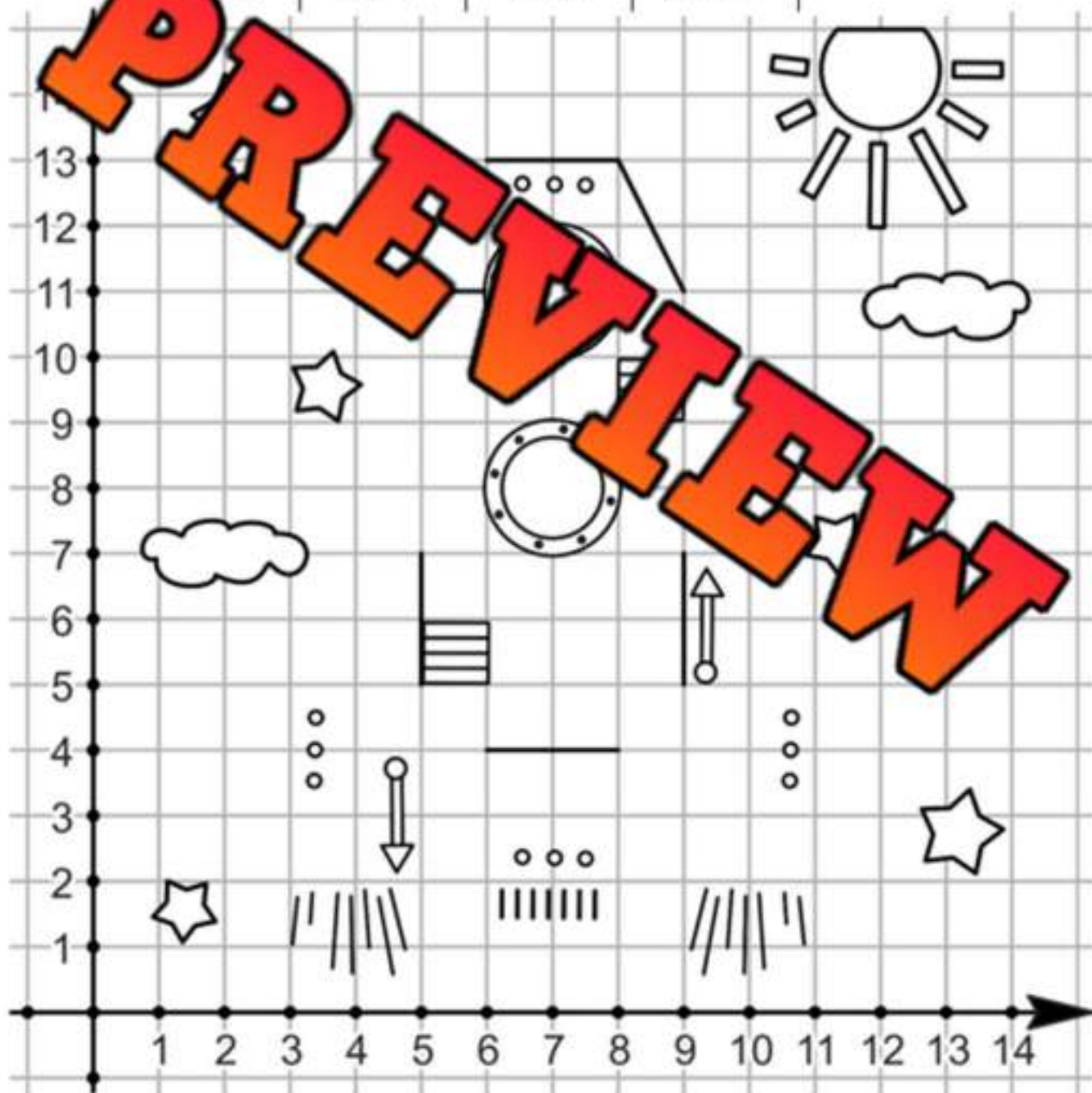
Drawing With Coordinates

Questions   Plot and connect the dots with the coordinates below

To reveal the mystery picture plot and connect the dots with coordinates:
(10, 13), (2, 11), (3, 8), (3, 10), (6, 8), (10, 13), (3, 10)
and (6, 5), (14, 7), (5, 6), (6, 5), (7, 2), (7, 4), (14, 7), (10, 2), (7, 4).

Plotting Polygons on a Coordinate Grid
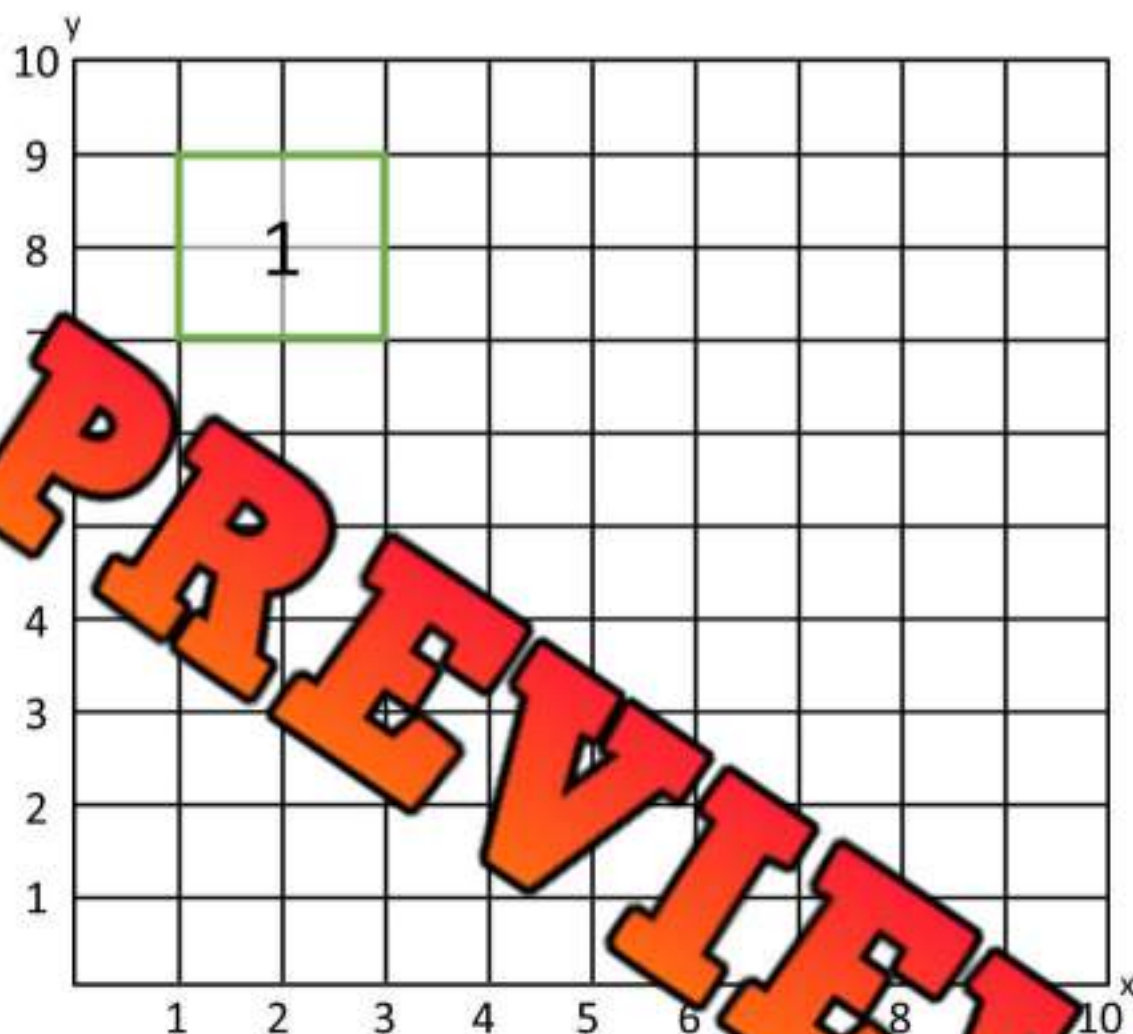
Questions | Place a point using the coordinates. Connect the points to form a polygon

Polygon	Coordinates (x, y)	Polygon	Coordinates (x, y)
1	(1, 7), (3, 7), (3, 9), (1, 9)	5	(8, 8), (10, 8), (9, 10)
2	(5, 4), (7, 4), (5, 6)	6	(9, 5), (10, 6), (9, 7), (8, 6)
3	(2, 1), (3, 1), (3, 3), (4, 3)	7	(4, 8), (7, 8), (6, 10), (5, 10)
4	(6, 0), (6, 2), (9, 0), (9, 2)	8	(8, 3), (8, 4), (9, 4), (9, 3)

Plotting Polygons on a Coordinate Grid
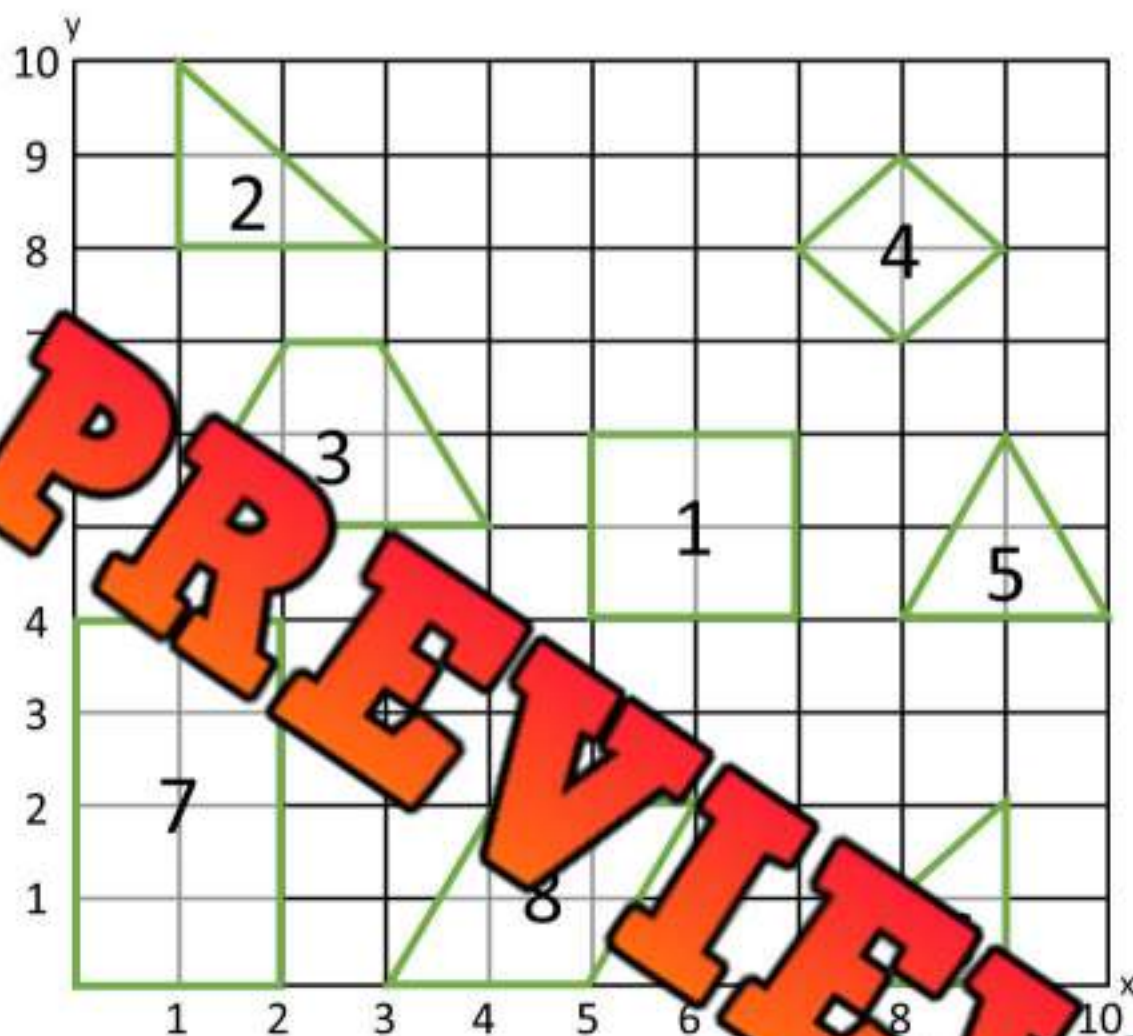
Questions — Write the coordinates for the vertices of each p...

Polygon	Coordinates (x, y)	Polygon	Coordinates (x, y)
1		5	
2		6	
3		7	
4		8	

Unit Quiz - Transformations

Part 1 | Describe or perform the translations below
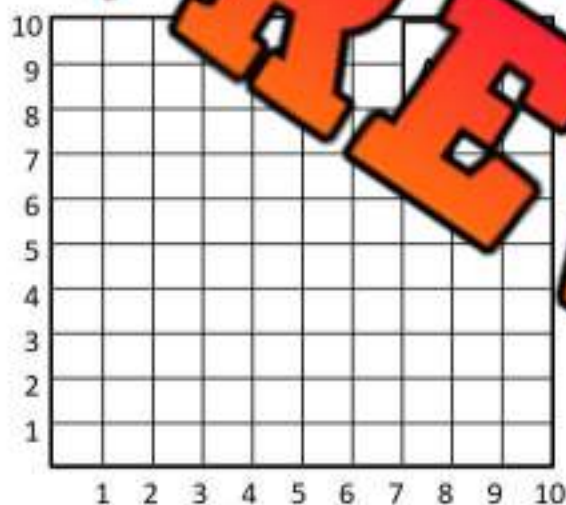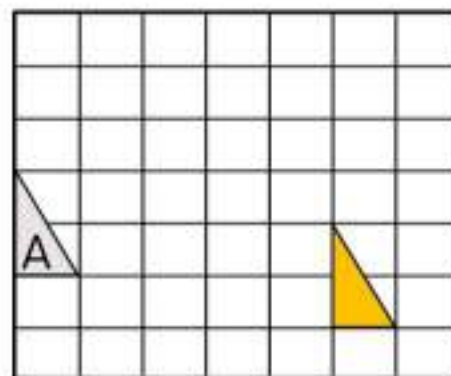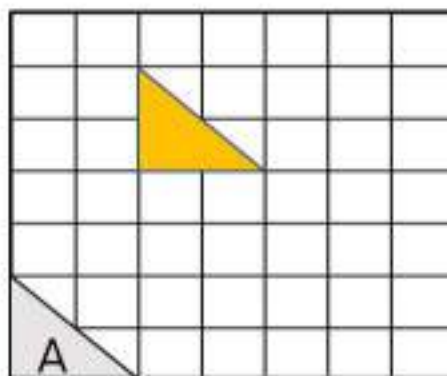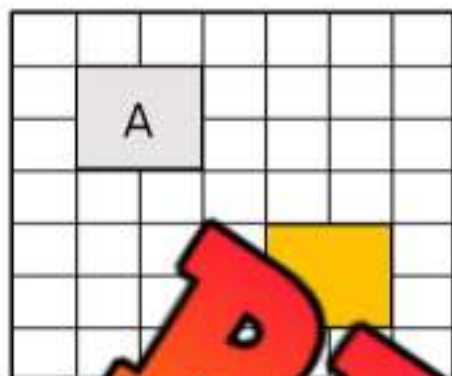
5) Left 4, down 5
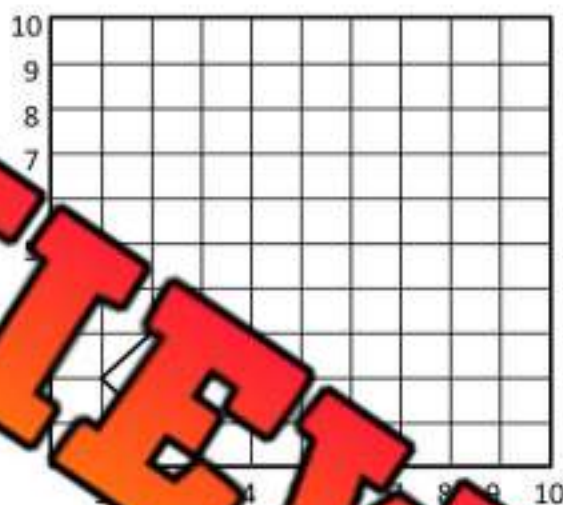
6) Rig...

