



# Preview - Information



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# Google Slides Lessons Preview





# Ontario Math Curriculum Data Literacy & Probability – Grade 6

## 3-Part Lesson Format

### Part 1 – Minds On!

- Learning Goals
- Discussion Questions
- Quotes
- And More!

**SAMPLING METHODS**

**Learning Goal**

We are learning to analyse and compare different sampling methods, using examples and reasoning, so we can determine which samples fairly represent a population and explain how sampling choices affect the results of data.

**SAMPLING METHODS**

Which type of sampling method was used in the examples below?

Sampling Method	Sampling Method
1. A survey of 100 students in a school.	Systemic Sampling
2. A survey of 100 students in a school.	Stratified Sampling
3. A survey of 100 students in a school.	Systemic Sampling

### Part 2 – Action!

- Writing
- Matching
- Drag and Drop
- Drawing
- And More!

### Part 3 – Consolidation!

- Exit Cards
- Quizzes
- Reflection
- And More!

**SAMPLING METHODS**

Match which sampling method would be best for each situation below.

Situation	Sampling Method
1. A survey of 100 students in a school.	Systemic Sampling
2. A survey of 100 students in a school.	Stratified Sampling
3. A survey of 100 students in a school.	Systemic Sampling




# Ontario Math Curriculum Data Literacy & Probability – Grade 6

## DISCRETE OR CONTINUOUS DATA

Planning a School Carnival: You are helping plan a school carnival. You ask the event organizer the questions below. Is the data you receive **discrete** or **continuous**?

Questions	Discrete / Continuous
How many booths will there be?	
How long will the carnival last in hours?	
How many prizes were sold last year?	
What will the temperature outside during the carnival?	
How many balloons will be bought?	
How much money was raised last year?	
How many prizes are available?	
How long does it take to set up each booth?	
How many prizes does each booth have to sell?	
How many balls of cotton candy are sold?	

Discrete Data  
 Continuous Data



## FINDING THE MEAN

Find the mean for the following data sets. Add the total stickers and find their share. Share equally.

Stickers	Mean
1 2 3 4 5 6 7 8 9 10	Mean: _____
1 2 3 4 5 6 7 8 9 10	Mean: _____
1 2 3 4 5 6 7 8 9 10	Mean: _____
1 2 3 4 5 6 7 8 9 10	Mean: _____

## Find the mean and mode of each data set.

<b>Favorite Fruit Survey</b> 1 2 3 4 5 6 7 8 9 10	<b>Favorite Color Survey</b> 1 2 3 4 5 6 7 8 9 10	<b>Favorite Sport Survey</b> 1 2 3 4 5 6 7 8 9 10	<b>Favorite Animal Survey</b> 1 2 3 4 5 6 7 8 9 10
Mean: _____ Mode: _____	Mean: _____ Mode: _____	Mean: _____ Mode: _____	Mean: _____ Mode: _____
<b>Favorite Movie Survey</b> 1 2 3 4 5 6 7 8 9 10	<b>Favorite Book Survey</b> 1 2 3 4 5 6 7 8 9 10	<b>Favorite TV Show Survey</b> 1 2 3 4 5 6 7 8 9 10	<b>Favorite Game Survey</b> 1 2 3 4 5 6 7 8 9 10
Mean: _____ Mode: _____	Mean: _____ Mode: _____	Mean: _____ Mode: _____	Mean: _____ Mode: _____



# Ontario Math Curriculum Data Literacy & Probability – Grade 6

## TYPES OF GRAPHS

Label the names of the graphs below.

			<input type="text"/>
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- 
- 
- 
- 
- 
- 

## PICTOGRAPH

Create a pictograph based on the data below.

Category	Value
Apples	10
Bananas	15
Oranges	20
Pears	12
Strawberries	18

1 pictograph = 5 units

## SCALE

Draw a scale for the data below.

Category	Value
Apples	10
Bananas	15
Oranges	20
Pears	12
Strawberries	18



# Workbook Preview



## Grade 6

### D1. – Data Literacy

	Curriculum Expectations	Pages That Cover the Expectations
<b>D1.1</b>	describe the difference between discrete and continuous data, and provide examples of each	15 – 18, 32 – 33, 48, 61, 69
<b>D1.2</b>	collect qualitative data and discrete and continuous quantitative data to answer questions of interest about a population, and organize the sets of data as appropriate, including using	5 – 14, 36, 46, 48, 52, 56, 61, 63, 69
<b>D1.3</b>		15, 47, 64, 67, 100
<b>D1.4</b>	create an infographic about a data set, representing the data in appropriate ways, including in tables, histograms, and broken-line graphs, and incorporating any other relevant information that helps to tell a story about the data	77 – 80
<b>D1.5</b>	determine the range as a measure of spread and the measures of central tendency for various data sets, and use this information to compare two or more data sets	19 – 31, 34 – 36, 52, 59 – 61, 63
<b>D1.6</b>	analyse different sets of data presented in various ways, including in histograms and broken-line graphs and in misleading graphs, by asking and answering questions about the data, challenging preconceived notions, and drawing conclusions, then make convincing arguments and informed decisions	34 – 40, 50 – 52, 54 – 55, 58 – 60, 65 – 66, 81 – 98

Preview of 100 pages from  
this product that contains  
240 pages total.

## Sampling a Population

### What is a Population

A **population** is the total set of subjects that fit a particular description. For example, students in Ontario is a population that would include all the students in Ontario.



### Sampling a Population

When we want to know something about a population, it is easier to ask a sample of the population than asking everyone within that population. For example, if we wanted to know if the students in Ontario preferred Math to Science, we could ask 10% of the population instead of every student in Ontario. We can assume that the remaining 90% of the population would vote in the same way.

Sampling a population saves us a lot of time and money. It works well if we sample a representative population. If we went to a Science and Technology school in Ontario and asked them if they preferred Math or Science better, they would likely all say Science. This is not a representative sample of the population.

### Instruction

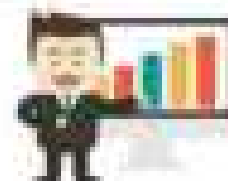
Write a survey question that would **not** be a good representation of the population.

Population	Survey Question	Good Sample
Pet Owners in Ontario	What is the best pet?	Ontario
Parents of Ontario	Which sport is best for kids?	
Students in Ontario	Which city is the best?	
University Students in Ontario	Which university is the best?	
Kids who own a PS5	Which PS5 game is the best?	
Hockey players in Ontario	Which sports store is the best?	
Teachers in Ontario	Which school is the best in Ontario?	

## Sampling Techniques

### Random Sampling

When we select people in a population randomly. Each person in the population has an equal chance to be selected. For example, using a computer generator to randomly choose people from a list.



### Stratified Random Sampling

Taking a population and splitting them into groups and then random sampling the groups separately. For example, a school population could be divided into two groups: (1) students who take a bus and (2) those who don't take a bus. A survey could be given to both groups by selecting 10% of the people in both groups. We can learn more information about both groups by using stratified random sampling.

### Systematic Random Sampling

Systematic random sampling is when you choose a random sampling strategy before beginning a survey. For example, a sample of 100 people could be chosen from an alphabetized list of names, using a starting point and selecting every fourth name to be randomly chosen.

**Part 1** Write which type of sampling is being used in the examples below

Example of a Sampling Technique	Sampling Technique
1) Deciding randomly to choose every 5 <sup>th</sup> person in a line	
2) Having a computer call 10% of Ontario teachers	
3) Splitting the elementary student population into primary and secondary	
4) Using a computer to randomly email 20% of the customers of a business	
5) Deciding to hand out surveys to every 10 <sup>th</sup> customer who enters a store	

**Part 2** Which sampling technique would you use in the situations below

Situation	Sampling Technique
1) You want to know if more men or women prefer your pizza	
2) You have a mailing list on your computer and want to sample 20% of them	
3) You work at a store and want to survey every 10 people that come in	
4) You are trying to sample 20% of everyone in Ontario by calling them	
5) You want to sample the grade 5 and grade 6 students in Toronto	

## Qualitative vs Quantitative Data

### Quantitative data

Data that uses numbers (measured, counted)  
- length, height, area, weight, time, etc.

### Qualitative data

data that uses words (categories)  
- choices, favourites, foods, colours, etc.