Part 2 | Reflect the shapes across the mirror line

1)

2)
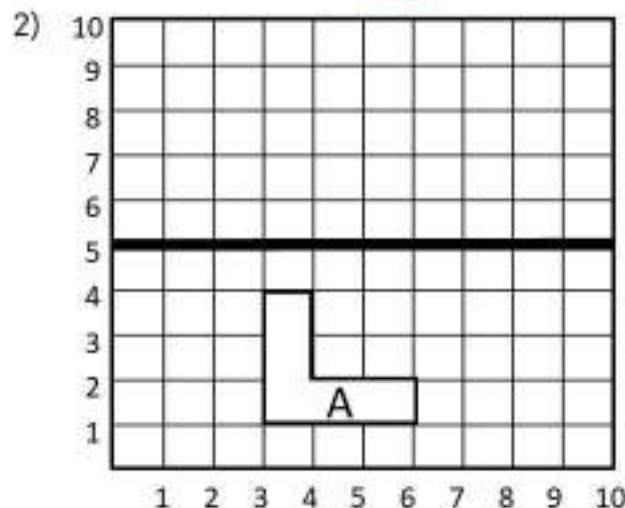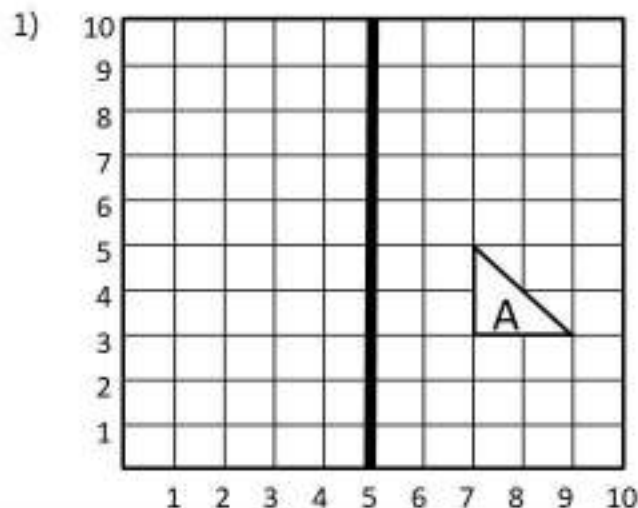
Part 3	Describe or perform the rotations
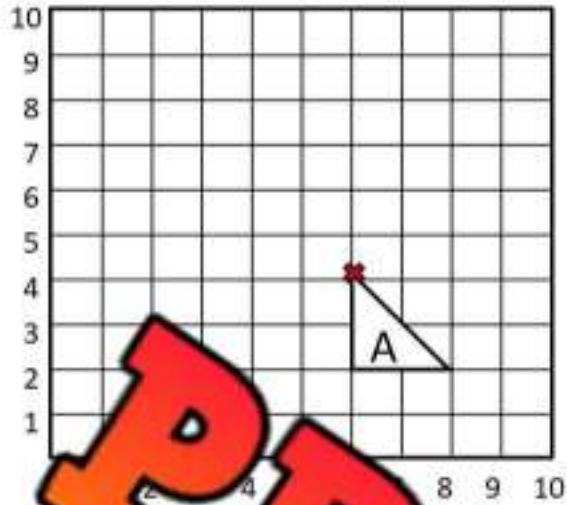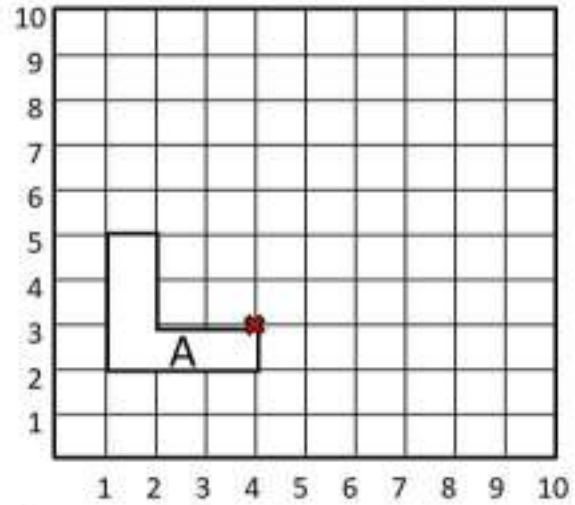
3) 90° Counterclockwise rotation	4) 180° rotation

Part 4	Use the grid to answer the questions below
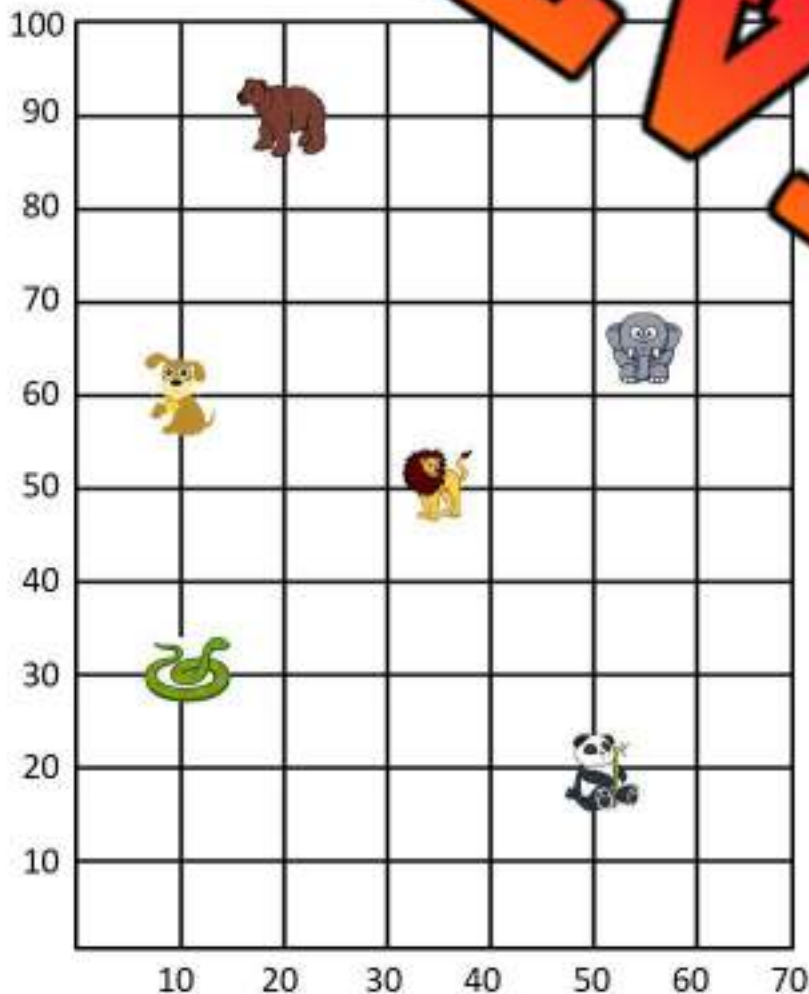
Symbol	Coordinates
🐍	(_____ , _____)
🐘	(_____ , _____)
	(_____ , _____)
🦁	(_____ , _____)
🐼	(_____ , _____)
🐻	(_____ , _____)

2. Write the letters on the grid

Letter	Coordinates
A	(30, 10)
B	(15, 45)
C	(65, 80)
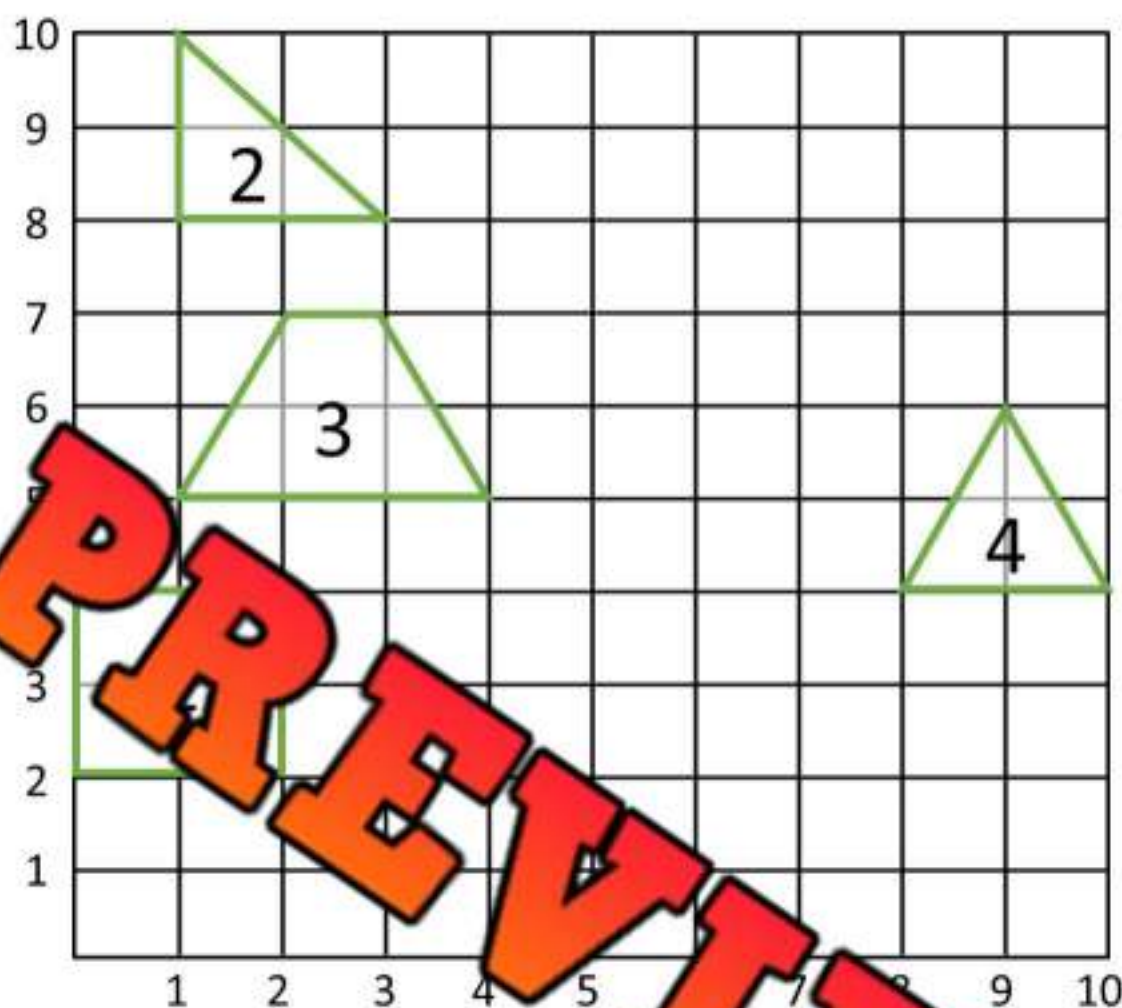
Part 5	Follow the instructions below

1) Write the coordinates for each Polygon

Polygon	Coordinates
1	
2	
3	
4	

2) Draw the polygon coordinates

Polygon	Coordinates
5	(7, 8), (8, 7), (9, 8), (8, 9)
6	(7, 0), (9, 0), (9, 2)
7	(4, 6), (4, 10), (6, 6), (6, 10)
8	(3, 0), (4, 2), (5, 0), (6, 2)

The Congruent House
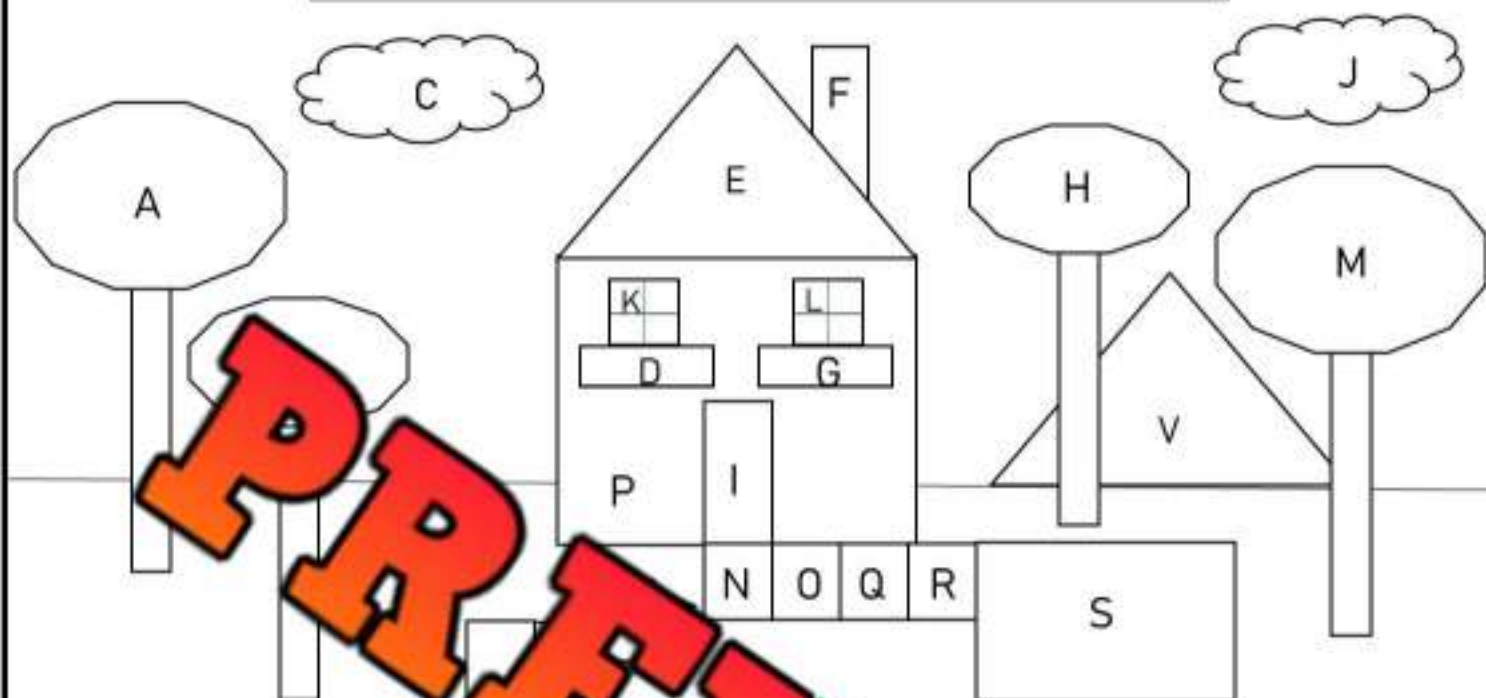
Questions	Answer the questions below by looking at the house above

1) Which shape is congruent to A?	
2) Which shape is congruent to shape C?	
3) Which shapes are congruent to shape N?	
4) Which shape is congruent to shape B?	
5) Which shape is congruent to shape E?	
6) Which shapes are congruent to shape D?	
7) Which shape is congruent to shape T?	
8) Which shape is congruent to shape L?	

Name: _____

Triangle Puzzle

Directions Fit the shapes from the next page inside the frame below

Triangle Puzzle

Directions Cut out the triangles and paste them on the previous page

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?
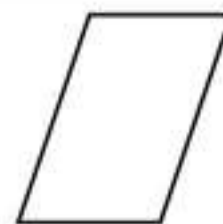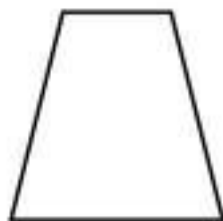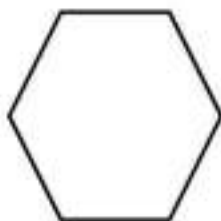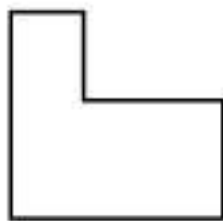
1) Yes No	2) Yes No	3) Yes No
4) Yes No	5) Yes No	6) Yes No
7) Yes No	8) Yes No	9) Yes No
10) Yes No	11) Yes No	12) Yes No
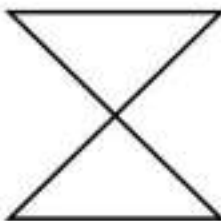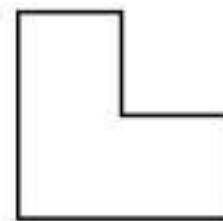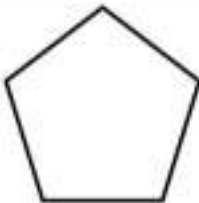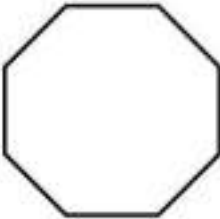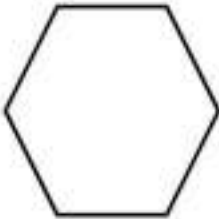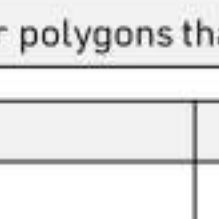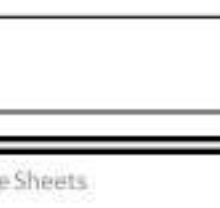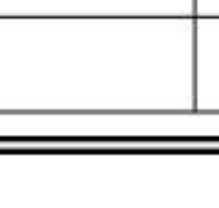
Regular Polygons That Tessellate

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	2) Yes No	3) Yes No
4) Yes No	5) Yes No	6) 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
1)	
2)	
3)	
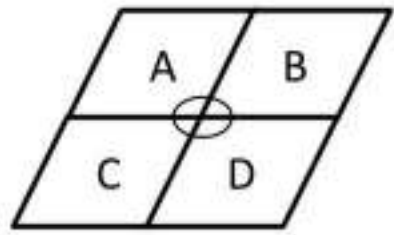
Tessellating with Quadrilaterals
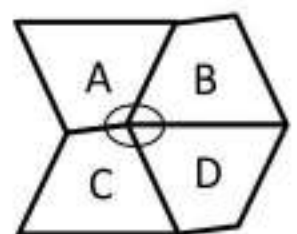
Every quadrilateral can be used to tessellate the plane. This is because a quadrilateral's interior angles always add up to 360°. A regular quadrilateral is easy to tessellate, whereas an irregular quadrilateral is sometimes more challenging to fit together.