**Questions** Read the description of the data and circle if it is quantitative or qualitative.

1) Money spent on sale last month	Quantitative Qualitative
2) Heights of children in grade 6	Quantitative Qualitative
3) Favourite foods of the students in your class	Quantitative Qualitative
4) Rainfall in April last year	Quantitative Qualitative
5) Favourite colours of the students in your class	Quantitative Qualitative
6) The weight of different hockey skates	Quantitative Qualitative
7) The height of the grade 6 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

Image #1



Image #2



## Part 1

Write quantitative observations about image #1 and put an x if it is quantitative or qualitative

Observations	Quantitative	Qualitative
1) The vehicle has 4 wheels	x	
2) The vehicle has 2 doors		
3) The vehicle is white		
4) The vehicle's age is 3 years		
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 quantitative and qualitative observations about image #2

Observations	Quantitative	Qualitative
1)		
2)		
3)		
4)		
5)		

## Discrete or Continuous Data?

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

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

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

Question: In which question discrete or continuous?



Tip: Ask yourself, "can you split the number in half?"

	Discrete/Continuous
1. How many cm of snowfall were there?	
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?	

# Exit Cards

Cut Out

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

Name: \_\_\_\_\_

Is the research question discrete or continuous?

Research Question	Discrete/Continuous
How many times did the phone ring today?	
How many different species of birds did you observe on your nature walk?	
How many seconds did it take for the ice to melt completely?	
How many beats per minute is your resting heart rate?	

Name: \_\_\_\_\_

Is the research question discrete or continuous?

Research Question	Discrete/Continuous
How many times did the phone ring today?	
How many different species of birds did you observe on your nature walk?	
How many seconds did it take for the ice to melt completely?	
How many beats per minute is your resting heart rate?	

Name: \_\_\_\_\_

Is the research question discrete or continuous?

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Name: \_\_\_\_\_

Is the research question discrete or continuous?

Research Question	Discrete/Continuous
How many times did the phone ring today?	
How many different species of birds did you observe on your nature walk?	
How many seconds did it take for the ice to melt completely?	
How many beats per minute is your resting heart rate?	

**PREVIEW**

## 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 answer he gives you **discrete** or **continuous**?

Question Collected	Discrete/Continuous
1) How many doors does the car have?	
2) How old is the car?	
3) How many litres does the tank hold?	
4) How many wheels does the car have?	
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 50km/hour?	
11) How long is the car?	
12) How many decibels do the speakers produce?	

PREVIEW

## 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 on the team?	
2) How tall are they?	
3) How many points scored in a game?	
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	

**MEAN**

When we calculate the mean, we are finding the average of a set of numbers.

**Example:** Three brothers named Josh, Cameron, and Morgan went on an easter egg hunt. Josh found 6 eggs, Cameron found 4, and Morgan found 5. At the end of the hunt, their mother told them to split the eggs equally. So, they decided to put all the eggs in the middle and then divide them equally amongst themselves. They had  $6 + 4 + 5 = 15$  eggs and  $15 \div 3$  kids = 5 eggs each.

**Questions**

Calculate the mean for each set of numbers. Write the total up the candy and then fair share it.



# MEAN

**Mean** - the average in a set of data

**Step 1:** Add the numbers in the data set

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

**Example:**

Data set: 5, 10, 8, 5

Step 1:  $5 + 10 + 8 + 5 = 28$

Step 2:  $28 \div 4 = 7$



Question: Find the mean for each data set below

1) 5, 10, 8, 5	2) 11, 18, 5, 6
3) 22, 18, 16, 20	4) 30, 25, 25, 20
5) 18, 28, 15, 35	6) 45, 30, 25, 20
7) 15, 22, 18, 20, 35	8) 71, 85, 64, 79, 56
9) 86, 102, 107, 95, 85	10) 147, 162, 183, 158, 165

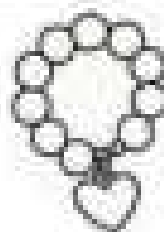
## Calculating Mean – Word Problem

**Questions**

Answer the question below

1) Jamie sold handmade bracelets over six days. She earned \$24 on Monday, \$30 on Tuesday, \$18 on Wednesday, and on Thursday she had to refund \$6 to a customer. On Friday and Saturday, she earned a total of \$64.

What was her average daily earnings over those six days?



2) Over the course of a week, Ava tracked how long she spent on homework each day. On Monday, Tuesday, and Wednesday, she spent 45, 60, and 75 minutes, respectively. On Thursday and Friday, she forgot to record her times, but she knows she spent a total of 110 minutes on those two days combined. On Saturday, she spent 90 minutes, and on Sunday, she studied for 80 minutes.

What was her average daily homework time over the 7 days?



## Estimating the Mean

The **mean** is the average number in a data set. When we understand what the mean of a data set is, we can estimate the mean easily without doing any calculations.

For example, in the data set: 22, 18, 16, 25, 20, we can estimate that the mean will be approximately 20, without doing any calculations. This is because the mean has to be between 16 and 25. We can also see that there are two numbers above 20, and two numbers below 20.

**Question:** Estimate the mean by circling one of the options  
or your answer by calculating the mean

1) 11, 12, 13, 14, 15	2) 32, 38, 40, 30, 35
a) 18 b) 15 c) 20 d) 12	a) 30 b) 41
3) 65, 78, 63, 70, 76	4) 85, 75, 70, 98
a) 82 b) 70 c) 65 d) 76	a) 85 b) 75 c) 70 d) 75
5) 94, 102, 91, 85, 83	6) 105, 100, 95, 102
a) 102 b) 83 c) 85 d) 91	a) 105 b) 109 c) 100 d) 95
7) 112, 125, 118, 110, 125	8) 142, 120, 135, 125, 153
a) 125 b) 110 c) 118 d) 112	a) 135 b) 142 c) 125 d) 153

## Estimating the Mean – Word Problem

**Questions**

Answer the question below



A class of students tracked how many jumping jacks they could each do in one minute. The results for 10 students were:

48, 53, 45, 51, 60, 58, 49, 62, 47, 50

1) Estimate the number of jumping jacks without calculating it.

2) Calculate the exact mean.

3) The gym teacher says that any class with a mean of at least 55 jumping jacks will get to move on to a regional fitness challenge. Will the class qualify?

4) The teacher decides to let two more students try. They score 65 and 60 jumping jacks. Estimate the new class mean.

5) Then calculate the exact mean again to determine if these two scores raise the overall class average to at least 55.

**PREVIEW**

## MODE

**Mode:** The number that occurs the most in a data set. The mode is used to calculate data in nominal data sets.

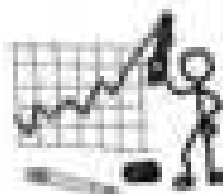
**Step 1:** Order the numbers from least to greatest

**Step 2:** Find the number or numbers that show up the most - You can have zero mode or more than one mode.

**Example:** 5, 7, 3, 9, 11

7, 9, 11

**Answer:** 3



	Ordered List	Mode
1) 28, 52, 44, 32, 52		
2) 74, 81, 94, 81, 78, 81		
3) 183, 145, 167, 191, 183		
4) 201, 218, 214, 218, 214, 218		
5) 311, 361, 311, 361, 361, 351		
6) 518, 501, 562, 501, 561, 571		
7) 781, 772, 713, 781, 713, 713		

1) Seven students from grade 6 were surveyed, asking them their favourite number from 0-100. The results are presented in the data set below.

91, 78, 75, 84, 68, 75, 91, 84, 93, 85, 91

Which number is the mode (the most popular)? \_\_\_\_\_

2) Adults were asked to choose a number from the food menu. The results are represented in the data set.

2, 4, 2, 2, 3, 4, 1, 3, 3, 1, 4, 4, 3, 2, 2, 1, 2, 3, 1

Which food choice is the mode? \_\_\_\_\_



1	Fish
2	Chicken
3	Steak
4	Vegetables

Name: \_\_\_\_\_


# Mean and Mode




Hockey Goals							
5	9	6	2	9	6	5	6
Mean: _____							
Mode: _____							

Basketball Points						
24	29	35	29	33	24	29
Mean: _____						
Mode: _____						

**PREVIEW**

Minutes Read Per Day						
31	38	41	50	41	38	41
Mean: _____ 						
Mode: _____						

Test Scores			
91	95	88	83
Mean: _____ 			
Mode: _____			

## MEDIAN

**Median:** The median is the middle number in a data set.

**Step 1:** put the numbers in order from smallest to largest

**Step 2:** circle the number in the middle.



\*\*\* If there is an even amount of numbers in the data set, add the two numbers in the middle together and divide by 2. This is the median.