Questions | Fill in the table below

Tessellation	Describe Transformation – Rotation, Reflection, Translation
	From Shape A to Shape D
	From Shape A to Shape B
	From Shape A to Shape C
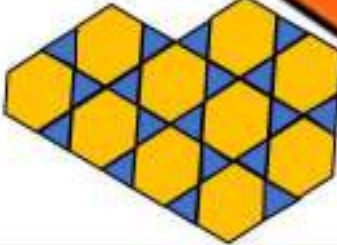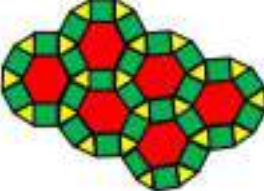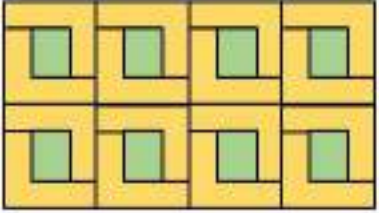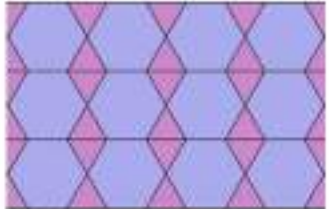
Tessellation	Describe Transformation – Rotation, Reflection, Translation
	From Shape A to Shape D
	From Shape A to Shape B
	From Shape A to Shape C

Tessellation	Describe Transformation – Rotation, Reflection, Translation
	From Shape A to Shape D
	From Shape A to Shape B
	From Shape A to Shape C

Type 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)	

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 a square made~~ with strong paper, like cardboard, cardstock or index cards.

2) Create a ~~design~~ ~~with a pencil~~ from one corner of the square to an adjacent corner. Do ~~not draw~~ diag~~onally and~~ do not stop halfway.

3) Cut along your pen~~cil lines~~ so that ~~you have~~ two pieces. The piece that you designed is called the ~~nibble~~.

4) Translate (slide) the nibble piece ~~to the~~ oppo~~site side~~ and tape the straight edges together. These two pieces need to fi~~t perfectly~~ with no overlapping.

| 1. | 2. | nibble |
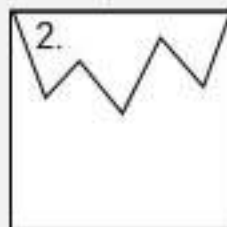
5) Place your tile on one of the four corners. To avoid having gaps, have the corner of the paper align with the original square you started with. The first tile you trace can hang off the edge of the paper.

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
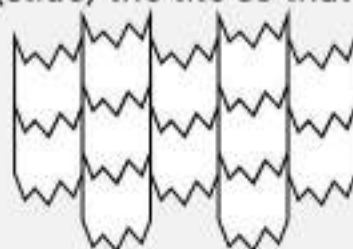
Creating Reflection Tessellation

Directions | Follow the instructions to create your own reflection 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 **reflection tessellation** is a tessellation that has been created by the reflecting (flipping) of a tile.

Instructions

1) Use a square made with strong paper, like cardboard, cardstock or index cards.

2) Create a design from one corner of the square to an adjacent corner. Do not go diagonal and do not stop halfway.

3) Repeat the step above until you have two designs to cut out

4) Cut both designs out. You should have two pieces.

5) **Reflect (flip)** the cut-out pieces and then slide them across to their opposite side. Tape the edges together making sure they line up without overlapping.
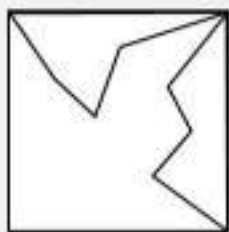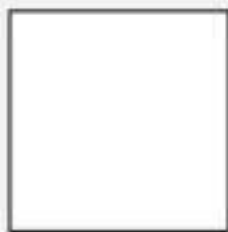
6) Place your tile on one of the four corners. To avoid having gaps, have the corner of the paper align with the original square you started with. The first tile you trace can hang off the edge of the paper.

7) Reflect (flip) the tile to fit it next to your original tile.

8) Continue reflecting the tile until the page is covered.

9) Colour your tessellation in a pattern

Creating 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) a tile.

Instructions:

1) U___ ___ ___ with strong paper, like cardboard, cardstock or index cards.

2) Crea__ a des___ ___ pencil from one corner of the square to an adjacent corner. T__ ___ a re___ ect, such as a bird or other animal. Do not draw diagonally a__ ___ot st___

3) Repeat the step ab___ __at you___ __wo designs to cut out

4) Cut both designs out. You___ uld ___ ___ces.

5) **Rotate** the cut-out pieces by tur___ __em t___ ___ __cent sides – do not flip them. Tape the edges together mak___ su___ __y line___ ___hout 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
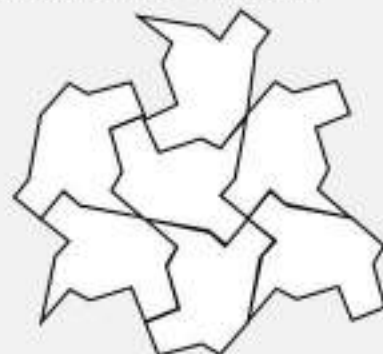
Yup'ik Patterns

The Yup'ik are an Inuit people from the Yukon and Alaska. Although they generally live and work in modern ways, their traditional clothing included parkas with patterns using regular polygons.

The use of regular polygons in repeated patterns is called a tessellation. The Yup'ik used regular polygons without overlapping them or h̶a̶v̶i̶n̶g̶ g̶a̶p̶s̶ between shapes.

The d̶e̶s̶i̶g̶n̶s̶ on the right showcase simpl̶e̶ t̶e̶s̶s̶e̶l̶l̶a̶t̶i̶o̶n̶s̶ that u̶t̶i̶l̶i̶z̶e̶ only 1 regular polygon p̶e̶r̶ p̶a̶t̶t̶e̶r̶n̶.

Pretend boxes on top of each other and connected
(*Qul'igelriit yassiliguaf*)

Pretend windows (*Egaleruaf*)

Pretend teeth or pretend mountains (*Kegguthguat or Ingriruaf*)

Pretend mountains with reflections (*Ingriruaf tarenrarluteng*)

Pretend braids (*Tagunuaf*)

Pretend river (*Kuiguaq*)

Directions Cre̶a̶t̶e̶ of ye̶ ̶ w̶ ̶ik patterns by repeating 1 regular polygon

Which <u>regular polygon</u> did you use to create your Yu̶ ̶ ̶ ̶ ̶ ̶tern? A̶ ̶ ̶ ̶re any other irregular polygons in your pattern?

_____

_____

Which <u>regular polygon</u> did you use to create your Yup'ik pattern? Are there any other irregular polygons in your pattern?

_____

_____

Unit Test - Geometry
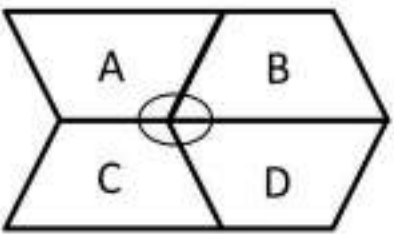
Part 1	Circle the congruent shapes. There may be more than one answer.

1)	a)	b)	c)
2)	a)	b)	c)
3)	a)	b)	c)
4)	a)	b)	c)
5)	a)	b)	

PREVIEW

Part 2	Fill in the table below

Tessellation	Describe Transformation – Rotation, Reflection, Translation
	From Shape A to Shape D
	From Shape A to Shape B
	From Shape A to Shape C

Part 3	Can the shapes below be used by themselves in a tessellation?
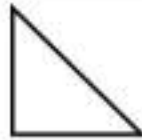
1) Yes No	2) Yes No	3) Yes No
4) Yes No	5) Yes No	6) Yes No

Part 4	What type of tessellation are the examples below
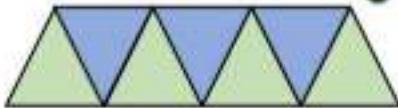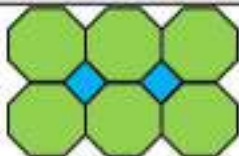
Tessellation	Type of Tessellation Regular, Semi-Regular, Irregular
1)	
2)	
3)	

Part 5	Draw a tessellation using the combination of polygons below

Pentagon and Triangle	
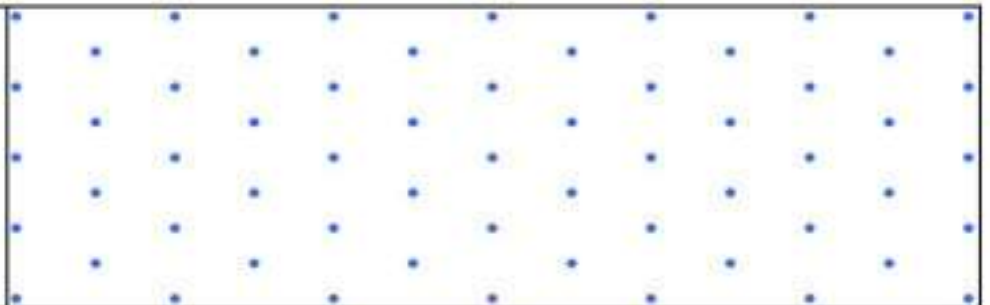
Grade 6

STATISTICS AND PROBABILITY

	Curriculum Expectations	Pages That Cover the Expectations
SP01	Students will be expected to create, label, and	5 – 16, 19 – 22, 24, 26 – 28, 29, 31 – 33, ... 58
SP		7, 9
SP04	Students will be expected to demonstrate an understanding of probability by • identifying all possible outcomes of a probability experiment • differentiating between experimental and theoretical probability • determining the theoretical probability of outcomes in a probability experiment • determining the experimental probability of outcomes in a probability experiment • comparing experimental results with the theoretical probability for an experiment	63 – 88

Preview of 60 pages from this product that contains 146 pages total.

Qualitative vs Quanitative Data

Quantitative data	**Qualitative data**
Data that uses numbers (measured, counted) – length, height, area, weight, time, etc.	data that uses words (categories) – choices, favourites, foods, colours, etc.

Questions | Read the description of the data and circle if it is <u>quantitative</u> or <u>qualitative</u>

1) Money ____ by the bake sale last month	Quantitative / Qualitative
2) Hei___ of the s___ grade 4	Quantitative / Qualitative
3) Favourite food___ e gra___ts	Quantitative / Qualitative
4) Rainfall in April last year	Quantitative / Qualitative
5) Favourite colours of the students in your cla___	Quantitative / Qualitative
6) The weight of different hockey skates	Quantitative / Qualitative
7) The height of the grade 4 students	Quantitative / Qualitative
8) Favourite season of the students in your school	Quantitative / Qualitative
9) Which town/city people live in that go to your school	Quantitative / Qualitative
10) Whether or not you have a pet	Quantitative / Qualitative
11) How long it took to get to school	Quantitative / Qualitative

Quantitative vs Qualitative Observations

Qualitative Observations
use your senses to observe the results

Quantitative Observations
use measurement tools to make observations

Part 1 Observe the picture below with your senses. Write as many qualitative observations as you can (imagine the smell/noise/taste/feel)

Smell: _____

Feel: _____

H_____

S_____

Taste: _____

Part 2 Pretend you can measure the weight, speed, and height of the animals below. Provide a quantitative observation (estimation of these measurements)

Height: _____cm

Weight: _____kg

Speed: _____km/h

Height: _____cm

Weight: _____kg

Speed: _____km/h

Height: _____cm

Weight: _____kg

Speed: _____km/h

Height: _____cm

Weight: _____kg

Speed: _____km/h

Quantitative vs Qualitative Observations

Image #1

Image #2

| Part 1 | Make observations about image #1 and put an x if it is <u>quantitative</u> or <u>qualitative</u> |

Observations	Quantitative	Qualitative
1) The vehicle has	x	
2) The vehicle		
3) The vehicle is white and b		
4) The vehicle's age is 3 y		
5) The vehicle has silver rims		
6) The vehicle has 2 headlights		
7) The vehicle is a car		
8) The vehicle drives up to 180km/hour		
9) The vehicle's tires are large		
10) The vehicle weighs 1700 kilograms		

| Part 2 | Write <u>quantitative</u> and <u>qualitative</u> observations about image # 2 |

Observations	Quantitative	Qualitative
1)		
2)		
3)		
4)		
5)		

Primary vs Secondary Data

Primary Data	**Secondary Data**
Data that you have collected yourself	Data that has been collected by someone else
Example	**Example**
- asking your classmates their favourite food	- finding data on the internet

Questions | Read the description of the data and circle if it is <u>primary</u> or <u>secondary</u> data

1) You rese____ how many points Lebron scored in the NBA playoffs last year	Primary Secondary
2) You ____ ____ of the kids in your class	Primary Secondary
3) You measure ____ in yo____ each day for a week	Primary Secondary
4) You look up how much s____ each d____ cember	Primary Secondary
5) You record how many minutes you stu____ day	Primary Secondary
6) You weigh different sized rocks in your yard	Primary Secondary
7) You measure the weight of your cat each year	Primary Secondary
8) You research how many Orcas are left off the coast of Vancouver	____ ndary

Part 2 | Write your own primary and secondary data descriptions below

1) Primary	
2) Secondary	
3) Primary	
4) Secondary	

Generating Questions - Primary Data

When we collect primary data, we often use survey questions to ask people to gather the data. We can also create research questions for experiments we plan to perform so that we can collect primary data.

Example of Primary Data Survey Questions
- What is your favourite hobby?
- What is your favourite food?

Example of Primary Data Research Questions
- How much snow will fall this month in my backyard?
- How many pushups can I do every day for 10 days?

| Part 1 | ... survey questions you could ask to gather primary data |

| 1) |
| 2) |
| 3) |
| 4) |
| 5) |

| Part 2 | Write 5 research questions for experiments you could do to gather primary data |

| 1) |
| 2) |
| 3) |
| 4) |
| 5) |

Generating Questions - Secondary Data

When we collect secondary data, we are finding data from another source. This means someone else has collected the data for others to use as secondary data.

Using secondary data allows us to answer questions we may have. With so much data available to us, we can write research questions about almost anything and find the data online.

Examples
1) Whi... ...uTubers had the most views last year?
2) Whi... ...layers scored the most points last year?
3) W... ...rage temperatures in Canada, the USA, Jamaica, and

Practice ...questi... ...you could look up to gather secondary data

1)	
2)	
3)	
4)	
5)	
6)	
7)	
8)	
9)	
10)	

Research - Finding Secondary Data

Choose a research question that you are most interested in. Find data that answers your research question. Organize your data by using the table below.

Organizer | Fill in the table below

1) What is your research question?

2) How will you organize your data? You will need 4 or 5 categories so you can use your data to make predictions.
For example: Sidney Crosby's goal totals for his first 5 seasons.

Categories				
Data				

3) What did you learn about your secondary data?

_____

_____

_____

_____

_____

4) Why is this data considered secondary data?

_____

_____

_____

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 <u>counting</u> or <u>measuring</u>.

   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. <u>Discrete data is counted.</u>

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

Question ___ the research question <u>discrete</u> or <u>continuous</u>?

Tip: Ask y___self if ___ ___ ___lit the answer in half.

Research ___	Discrete/Continuous
1. How many cm of sno___ ___ here ___ ___mber?	
2. How many siblings do you have?	
3. What was the average temperature in July?	
4. How many minutes did you read this week?	
5. How many video games do you own?	
6. How many kilometres did you run this week?	
7. How many sports do you play?	
8. What grade are you in?	
9. How many litres of milk do you drink a week?	
10. How many cars does your family have?	

Discrete or Continuous Data?

| Questions | Researching a car |

You are purchasing a new car over the phone. You ask the car salesman the questions below. Is the data he gives you **discrete** or **continuous**?

Data Collected	Discrete/Continuous
1) How _____ ____ the car have?	
2) How old is t___	
3) How many litres ___ __ ___ ___ ___	
4) How many wheels does the ___ hav_	
5) How fast does the car go?	
6) How many passengers can the car hold?	
7) How many speakers are in the car?	
8) How many kilometres has the car driven already?	
9) How much does the car cost?	
10) How long does it take to get up to 60km/hour?	
11) How long is the car?	
12) How many decibels do the speakers produce?	

Data - Qualitative, Discrete, or Continuous?

Part 1	Researching a basketball team

You are the manager of a basketball team and are researching your next opponent. You decide to collect data based on the questions below. Is the data qualitative, discrete, or continuous?

Data Collected	Qualitative/Discrete/ Continuous
1) How many players are on the team?	
2) How tall are the players?	
3) How many points a game do they score?	
4) What colour are their jerseys?	
5) Which teams have they played before?	
6) How many games have they played?	
7) How old are their players?	
8) How many wins do they have this year?	
9) How many seconds do they take before they shoot?	
10) Which type of defense do they play – zone or man?	
11) How many three pointers do they take a game?	
12) What is the name of their mascot?	
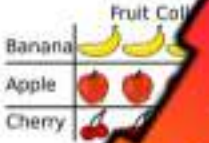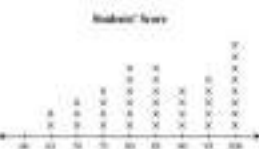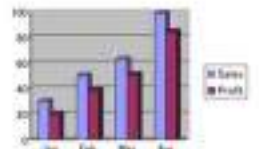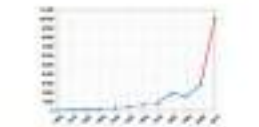
Part 2	Write one example of each type of data

Type of Data	Example
Qualitative	
Discrete	
Continuous	

Types of Graphs - Information

There are many different types of graphs. Each graph has features that make it better for certain data sets. Read about the different graphs below and when we use each one.

Types of Graph	Explanation	When We Use Them
Pictograph	– A graph that uses images or symbols to represent data	– When we want to display simple data in picture form. – When we want to make our data more interesting
Bar Graph	– ...rt the ...ng rectang... or col...	– When we want to compare categories between different groups – Used with discrete data
Line Plot	– A graph that displays data as points or symbols (checkmar... x's) above a number line – The dots are not connected	– Use... ...w the frequency of data... ... way to organize ...t small... ...es
Multiple-Bar Graph	– A graph that shows the relationship between different values of data – The bars are presented beside each other for clear comparisons	– To display the rel...onship between two sets of data. For example – gender differences or adults vs youth
Broken-Line Graph	– A graph that displays data as points that are connected with a line	– Used to track changes over periods of time – Used with continuous data

Types of Graphs - Questions

Part 1   Circle the graph you would use to represent the data

	Description	Graph A	Graph B
1)	You want a simple graph that shows a visual representation of the data	Broken-Line	Pictograph
2)	You want to show the relationship between two differe... ...es of data	Bar Graph	Multiple Bar Graph
3)	You ... ...raph that has smaller v...	Line Plot	Bar Graph
4)	You want a ... ...ph t... displays your data visually	Multiple Bar Graph	Bar Graph
5)	You want to graph... ...e... data...	Broken Line Graph	Line Plot
6)	You are displaying two se... ...data... ...and women	Bar Graph	Multiple Bar Graph

Part 2   Label the names of the graphs...

1)	2)	3)
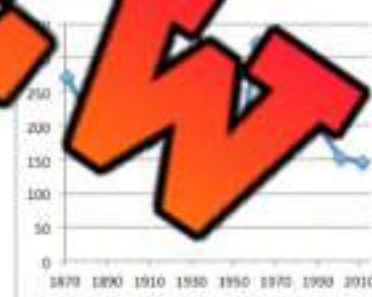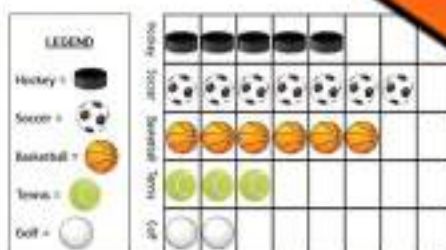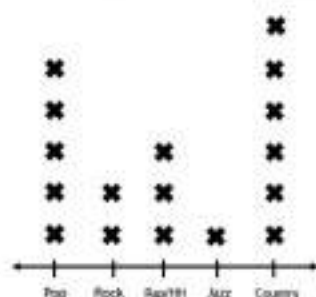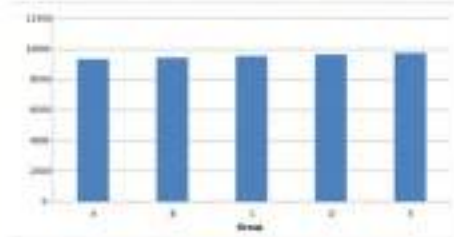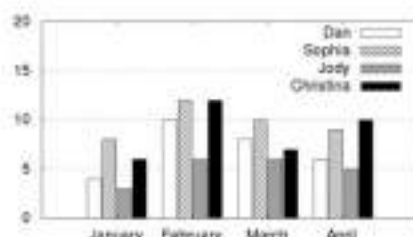
4)	5)	6)

Examining Scale – Favourite Vehicle

The two graphs below display the same data. Examine both graphs and answer the questions below.

Favourite Vehicle – Graph A

Favourite **Vehicle** – Graph B
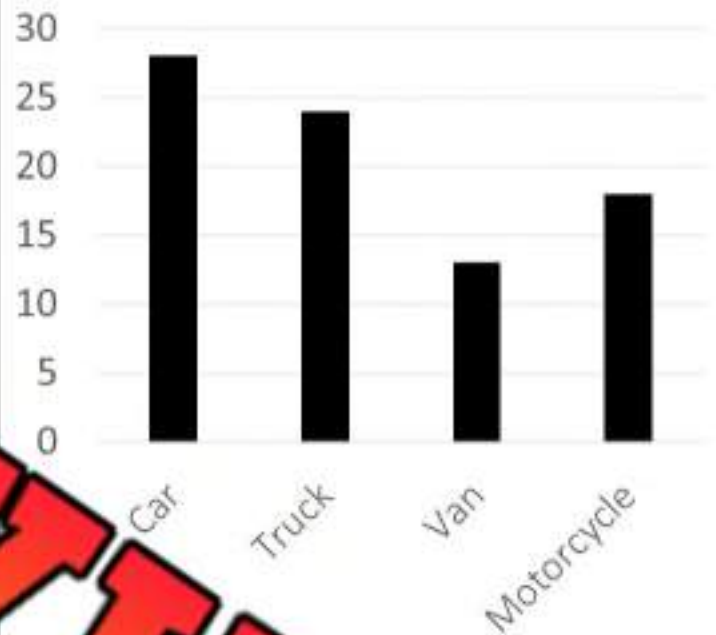
Questions | What do you notice about the two graphs?

a) What is the scale in Graph A?

b) What is the scale in Graph B?

c) Which graph uses more of the space?

d) Which graph is better? Why?

e) What other scales could you use for the data?
- Go up by _____
- Go up by _____

Creating Scale

When you create a scale for your graph, you need to look at the data so you can decide what to go up by. The goal is to create a graph that will fill the graph area.

Step 1: Look at the data. Find the lowest and highest numbers.
Step 2: Count how many lines you have to plot your data.
Step 3: Decide what to go up by to ensure you have enough space to plot ALL the data.

Favourite Dessert	# of votes
Brownie	21
Ice Cream	27
Cookie	15
Donut	12
Pudding	9

Brownie Ice Cream Cookie Donut Pudding

Favourite Transportation Method	# of votes
Bus	11
Car	49
Airplane	91
Train	70
Boat	82

Bus Car Airplane Train Boat
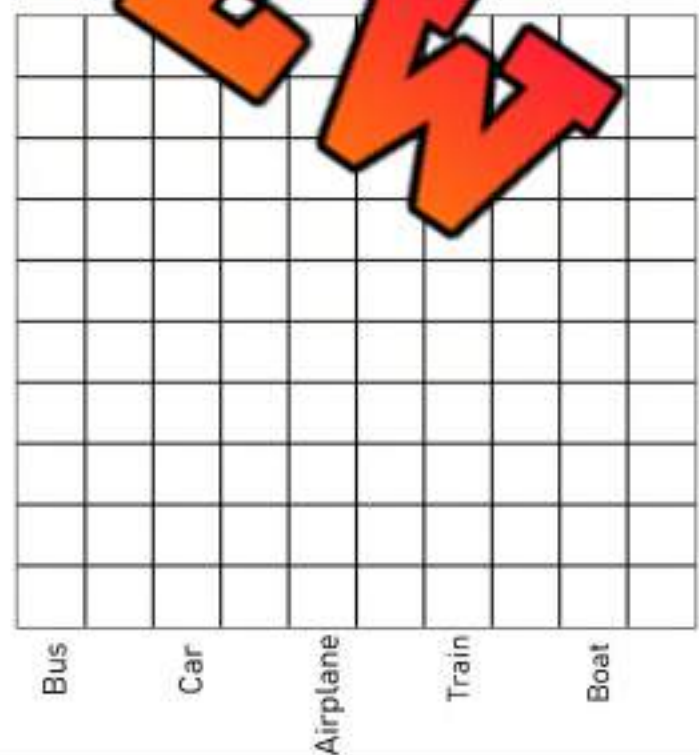
Collecting Data - Quantitative

Survey Question
Solving a Problem — Collect data by asking your classmates your survey question

Solve a problem in your life by asking your classmates for their opinion. For a quantitative question, the answers should be a number, or a number range. <u>For example:</u> "How many books should I read a week?" – <u>Answer options:</u> 0-3, 4-7, 7-10, 11+

Examples
1 – "How ma_ _ours a week should I practice my favourite sport"
2 – "How ma_ _rs of sleep should I get a night?"
3 – "How m_ _ _ and vegetables should I eat a day?"

Su__ _uestio_				
Example: How _____ *pencils do I ne__ _____* *school?*				
Categories				
Tally				
Frequency				

Interpreting Your Survey Results

1. How many people did you survey? _____

2. Which category was the most popular? _____

3. Which category was the least popular? _____

4. Was your problem solved? Will you follow the data and listen to your classmates?

_____

_____

Graphing Quantitative Data

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

☐ X axis label   ☐ Y axis label   ☐ Title   ☐ Scale   ☐ Categories

X

Multiple-Bar Graph - Favourite Social Media

The students in grade 4, 5, and 6 were asked which social media app was their favourite. The results have been sorted by grade in the multiple-bar graph below.

Favourite Social Media Apps

| **Part 1** | Fill in the frequency table by reading the multiple-bar graph above |

Grades	Snapchat	YouTube	Tik Tok	Facebook	Instagram
4					
5					
6					

| **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?	
c) How many more grade 4's liked YouTube than grade 6's?	

Multiple-Bar Graph - Favourite Beverage

A restaurant wants to know which drinks to keep in stock. They decide to sample three different age groups – kids under 12, teenagers, and adults 20 years or older. They randomly select individuals from each group.

Favourite Drinks

☐ Kids Under 12   ☐ Teen...   ■ Ad...

| Part 1 | Fill in the frequency table by reading the multiple-bar graph above |

Age Group	Coffee	Juice	Pop	...	...e Milk
12 and Under					
Teenager					
Adults (20+)					

| Part 2 | Answer the questions below |

a) How many people in each age group were surveyed?	
b) Which drinks would you keep in stock?	
c) Which age groups prefers juice and milk?	

Creating a Multiple-Bar Graph - 3 Groups

Assignment

Create a multiple-bar graph using data you have coll...

1. Choose a population that you can segment into 3 groups.
Example – Kids with no siblings, kids with 1 sibling, kids with more t...

Groups within Population: _____

2. Choose a survey question you would like to learn more abou... ...w the answers might be different based on your different groups.

Survey Question: _____

	Option 1	Option 2					Option 4				Option 5		
Group 1													
Group 2													
Group 3													
Tally	Tally	Tally											

Creating a Multiple-Bar Graph - 3 Groups

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

☐ X axis label ☐ Y axis label ☐ Title ☐ Scale ☐ Categories

_____

Legend
☐
☐

_____

Fill in the frequency table below with your 5 categories and 3 different groups

Interpreting a Broken-Line Graph

Precipitation is the amount of water falling from the sky. It can be in the form of rain, snow, drizzle, sleet, or hail. The data for total precipitation in Truro for 2021 has been represented in the broken-line graph below. <u>Numbers have been rounded to the nearest 5.</u>

Precipitation by Month in Truro
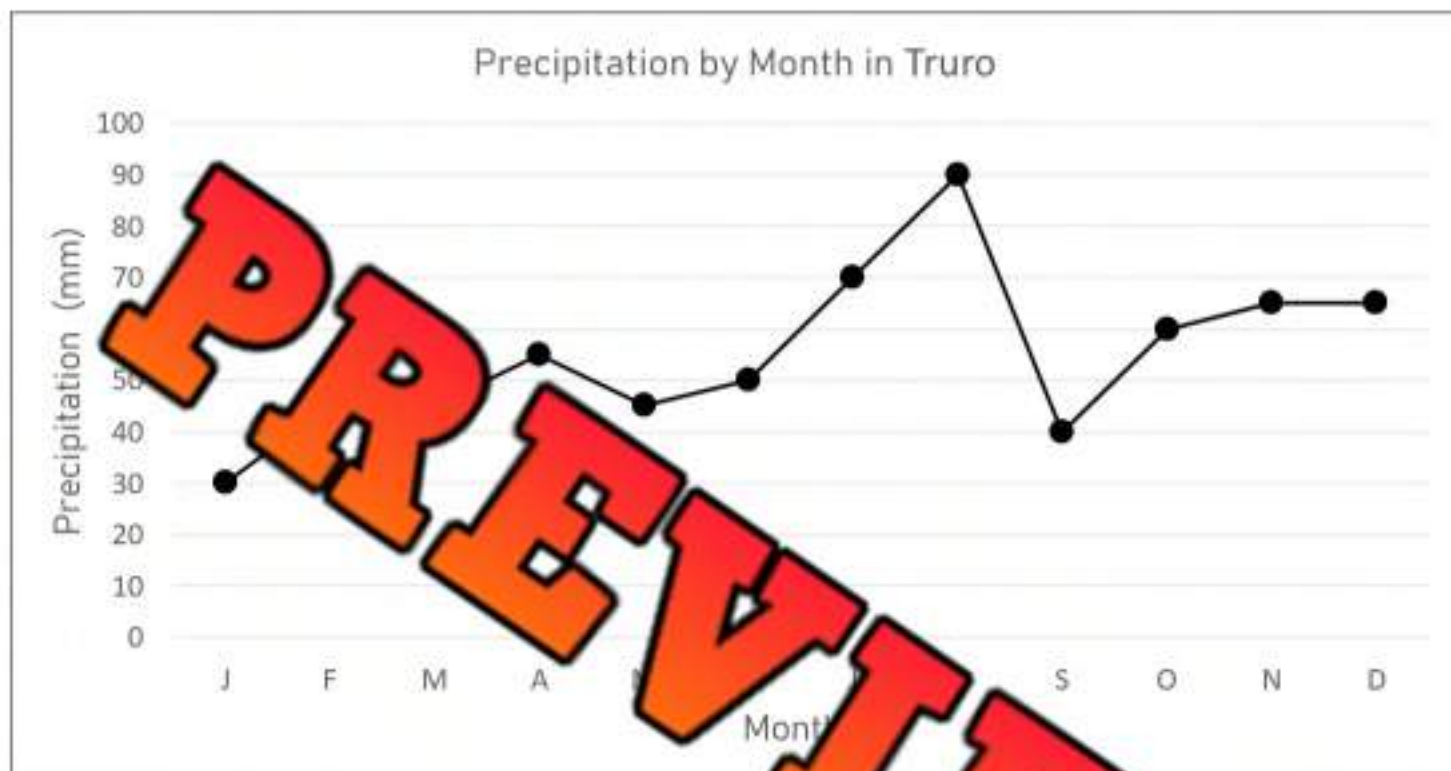
| Part 1 | Fill in the frequency table by reading the broken-line graph |

J	F	M	A	M	J	J	A	S	O	N	D

| Part 2 | Solve an argument |

a) Nolan and Rachel are arguing over which time of year has more precipitation. Nolan says that more precipitation falls from January–June, but Rachel says more falls from July–December. Who is correct? Explain using data to support your answer.

b) Rachel says the largest increase of precipitation happened from January to February, but Nolan thinks it was from September to October. Who is correct? Explain.