	Ordered List	Median
8, 10, 12, 15, 18	4, 7, (8, 8), 12, 15	$8 + 8 = 16$ $16 \div 2 = 8$
25, 37, 41, 58, 61, 92		
84, 106, 102, 121, 138, 116, 92		
135, 167, 152, 118, 162, 192		
264, 241, 249, 216, 284, 255		
324, 375, 308, 362, 358, 350		
425, 382, 405, 448, 403, 411		

## Calculating Median – Word Problem

**Questions**

Answer the question below

1) Jay wrote down how much money he spent on snacks over the last 10 days:

5.25, 4.75, 6.50, 5.00, 5.25, 7.00, 6.00, 5.75, 5.50, 6.25

He wants to know the median amount he spent per day. What is it?

2) Hannah recorded the (in minutes) from an athlete's training:

12.1, 11.9, 12.2, 12.3

She wants to beat her time in the next week. What is her median time, and what time would she have to beat?

3) Liam tracked the number of minutes he spent reading in a week:

**Monday:** 15 minutes    **Tuesday:** twice as much as Monday    **Wednesday:** 10 minutes more than Monday    **Thursday:** 10 minutes less than Tuesday    **Friday:** 20 minutes more than Wednesday    **Saturday:** 25 minutes    **Sunday:** a quarter as much as Thursday

What is the median number of minutes Liam spent reading in a day?



# RANGE

**Range:** The range is the difference between the biggest and smallest number in a data set.

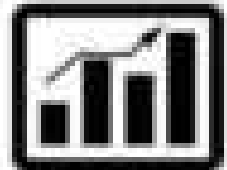
**Step 1:** Find the largest number and the smallest number.

**Step 2:** Subtract the smallest number from the largest number.

**Example:** 13, 74, 37, 18, 32

**Step 1:** 13 = smallest    74 = largest

**Step 2:**  $74 - 13 = 61$



**Part 1** Find the range of the data sets below

		Calculations	Range
1)	0, 1, 2, 3, 4, 5, 6, 7, 8	$8 - 0 = 8$	8
2)	61, 75, 81, 92, 100, 110		
3)	85, 95, 81, 106, 132, 8		
4)	205, 135, 178, 171, 164, 199		
5)	234, 241, 258, 226, 231, 247		
6)	318, 365, 343, 352, 368, 376		
7)	433, 418, 427, 406, 448, 439		
8)	518, 475, 428, 598, 604, 410		

**Part 2** Find the range in the word problems below

1. Robin collects strawberries for her summer job. She records how many strawberries she collects each day for a week. What is the range of strawberries she collects?

471, 528, 374, 486, 598, 666, 643

2. Steven records how many minutes of screen time he uses on his phone each week. His results for 6 weeks are listed below. What is the range?

247, 311, 485, 375, 201, 399

## Calculating Range – Word Problem

**Questions**

Answer the question below

1) A bakery sells 5 types of cookies in different quantities each day.

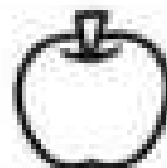
On Monday, they sold 185 chocolate chip, 212 sugar, 199 oatmeal, twice as many ginger snaps as sugar cookies, and 175 peanut butter cookies.

What is the range of the number of cookies sold?

2) A farmer collected apples from 5 different fields.

The weights were 850 kg, 820 kg, 870 kg, and one field produced 40 kg more than the others.

What is the range of the weights?

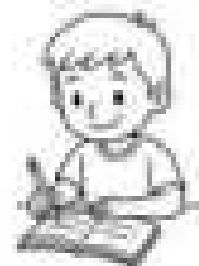


3) Lila collected 600 stickers in one month. She collected 1/4 as many in February, and a quarter as many in March. In April, she collected 300 more than she did in March. What is the range of the number of stickers she collected in these months?

4) A student tracked how many minutes she studied each day.

- Monday – 480 minutes
- Tuesday – half of Monday
- Wednesday – a quarter of Monday
- Thursday – 100 minutes more than Wednesday

What is the range of study times?



# Exit Cards

Cut Out

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

Name: \_\_\_\_\_

Find the range of the data sets below.