Interpreting a Broken-Line Graph

Jessica went for a bike ride from 8:00am to 2:00pm. She stopped to enjoy some food at a park and then went home. Unfortunately, she had a flat tire on the way home, but she eventually made it.

Bike Ride

Distance From Home (km)

70
60
50
40
30
20
10
0

8:00am   9:00am   ...am   ...   12:00pm   1:00pm   2:00pm
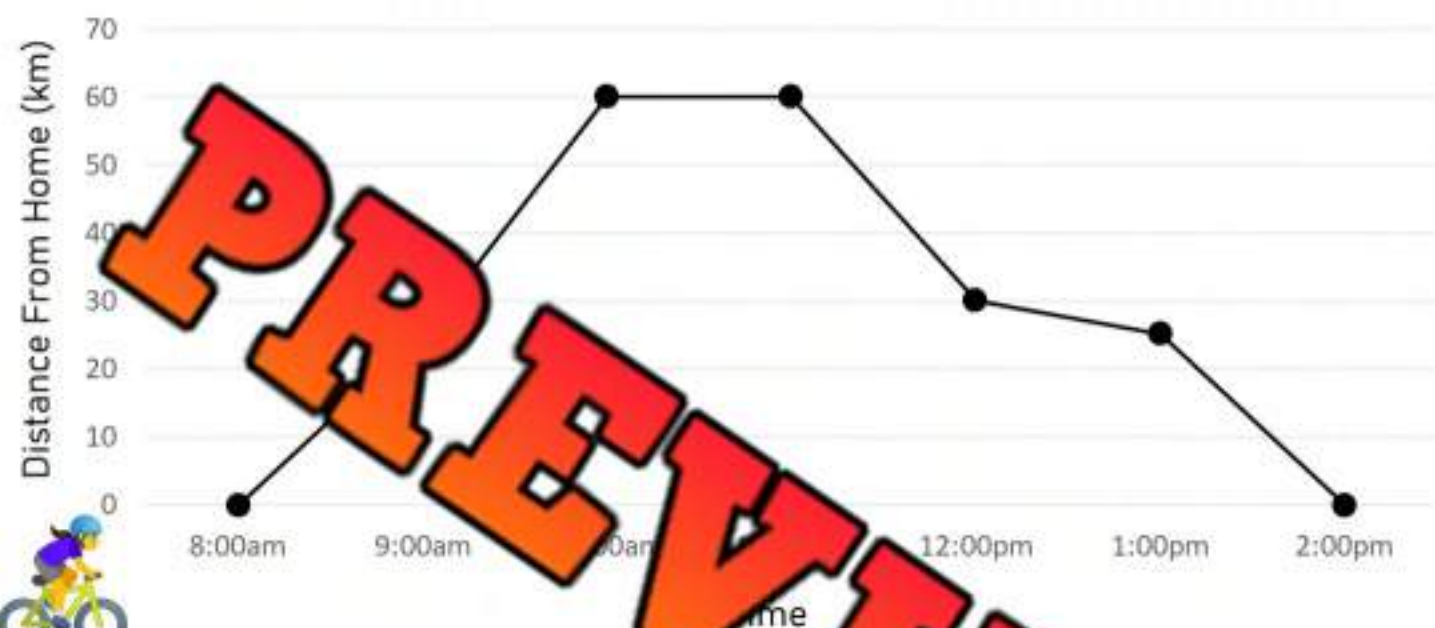
Time

| Part 1 | Fill in the frequency table by reading the broken-line graph above |

Time							
Distance Travelled (km)							

| Part 2 | Answer the questions below |

a) How many kilometres in total did Jessica travel?	
b) What time did Jessica stop at the park?	
c) When did Jessica have a flat tire?	
d) What hour did Jessica travel the most kilometres?	
e) How many hours was Jessica biking for?	

Constructing a Line Graph

Amy is saving her allowance. She gets paid $20 a week. Sometimes, she spends money on things she wants. The amount of money she has saved is shown in the table below.

Week	1	2	3	4	5	6	7	8	9	10
Savings	20	40	50	70	90	60	80	100	120	70

PREVIEW

Questions   Answer the questions below

1) Include in your graph: title, label x and y axis, and scale	
2) What week did Amy spend the most money?	
3) What weeks did Amy not spend any of her allowance?	
4) How much did Amy spend in total?	

Interpreting Double Broken-Line Graph

Lincoln and Maverick had a contest to see who could run the most kilometres in a week. Their results are displayed in the broken-line graph below.

Distance Ran in a Week — Lincoln — Maverick
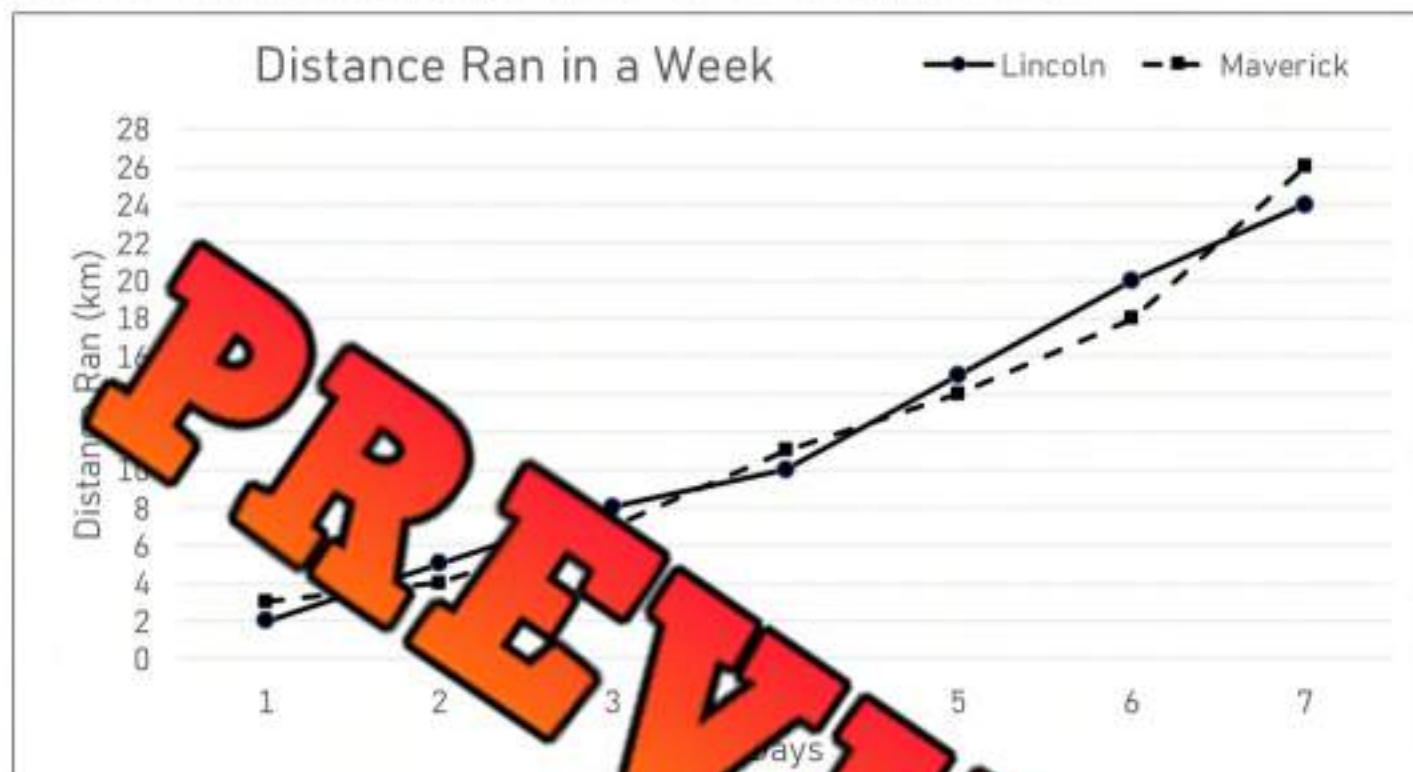
Questions	Answer the questions below

1) Who ran more km in the week?	
2) Is the data <u>continuous</u> or <u>discrete</u>?	
3) Which day did Maverick run the most? How far did he run?	
4) Who was winning the contest after the fifth day?	
5) How many total km did the two girls run together?	
6) Which day did Lincoln run the furthest? How far did he run?	
7) How many more km did Maverick run on day 7 than Lincoln?	

Interpolation and Extrapolation

When we talk about graphing, there are two important concepts called interpolation and extrapolation. Let's see what they mean in simple terms:

Interpolation: Imagine you have a connect-the-dots picture with some dots already connected, but there's a small gap in the middle. Interpolation is like filling in that gap using the information you have from the dots around it. It's like guessing where the line should go between the dots we already have.

Extrapolation: Now, think about the same connect-the-dots picture, but this time the line stops before reaching the last dot. Extrapolation is like guessing where the line should go, past the dots we have, to reach that last dot or even go further. Since we're extending the line beyond the information we have, it's more of an educated guess and might not be as accurate as interpolation.

... unt To A Park
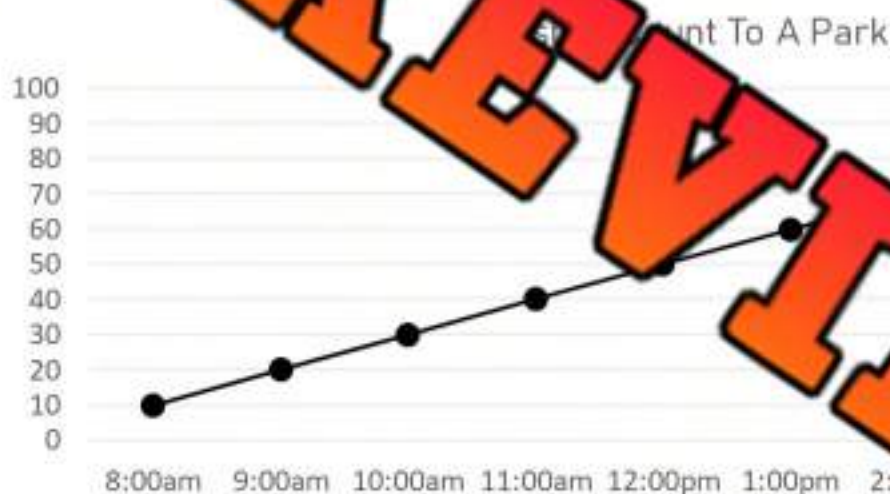
Questions	Answer the questions below

Interpolation	
1) How many visitors visited at 8:30?	
2) How many visitors visited at 11:30?	
3) How many visitors visited at 1:30?	

Extrapolation	
1) How many visitors would visit by 3:00 if the pattern continued?	
2) How many visitors would visit by 5:30 if the pattern continued?	

Interpolation and Extrapolation

Carbon Emissions (Million Metric Tons)
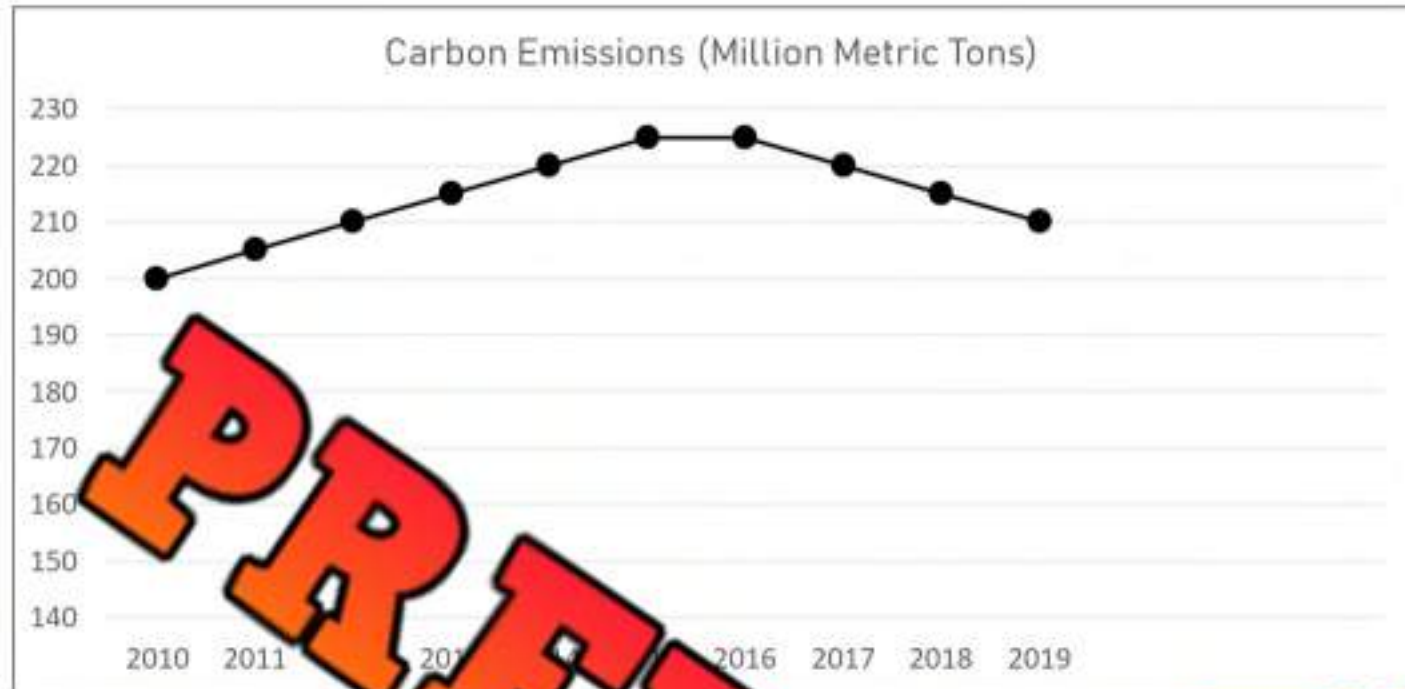
Questions	Answer the questions below

1) Do you need to use interpolation or extrapolation for the questions below?		
a) What were the carbon emissions by mid-year ____?	Interpolation	Extrapolation
b) What were the carbon emissions by mid-year 20__?	Interpolation	Extrapolation
c) What will the carbon emissions be by the year 2025?	Interpolation	Extrapolation

Interpolation	
1) How much carbon emissions were emitted by mid-year 2013?	
2) How much carbon emissions were emitted by mid-year 2018?	
3) How much carbon emissions were emitted by mid-year 2010?	

Extrapolation	
1) What do you predict will be the carbon emissions in the year 2022?	
2) What do you predict will be the carbon emissions in the year 2025?	
3) How much carbon emissions will be emitted by mid-year 2027?	

Interpolation and Extrapolation

Weekly Book Sales in CAD
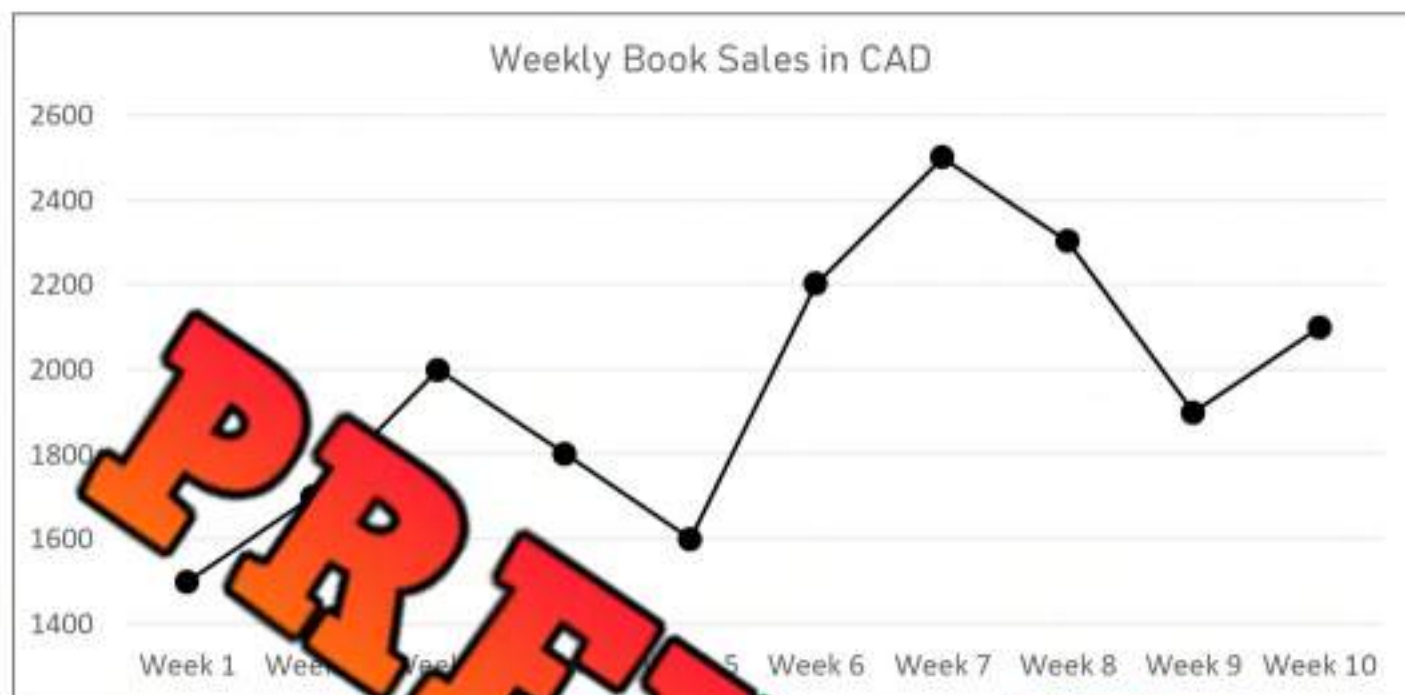
Questions	Answer the questions

1) How much did the bookstore earn in the middle of week 5?

2) How much do you think the bookstore will earn in week ?

3) How much did the bookstore earn in the middle of week ?

4) How much do you think the bookstore will earn in week 14?

5) How much did the bookstore earn in the middle of week 1?

6) Which is more accurate in describing data: interpolation or extrapolation? Explain.

_____

_____

_____

7) In this line graph, is the extrapolated data more of a guess or an exact figure? Explain.

_____

_____

Collecting Continuous Data - Experiment

Instructions: Create a "track" that you can run or walk around 10 times. Have a friend use a stopwatch to record how many seconds it takes for you to complete each lap.

Hypothesis	Will your lap times get faster or slower? Explain.

_____

_____

Data	Collect data and answer the questions below

Record how m___ __ t___ for you to complete each of the 10 laps.

1	2				6	7	8	9	10

Interpreting The Data

1. Was your data collected from a <u>primary</u> or <u>sec</u>____ sou_____

2. What conclusions can you draw from your data? Wha_____ ___earn?

a)_____

_____

b)_____

_____

3. Why is this data continuous data? _____

_____

4. If your graph has ten lines on the y axis (up and down), what scale will you go up by?

_____

_____

Creating a Broken-Line Graph

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

☐ X axis label ☐ Y axis label ☐ Title ☐ Scale ☐ Categories

PREVIEW

X

Collecting Quantitative Continuous Data

Quantitative continuous data is data that is collected through measuring. We don't use categories, instead we use numbers. Quite often, continuous data is collected over time – examples: minutes, days, weeks, months, or years.

Example – how many steps taken in each day for a week

Data Collection | Collect data by measuring or researching your question of interest

Question ___ ___est	_____
	_____

Use the ___ below ___ ___ze your data.

Interpreting The Data

1) Was your data collected from a <u>primary</u> or <u>secondary</u> source? _____

2) What conclusions can you draw from your data? What did you learn?

_____

_____

_____

3) What surprised you about the data you collected? Include at least 1 surprise.

_____

_____

Creating a Broken-Line Graph

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

☐ X axis label ☐ Y axis label ☐ Title ☐ Scale ☐ Categories

PREVIEW

X

Misleading Graphs

Imagine you are selling a book you wrote. You want to show your customers that your book is selling like crazy, and they should buy it now before it sells out. Which graph would you choose for an infographic?

Book Sales – Graph A

91
88
85
82
79
76
73
70

Sep   Oct   ~~Nov~~   ~~Dec~~

Book Sales – Graph B

100
80
60
40
20
0

Sep   Oct   Nov   Dec

Questions | What do you notice about the two graphs?

a) Which graph would you use to show customers that your sales have been growing massively? Why?

b) How are the graphs different? Do they have the same data?

c) How many sales were made from September to December?

d) Does graph A make it seem like more books were sold? Explain.

d) Why is it important to read a graph carefully?

Choosing an Appropriate Graph

Questions   Read the data below and decide which type of graph you would use to represent the data

1) You surveyed your classmates asking which sport is their favourite. The results are listed below.

Baseball	Gymnastics	Dance	Hockey	Football
21	35	22	18	12

Which type of graph would you use to represent the data? Explain your choice.

_____

_____

_____

2) You surveyed the teachers and students at your school asking them which food was their favourite. The results are listed below.

	Pizza	Pasta		Steak	Hot Dogs
Students	22	17		14	25
Teachers	16	21			2

Which type of graph would you use to represent the data? Explain your choice.

_____

_____

_____

3) You are displaying your height in centimetres from when you were 1 years old until you were 6 years old.

1	2	3	4	5	6
52	67	79	92	102	114

Which type of graph would you use to represent the data? Explain your choice.

_____

_____

_____

Unit Quiz - Data Literacy

Part 1   Read the description of the data and circle if it is quantitative or qualitative

1) Favourite music genre	Quantitative	Qualitative
2) Heights of students in your class	Quantitative	Qualitative
3) Number of students in each classroom	Quantitative	Qualitative

Part 2   the description of the data and circle if it is discrete or continuous

1) Temperature ~~over~~ month long time period	Discrete	Continuous
2) How many siblings ~~each student~~ class	Discrete	Continuous
3) How tall a tree grows over ~~a year~~ period	Discrete	Continuous

Part 3   Draw the bars for each of the bar graph below

Favourite Food	# of votes
Pizza	27
Chocolate	15
Spaghetti	12
Ice Cream	15
Chicken Wings	21

Pizza | Chocolate | Spaghetti | Ice Cream | Chicken Wings

	# of points
	70
Nathan	60
Courtney	30
Ashley	70
Luke	90

Jake | Nathan | Courtney | Ashley | Luke

Part 4	Read the graph and answer the questions below

Rebecca and Jessica had a contest to see who could read more pages in their novels in 7 days.
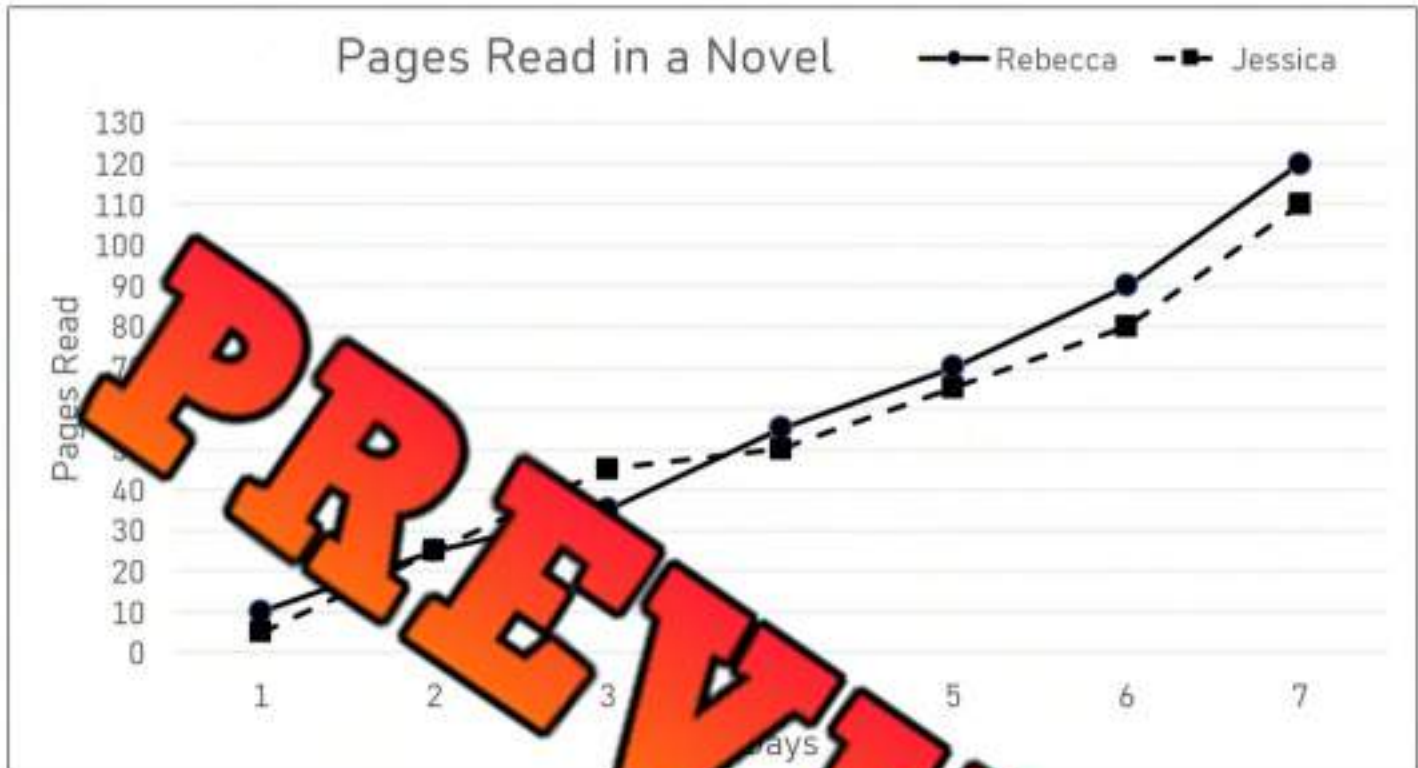
Questions	Answer the questions below

1) Who read more pages in the 7 days?	
2) Is the data continuous or discrete?	
3) Which day did the two girls read the most pages?	
4) Which day were they tied?	
5) How many total pages did the two girls read together?	
6) Which day was Jessica ahead?	
7) How many pages did Rebecca read from day 6 to 7?	

Part 5 — Graph the data below in a broken-line graph

The data for the amount of snowfall in New Glasgow is presented in the table below. Graph the data as a broken-line graph. Make sure to label your graph properly.

Month	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Snowfall (cm)	8	24	19	50	75	9	5

1) Which month had the most snowfall? _____

2) Which month had the least snowfall? _____

3) How much did it snow in total during these 7 months? _____

4) Is this data discrete or continuous? _____

5) What conclusions can you make from this data? List at least 2.

_____

_____

Probability - Quarters

| Part 1 | Shade in one quarter of the shapes. Write the fraction of shaded shapes to total shapes |

a)   b)   c)

d)   e)   f)

| Part 2 | Shade in quarters of the shapes. Write the fraction of shaded in shapes |

a)   b)   c)

| Part 3 | Fill in the tables below |

#	One Quarter	Fraction
1	20	5	$\frac{5}{20}$
2	80		
3	60		
4	24		
5	48		
6	68		
7	96		

#	Quarters	Fraction
1		$\frac{45}{60}$
2	40	
3	72	
4	16	
5	44	
6	84	
7	92	

Describing the Likelihood of Events

Questions | Circle the likelihood of the event happening

1) You will get heads when you flip a coin.

Equally Likely

More Likely

Less Likely

2) You will roll a 2 when you roll a dice.

Equally Likely

More Likely

Less Likely

3) Yo~~u will~~ a ~~sq~~are when you roll ~~a~~ dice.

Equa~~lly~~ ~~li~~kely

M~~ore~~ ~~like~~

~~Less li~~kely

4) It was rain in the next 30 minutes.

Equally Likely

More Likely

Less Likely

5) You will get an odd number when you roll a dice.

Equally Likely

More Likely

Less Likely

6) Yo~~u will~~ get a tails when you flip a c~~oin~~.

Equally Likely

More Likely

~~L~~ess Likely

7) You will pull a red card from a deck of cards.

Equally Likely

More Likely

Less Likely

8) You will get a ~~heart fro~~m a deck of cards.

~~E~~qually Likely

More Likely

Less Likely

9) You will win a game of rock, paper, scissors.

Equally Likely

More Likely

Less Likely

10) You will use rock in a game of rock, paper, scissors.

Equally Likely

More Likely

Less Likely

Describing the Likelihood of Events

We can describe the likelihood of events by using the following terms:
impossible, unlikely, equally likely, likely, certain

Impossible = Cannot happen
Less Likely = Will probably not happen
Equally likely = There is an equal chance it could happen and that it won't happen
More Likely = Will probably happen
Certain = Will definitely happen
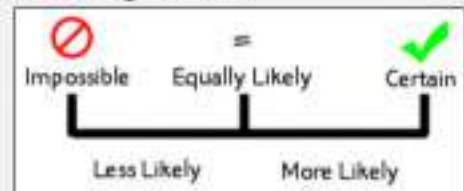
Question: Use the terms to describe the likelihood of the events below

Event	
1) You will have ice cream tonight	
2) You will drink water today	
3) You will play on an electronic device	
4) You will win the lottery today	
5) You will see an alien today	
6) You will ride in a vehicle today	
7) You will sleep tonight	
8) You will eat chips today	
9) You will go swimming today	
10) You will play a sport today	

Describing the Likelihood of Events

Questions	Circle the likelihood of the event happening

1) Ice will melt on a hot day.

Certain
More Likely
Equally Likely
Less Likely
Impossible

2) Water will freeze on a hot day.

Certain
More Likely
Equally Likely
Less Likely
Impossible

3) Someone _____ will _____ way tomorrow

Certain
More Likely
Equally Likely
Less Likely
Impossible

4) You will jump at least once today.

Certain
More Likely
Equally Likely
Less Likely
Impossible

6) A talking horse will teach your class today.

Certain
More Likely
Equally Likely
Less Likely
Impossible

6) _____ in class today.

Certain
More Likely
Equally Likely
Less Likely
Impossible

7) You will see a car today.

Certain
More Likely
Equally Likely
Less Likely
Impossible

8) Water will come out of the tap purple.

Certain
More Likely
Equally Likely
Less Likely
Impossible

Theoretical Probability - Darts

Theoretical probability is the likelihood an event <u>should</u> happen. It is based on the <u>number of favourable outcomes</u> divided by the <u>sample size (total possible outcomes)</u>. Imagine below, that the shaded in area is a target and the white part is the wall.