Data Set	Calculations	Range
142, 156, 138, 165, 150, 148		
835, 789, 920, 880, 910, 870		

Find the range in the word problem below.

Liam recorded the number of steps he walked each day for a week. The step counts for the 7 days were:

5300, 4700, 4900, 5200, 5100, 4800, 5000

Name: \_\_\_\_\_

Find the range of the data sets below.

Data Set	Calculations	Range
142, 156, 138, 165, 150, 148		
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# Mean, Median, Mode - Decimals



## Questions

Fill in the table using the different measures of central tendency

1)	
Data Set	1.7, 1.9, 2.5, 2.8, 2.1, 1.8, 1.9
Mean	
Median	
Mode	
Range	

2)	
Data Set	8.2, 7.5, 6.4, 7.2, 8.1, 7.5, 8.3
Mean	
Median	
Mode	
Range	


3)	
Data Set	20.3, 23.5, 20.1, 23.5, 21.5, 23.1
Mean	
Median	
Mode	
Range	

4)	
Data Set	2.5, 13.2, 12.4
Mean	
Median	
Mode	
Range	

## Horizontal Pictograph - Candy

A **pictograph** is a graph that displays data using symbols or pictures. Read the pictograph below and answer the questions.

Sam and his friends collected candy on Halloween. The amount of candy each friend collected is displayed below in the pictograph.

Friend	Number of Candies Collected	Frequency
Sam		
Steve		
Tony		
Jill		
Stacy		



= 12 Candies

- |  |  |
|--|--|
| a) How much is one candy worth?  |  |
| b) How much is half a candy worth?   |  |
| c) Who collected the most candy?   |  |
| d) How much more candy did Jill collect than Tony?                               |  |
| e) How much total candy was collected?   |  |
| f) What is the average (mean) number of candies that were collected by the kids? |  |

## Vertical Bar Graph – Favourite Colour

The students in grade 5 were asked which colour was their favourite. The results of the survey have been displayed in the bar graph below.