Questions | Represent the probability of hitting the target using a fraction, decimal and percent

1)

Fraction	Decimal	Percent
30/100	0.3	30%

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
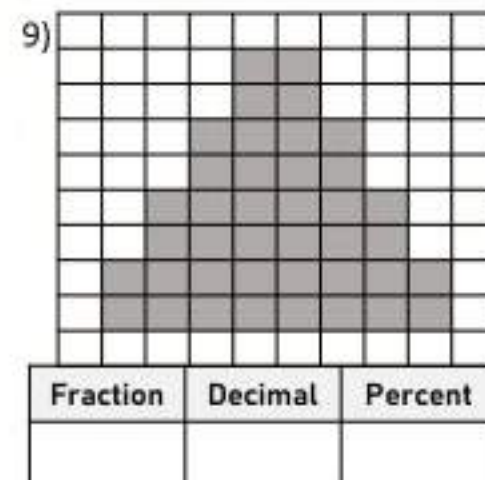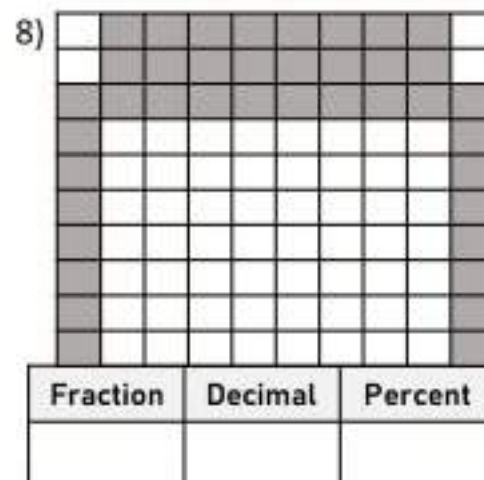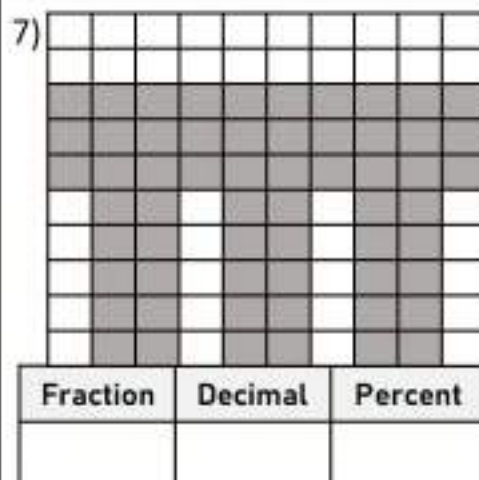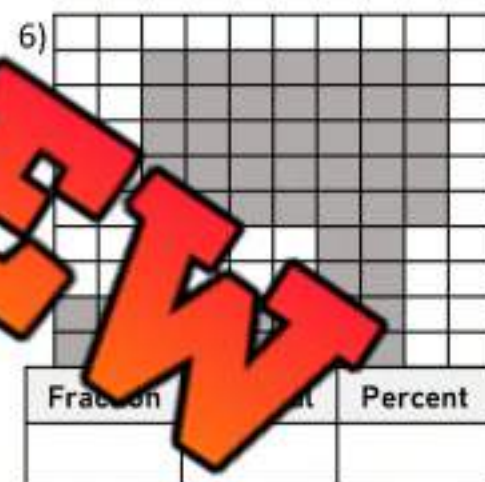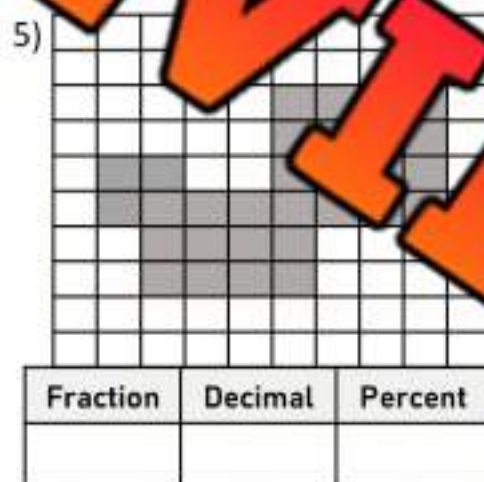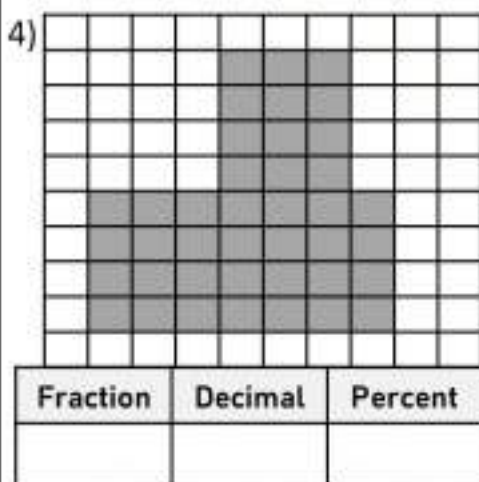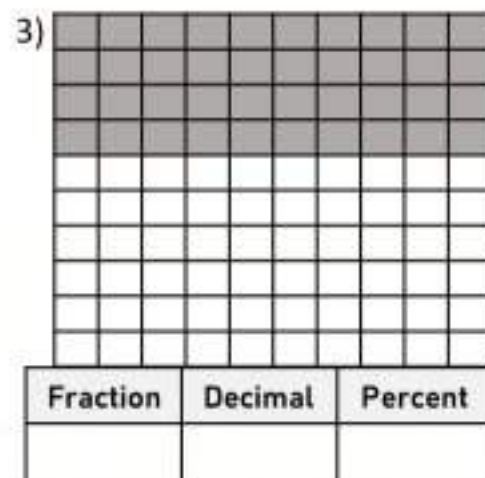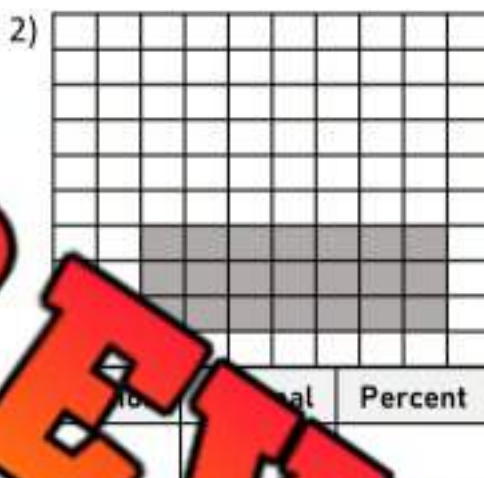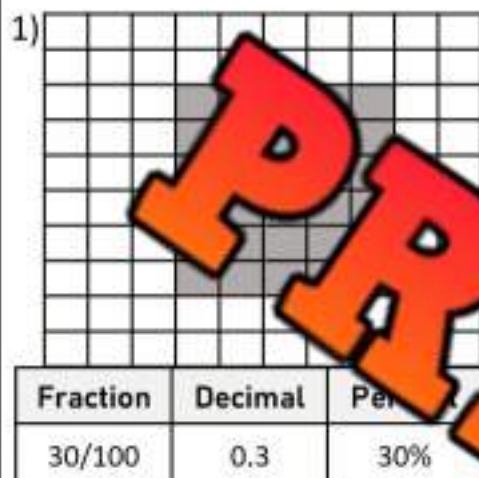
Theoretical Probability - Spinner

Questions	Read the spinner and represent the probability using a fraction

1)
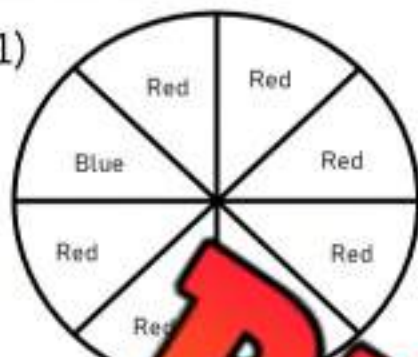
	Fraction	Decimal	Percent
a) Spinning a red	____		
b) Spinning a blue	____		
c) Spinning a blue or red	____		

2)
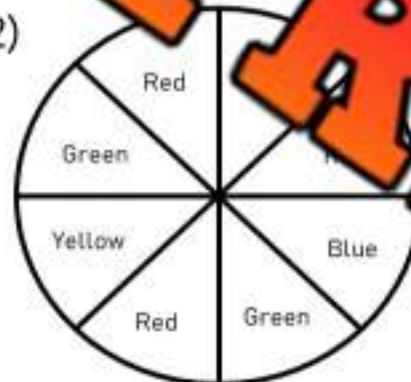
	Fraction	Decimal	Percent
a) blue	____		
ing	____		
c) Spinning llow or	____		

3)
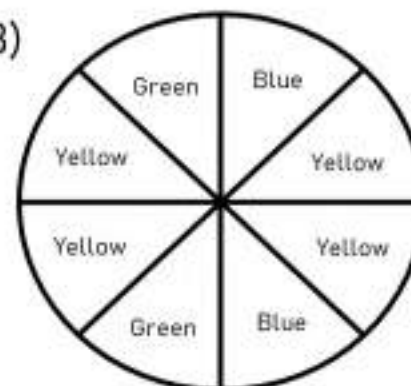
	Fraction	Decimal	Percent
a) Spinning a green or blue			
b) Spinning a yellow	____		
c) Spinning a yellow, green or blue	____		

4)
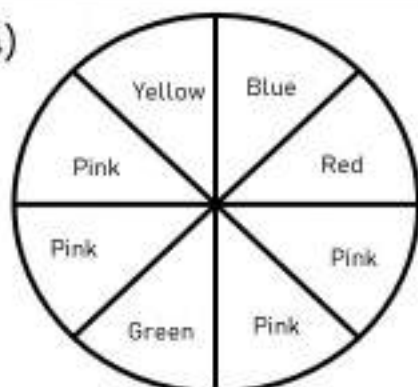
	Fraction	Decimal	Percent
a) Spinning a blue or green	____		
b) Spinning a blue or yellow	____		
c) Spinning a pink	____		

Theoretical Probability - 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 — Circle the fraction that represents the probability of the event

1. What is the likelihood of you rolling a 1?

Impossible — Very Unlikely — Unlikely — Even Chance — Likely — Very Likely — Certain

$\frac{0}{6}$ $\frac{1}{6}$ $\frac{2}{6}$ $\frac{3}{6}$ $\frac{4}{6}$ $\frac{5}{6}$ $\frac{6}{6}$

Decimal	Percent

2. What is the likelihood of you rolling a 5?

Impossible — Very Unlikely — Unlikely — Even Chance — Likely — Very Likely — Certain

$\frac{0}{6}$ $\frac{1}{6}$ $\frac{2}{6}$ $\frac{3}{6}$ $\frac{4}{6}$ $\frac{5}{6}$ $\frac{6}{6}$

Decimal	Percent

3. What is the likelihood of you rolling a 1, 2, or 3?

Impossible — Very Unlikely — Unlikely — Even Chance — Likely — Very Likely — Certain

$\frac{0}{6}$ $\frac{1}{6}$ $\frac{2}{6}$ $\frac{3}{6}$ $\frac{4}{6}$ $\frac{5}{6}$ $\frac{6}{6}$

Decimal	Percent

4. What is the likelihood of you rolling a 1, 2, 3, or 4?

Impossible — Very Unlikely — Unlikely — Even Chance — Likely — Very Likely — Certain

$\frac{0}{6}$ $\frac{1}{6}$ $\frac{2}{6}$ $\frac{3}{6}$ $\frac{4}{6}$ $\frac{5}{6}$ $\frac{6}{6}$

Decimal	Percent

5. What is the likelihood of you rolling an odd number?

Impossible — Very Unlikely — Unlikely — Even Chance — Likely — Very Likely — Certain

$\frac{0}{6}$ $\frac{1}{6}$ $\frac{2}{6}$ $\frac{3}{6}$ $\frac{4}{6}$ $\frac{5}{6}$ $\frac{6}{6}$

Decimal	Percent

Describing the Likelihood of Events

Spinner
The spinner has different coloured parts on it. When you spin the arrow, it will land on one of the colours.
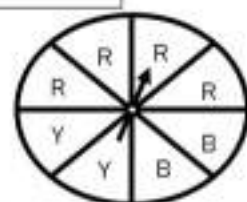
| Questions | Write the fraction for each of the situations below. Then circle the probability |

1. What is the likelihood of landing on a red part?
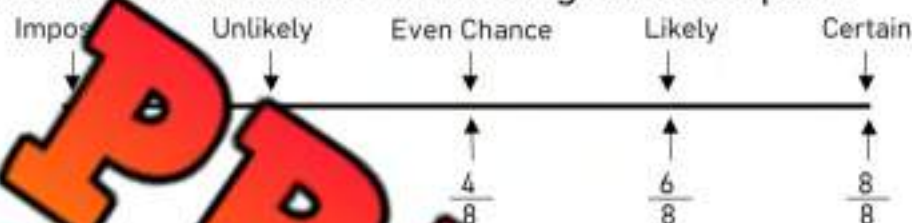
Impossible   Unlikely   Even Chance   Likely   Certain

$\frac{4}{8}$ $\frac{6}{8}$ $\frac{8}{8}$

Decimal	Percent

2. What is the likelihood of landing on a blue part?

Impossible   Unlikely   Even Chance   Likely   Certain

$\frac{0}{8}$ $\frac{2}{8}$ $\frac{8}{8}$

Decimal	Percent

3. What is the likelihood of landing on a red or yellow part?

Impossible   Unlikely   Even Chance   Likely   Certain

$\frac{0}{8}$ $\frac{2}{8}$ $\frac{4}{8}$ $\frac{6}{8}$ $\frac{8}{8}$
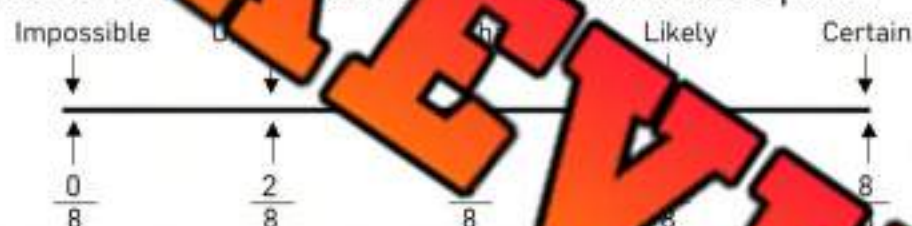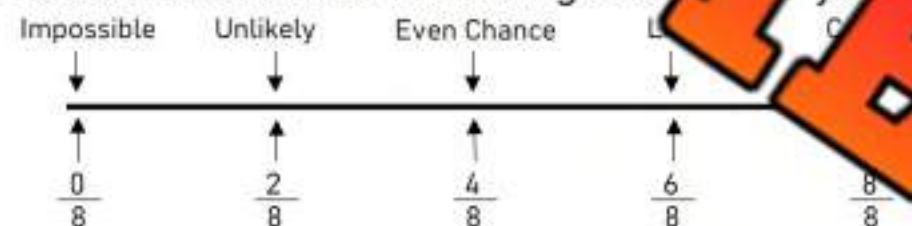
Decimal	Percent

4. What is the likelihood of landing on a red, blue, or yellow

Impossible   Unlikely   Even Chance   Likely   Certain

$\frac{0}{8}$ $\frac{2}{8}$ $\frac{4}{8}$ $\frac{6}{8}$ $\frac{8}{8}$
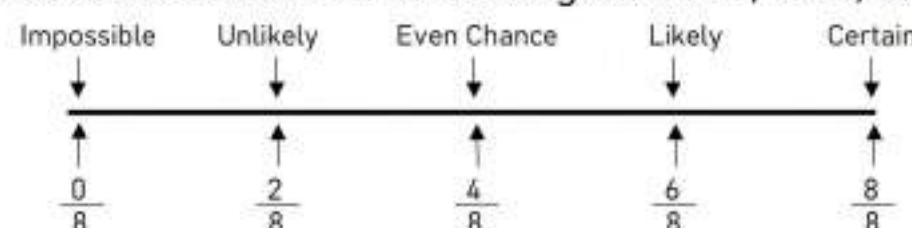
Decimal	Percent

5. What is the likelihood of landing on a purple part?

Impossible   Unlikely   Even Chance   Likely   Certain

$\frac{0}{8}$ $\frac{2}{8}$ $\frac{4}{8}$ $\frac{6}{8}$ $\frac{8}{8}$
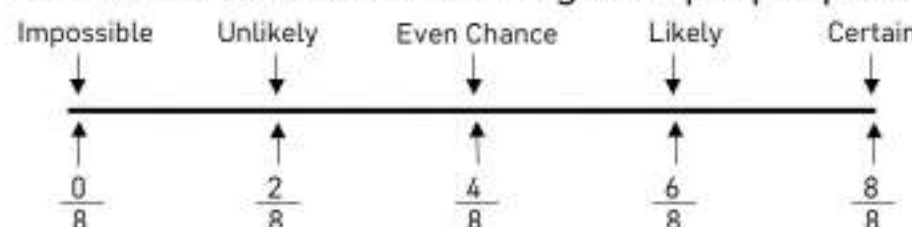
Decimal	Percent

Describing the Likelihood of Events

Cookie Jar

There were 24 cookies in a cookie jar. 12 of the cookies were chocolate chip (cc), 8 were oatmeal raisin (or), and 4 were double chocolate (dc).
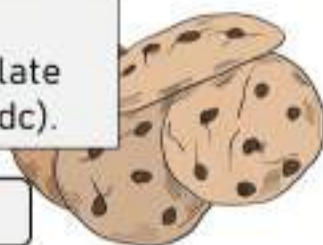
Questions	Circle the probability term and write the fraction

1. What is the likelihood of you picking out a double chocolate cookie?
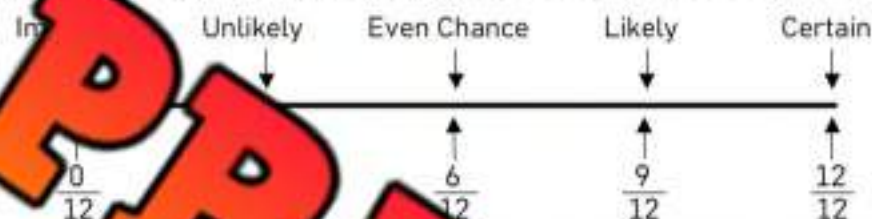
Impossible   Unlikely   Even Chance   Likely   Certain