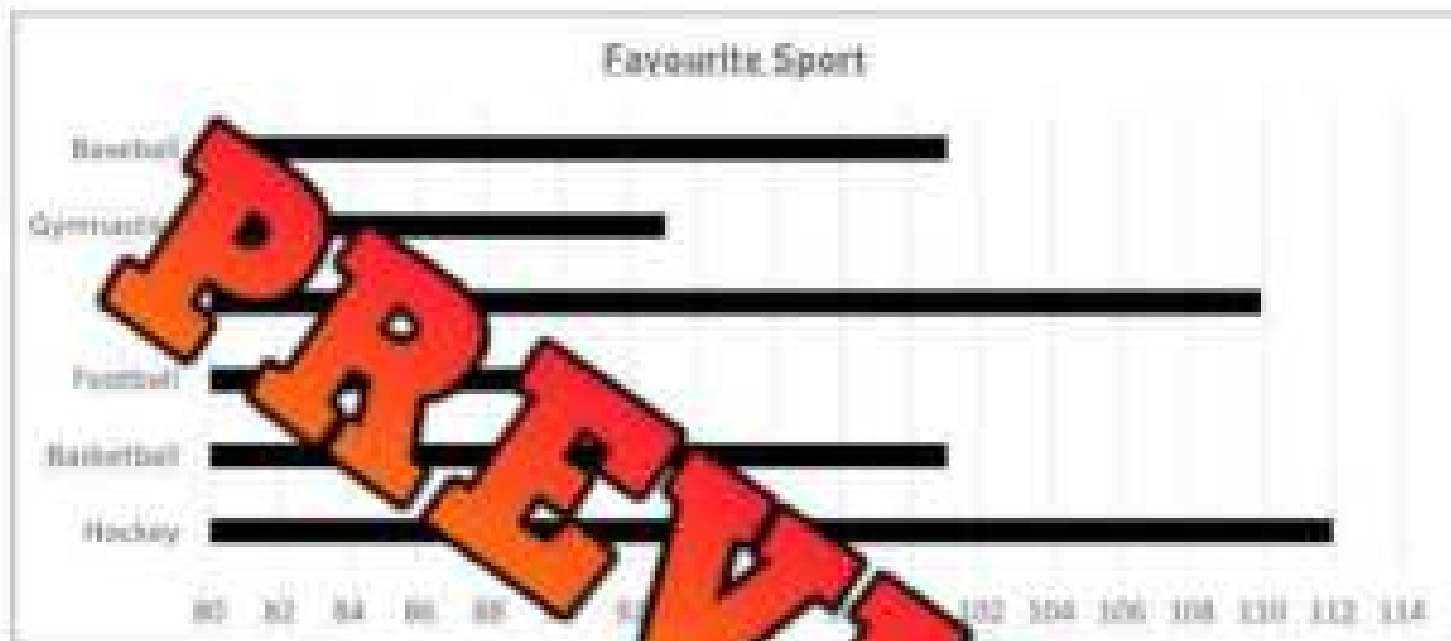


Red	
Blue	
Green	
Yellow	
Purple	
Orange	

- Which colour was most popular?
- Which two colours add up to pink?
- Is the data quantitative or qualitative?
- Is the data discrete or continuous?
- What is the mean in the data set?
- What is the median of the data set?
- What is the mode of the data set?
- What is the range of the data set?
- How many people were surveyed?

## Horizontal Bar Graph – Favourite Sport

The kids at camp were asked which sport they liked the best. They surveyed each kid and the results have been displayed below in a horizontal bar graph.



### Questions

Fill in the tables below

Frequency Table	
Baseball	
Gymnastics	
Soccer	
Football	
Basketball	
Hockey	

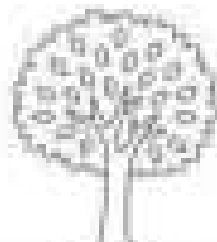
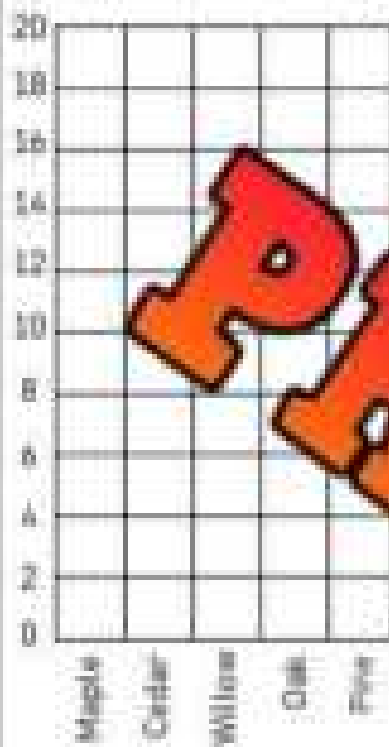
Mean	
Median	
Mode	
Range	

a) Which sport was popular?	
b) Which sport was least popular?	
c) How many people chose gymnastics as their favourite?	
d) How many kids liked basketball and soccer the best?	
e) How many kids liked hockey more than football?	
f) How many kids were surveyed?	

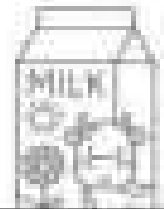
# Drawing Bar Graphs

## Instruction

Draw the bars for each of the many-to-one bar graphs below



Favourite Tree	# of votes
Maple	11
Cedar	1
Willow	1
Oak	1
Pine	1



Favourite Drink	# of points
Milk	15
Water	19
Juice	10
Soda	25
Choc. Milk	20



Favourite Colour	# of votes
Red	32
Blue	41
Green	16
Pink	44
Purple	21



Favourite Pizza Topping	# of votes
Pepperoni	70
Mushroom	25
Onion	45
Bacon	85
Ham	40

# Exit Cards

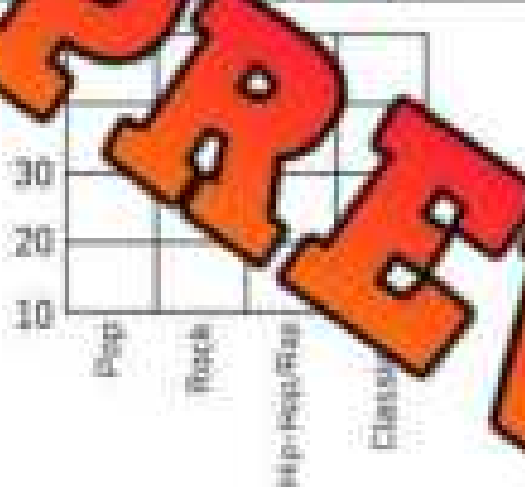
Cut Out

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

Name: \_\_\_\_\_

Draw the bars for the bar graph below.