$\frac{0}{12}$ $\frac{6}{12}$ $\frac{9}{12}$ $\frac{12}{12}$

Decimal	Percent

2. What is the likelihood of you picking out a chocolate chip cookie?

Impossible   Unlikely   Even Chance   Likely   Certain

$\frac{0}{12}$ $\frac{3}{12}$ $\frac{6}{12}$ $\frac{9}{12}$ $\frac{12}{12}$

Decimal	Percent

3. What is the likelihood of you picking out an oatmeal raisin cookie?

Impossible   Unlikely   Even Chance   Likely   Certain

$\frac{0}{12}$ $\frac{3}{12}$ $\frac{6}{12}$ $\frac{9}{12}$ $\frac{12}{12}$
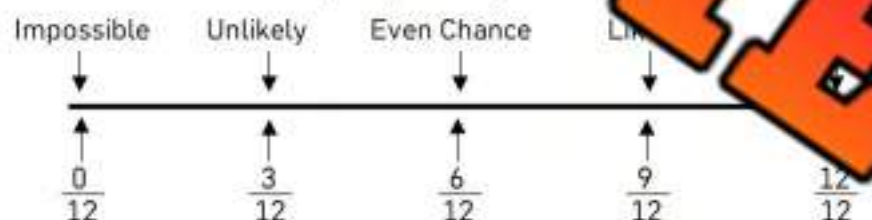
Decimal	Percent

4. What is the likelihood of you picking out a chocolate chip cookie or an oatmeal raisin cookie?

Impossible   Unlikely   Even Chance   Likely   Certain

$\frac{0}{12}$ $\frac{3}{12}$ $\frac{6}{12}$ $\frac{9}{12}$ $\frac{12}{12}$
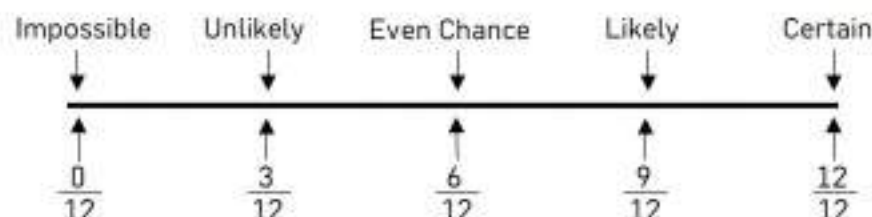
Decimal	Percent

5. What is the likelihood of you picking out an oatmeal raisin cookie or a double chocolate cookie?

Impossible   Unlikely   Even Chance   Likely   Certain

$\frac{0}{12}$ $\frac{3}{12}$ $\frac{6}{12}$ $\frac{9}{12}$ $\frac{12}{12}$
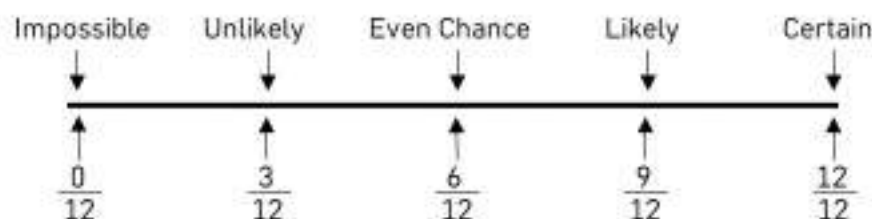
Decimal	Percent

Describing the Likelihood of Events

Marbles

There are 20 marbles in a bag. What is the likelihood of you pulling out a white, grey, or black marble?

Frequency Table | Fill in the frequency table below

Marble Colour	Frequency
Black	
Grey	
White	

Questions | 1) Describe the probability: impossible, unlikely, equally likely, likely or certain
2) Represent the probability of pulling out a marble as a fraction/decimal/percent

Event		Decimal	Percent
1. What is the probability of pulling out a black marble?			
Probability:			
2. What is the probability of pulling out a grey marble?			
Probability:			
3. What is the probability of pulling out a white marble?			
Probability:			
4. What is the probability of pulling out a black, white, or grey marble?			
Probability:			
5. What is the probability of pulling out a black or white marble?			
Probability:			
6. What is the probability of pulling out a green marble?			
Probability:			

Describing the Likelihood of Events

Candies

There are 20 candies in a bag. What is the probability of you pulling out a red, green or blue candy?

Frequency Table | Fill in the frequency table below

Candy Color	Frequency
Red	
Blue	
Green	

Questions | 1) Describe the probability: impossible, unlikely, equally likely, likely or certain
2) Represent the probability of pulling out ... as a fraction/decimal/percent

Event		Decimal	Percent
1. What is the probability of pulling out a red candy?			
Probability:			
2. What is the probability of pulling out a blue candy?			
Probability:			
3. What is the probability of pulling out a green candy?			
Probability:			
4. What is the probability of pulling out a red, blue, or green candy?			
Probability:			
5. What is the probability of pulling out a blue or green candy?			
Probability:			
6. What is the probability of pulling out a purple candy?			
Probability:			

Describing the Likelihood of Events

Gumball Machine

There are 24 gumballs in a machine. What is the likelihood of you pulling out a red (R), yellow (Y), green (G), or blue (B) gumball?

Frequency Table | Fill in the frequency table below

Marble Colour	Frequency
Red	
Blue	
Yellow	
Green	

Questions
1) Describe the probability: impossible, unlikely, equally likely, likely or certain
2) Represent the probability of pulling out a gumball as a fraction/decimal/percent

Event		Decimal	Percent
1. What is the probability of pulling out a green gumball?			
Probability:			
2. What is the probability of pulling out a red gumball?			
Probability:			
3. What is the probability of pulling out a blue or green gumball?			
Probability:			
4. What is the probability of pulling out a red or yellow gumball?			
Probability:			
5. What is the probability of pulling out a blue, red, yellow, or green gumball?			
Probability:			
6. What is the probability of pulling out a pink gumball?			
Probability:			

Theoretical Probability - 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) Rolling a 1?

Fraction	Decimal	Percent

2) Rolling a 5 or 6?

Fraction	Decimal	Percent

3) Rolling an odd number?

Fraction	Decimal	Percent

4) Rolling two six-sided dice and getting a 5?

Fraction	Decimal	Percent

5) Rolling two six-sided dice and getting a 1, 2, or 3?

Fraction	Decimal	Percent

6) Rolling two six-sided dice and getting an even number?

Fraction	Decimal	Percent

7) Rolling two six-sided dice and getting a 6?

Fraction	Decimal	Percent

Theoretical vs Experimental Probability

Theoretical Probability What <u>should</u> happen <u>Example</u> – The theoretical probability of flipping a heads is 1 time out of 2 or ½.	**Experiment Probability** What <u>did</u> happen after the event (experiment) <u>Example</u> – You flipped a coin 10 times and got 7 heads. The experimental probably is 7/10.

Part 1 — Write the theoretical probability of the events happening below

Question	Fraction
1) What is the theoretical probability of flipping a heads?	
2) What is the theoretical probability of flipping a tails?	
3) What is the theoretical probability of flipping a heads if you flipped the coin 20 times?	

Part 2 — Experimental Probability – Flip a coin 20 times and record your results

1) How many heads and tails do you think you will get out of 20 flips?

Heads	Tails
	20

2) Perform the experiment by flipping a coin 20 times. Record how many heads and 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.

_____

_____

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 or Experimental
1) If your ba___ ___erage is 0.300, you should get a hit 3 out of 10 time___	Theoretical Experimental
2) You flip___d a co___ ___and___ot heads 4 times	Theoretical Experimental
3) You made 4 out o___ ___ree-___ ___s ___ ___e basketball game	Theoretical Experimental
4) You won a 50/50 draw after bu___g 1 ti___ ___ ___ sold.	Theoretical Experimental
5) There is a 40% chance that it will rain today	Theoretical ___rimental
6) You have a ¼ chance of pulling out a spade from a deck ___ cards	___retical

Part 2	Is the example theoretical or experimental probability? Wr___ ___e fraction

Example	Theoretical or Experimental	Fraction
1) You should get a hit in baseball twice in every 5 at bats.		
2) The Weather Network says there is a 75% chance of it snowing today.		
3) You pulled a diamond card 7 out of 20 times from a deck of cards		

Theoretical vs Experimental Probability - Sock Drawer

Part 1	Write the theoretical probability of the events happening below

Your sock drawer is a mess! You have 50 socks in there in 5 different colours – white, blue, black, green, and red. Here is the breakdown of the socks in your drawer.

Colour of Sock	White	Yellow	Black	Green	Red
Number of Socks	18	8	14	4	6

1) If you rea... the drawer 50 times without looking, what is the theoretical probability that you w... of the colours below.

...of Soc...	White	Yellow	Black	Green	Red
Fraction					

Part 2	Complete the e...erim... ...perimental probability

2) Close your eyes and point to a random s...ot in the ...belo... your eraser. Repeat this for 50 trials and tally your results below.

W R B Y W B W ... B W
B W W R B W B Y B Y G
Y B B G W Y R W B W B W
B Y G W G W Y R R R W Y

Colour of Sock	White	Yellow	Black	Green	Red
Tally					
Fraction					
Percent					

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   Write the theoretical probability of the events happening below

Theoretical Probability	Fraction
1) ___ a 1 on ___ d dice	
2) Rolling a ___ ed ___	
3) Rolling a 2 or ___ n a ___	
4) Rolling a 6 on a 6-sid ___	

Part 2   Follow the instructio ___ ow to ___ te the experiments

1) Roll the dice 6 times. Tally your results

1	2	3		6

2) Roll the dice 60 times. Record how many of each number you get.

	1	2	3	4	5	6
Tallies						
Fraction						

3) Did the experimental probability get closer to the theoretical probability when you rolled the dice more times? Explain why this happens.

_____

_____

Describing Probability - Cars Passing By

Josh watched the cars pass by his house today. He took note of how many people were in each car. He filled out the frequency table below.

Number of People in Car	1	2	3	4	5	Total
Number of Cars	45	71	34	18	10	
F						
Perc						

Questions   Answer the questions below
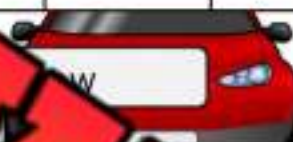
1) Fill in the table above using a fraction, decimal, and percent.

2) Estimate the probability that the next car to pass has one person in it

3) Estimate the probability that the next car to pass has more in

4) Estimate the probability that the next car to pass has at least 4 people in it.

5) Estimate the probability that the next car to pass has at least 2 people in it.

6) If you had to guess, how many people do you think would be in the next car? Explain.

Sports Statistics

Questions | Baseball Statistics – 2021 Regular Season Offensive Statistics

Vladamir Guerrero Jr. had an impressive MLB season in 2021. His number of hits are listed below.

	Singles	Doubles	Triples	Home Runs	Total Hits
Type of	115	21	1	51	
Fre					
Decimal					
Percent					

Questions | Answer the questions below

Question		Percent
1) When Guerrero gets a hit, what is the probability he will		
	i) get a double	
	ii) get a single	
	iii) get a triple	
	iv) get a home run	
2) Guerrero had 600 at bats last year. What is the probability he will get hit?		
3) In baseball, a player's batting average is the probability of them getting a hit shown as a decimal. What was Guerrero's batting average in 2021?		

Probabilities

Questions	Answer the questions below

1) In Regina on New Years Day, it has snowed 21 of the last 50 years.

a) What is the probability of it snowing on New Years Day as a…

Fraction	
Decimal	
Percent	

b) Describe the likelihood of it snowing next New Years Day – likely, unlikely, equally ___ , ___ possible.

2) A survey of 20 000 new ___ buyers fou ___ 50 buyers had a major mechanical problem in the first year they ___ ir ___

a) What is the probability of…

i) Having a mechanical issue in the fi ___ r as a ___

ii) Not having a mechanical issue in the first ye ___ ction

3) A hockey team played 45 games last year. Their results are below ___ ___ , ties)

W	T	L	W	W	L	W	L	L	W	L	W		W	L
L	W	T	W	L	W	L	W	T	W	W	L	W	W	L
L	W	L	L	W	L	L	W	W	L	W	W	L	T	W

Fill in the table below.

Results				Total
Fraction				

Name: _____

Unit Quiz - Probability

Part 1   Fill in the table below

People at a gym are asked what their favourite exercise equipment is. Their results are below.
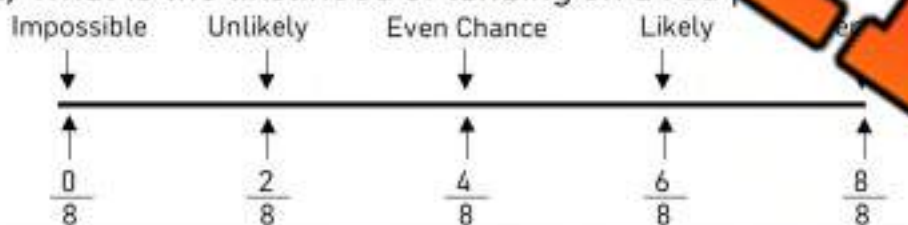
Category	Treadmill	Bike	Elliptical	Rower	Total
Votes	58	42	18	22	
F					
Decimal					
Percentage					

Part 2   Read the spinner and circle the likelihood of each scenario. Then write the fra...

1) What is the likelihood of landing on a red part?

Impossible	Unlikely	Even Chance	Likely		
↓	↓	↓	↓		Decimal	Percent

$\frac{0}{8}$ $\frac{2}{8}$ $\frac{4}{8}$ $\frac{6}{8}$ $\frac{8}{8}$

2. What is the likelihood of landing on a blue part?

Impossible	Unlikely	Even Chance	Likely	Certain
↓	↓	↓	↓	↓

$\frac{0}{8}$ $\frac{2}{8}$ $\frac{4}{8}$ $\frac{6}{8}$ $\frac{8}{8}$

Decimal	Percent

3. What is the likelihood of landing on a red or yellow part?

Impossible	Unlikely	Even Chance	Likely	Certain
↓	↓	↓	↓	↓

$\frac{0}{8}$ $\frac{2}{8}$ $\frac{4}{8}$ $\frac{6}{8}$ $\frac{8}{8}$
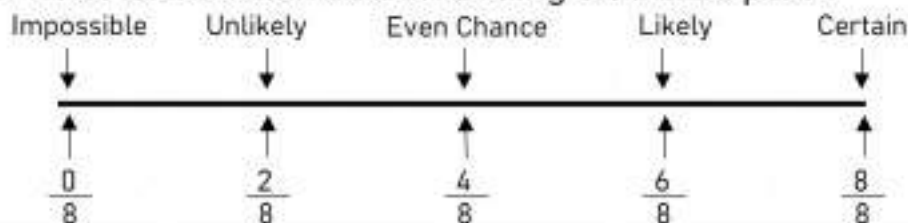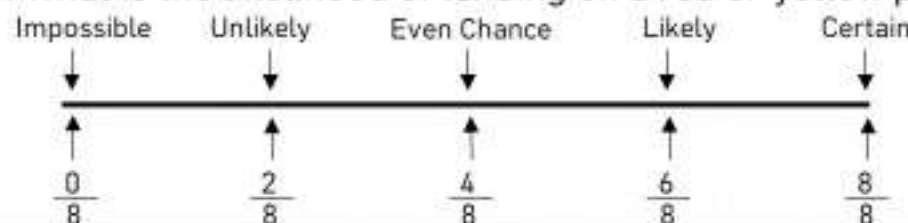
Decimal	Percent

Marbles

There are 30 marbles in a bag. What is the likelihood of you pulling out a white, grey, or black marble?

Part 3 | Fill in the frequency table below

Marble Colour	Frequency
Black	
White	

Part 4
1) Describe the probability: impossible, unlikely, equally likely, likely or certain
2) Represent the probability of pulling out a marble as a fraction/decimal/percent
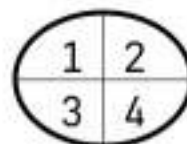
Event	Fraction	Decimal	Percent
1. What is the probability of pulling out a marble?			
Probability:			
2. What is the probability of pulling out a grey marble?			
Probability:			
3. What is the probability of pulling out a white marble?			
Probability:			
4. What is the probability of pulling out a black, white, or grey marble?			
Probability:			
5. What is the probability of pulling out a black or white marble?			
Probability:			
6. What is the probability of pulling out a green marble?			
Probability:			

1	2
3	4

1) Rachel conducts an experiment and spins a spinner 20 times.

4	2	1	3	3	1	3	2	1	1
2	3	3	4	2	3	1	2	1	3

a) Fill in the table below

Results					Total
...tion					
Perc...					

b) If Rachel spun the _[spinner]_ **...** you think she would have more equal results, or would the results be ...

2) Stephanie records the speed that cars drive by ... limit is 40 kph.

Speeds	0-20	21-			tal
Frequency	118	314			
Fraction					
Decimal					
Percent					

a) Represent the probability using a percentage of...

🚗	i) the next car driving 20 kph or less by her house	
🚙	ii) the next car driving illegally (speeding) by her house	
🚘	iii) the next car driving legally (not speeding) by her house	