Music	Pop	Rock	Hip-Hop/Rap	Classical
Votes	30	20	10	40



Name: \_\_\_\_\_

Draw the bars for the bar graph below.

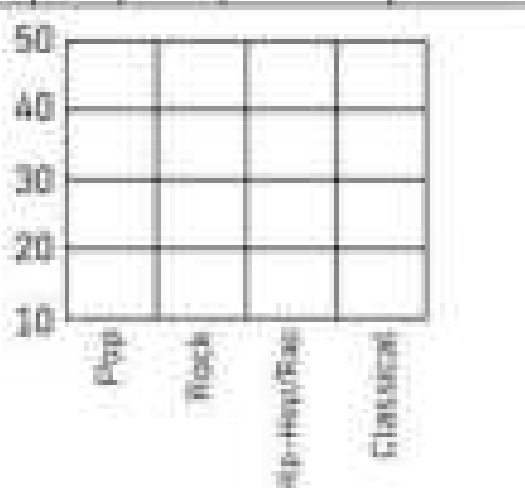
Music	Pop	Rock	Hip-Hop/Rap	Classical
Votes	30	20	10	40



Name: \_\_\_\_\_

Draw the bars for the bar graph below.

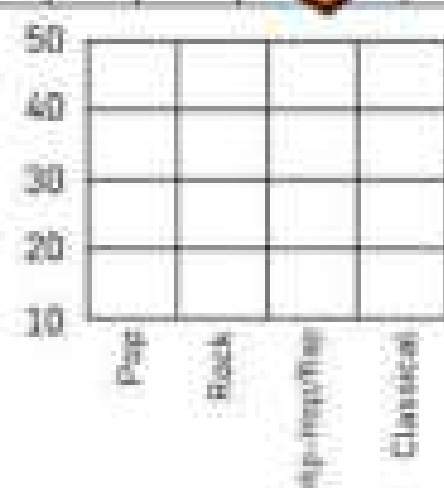
Music	Pop	Rock	Hip-Hop/Rap	Classical
Votes	30	20	10	40



Name: \_\_\_\_\_

Draw the bars for the bar graph below.

Music	Pop	Rock	Hip-Hop/Rap	Classical
Votes	30	20	10	40



**PREVIEW**

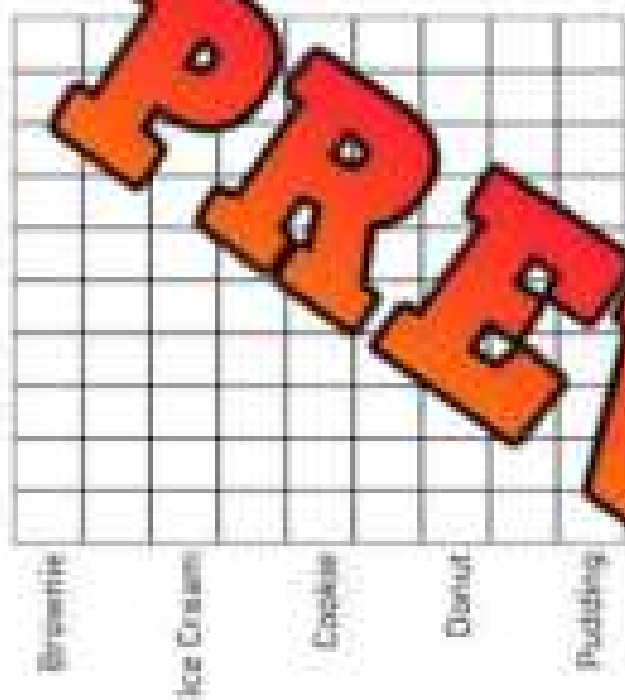
## Creating Scale

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.

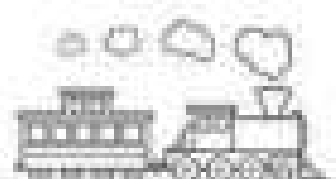
**Step 1:** Look at the data. Find the lowest and highest numbers.

**Step 2:** Count how many lines you have to plot your data.

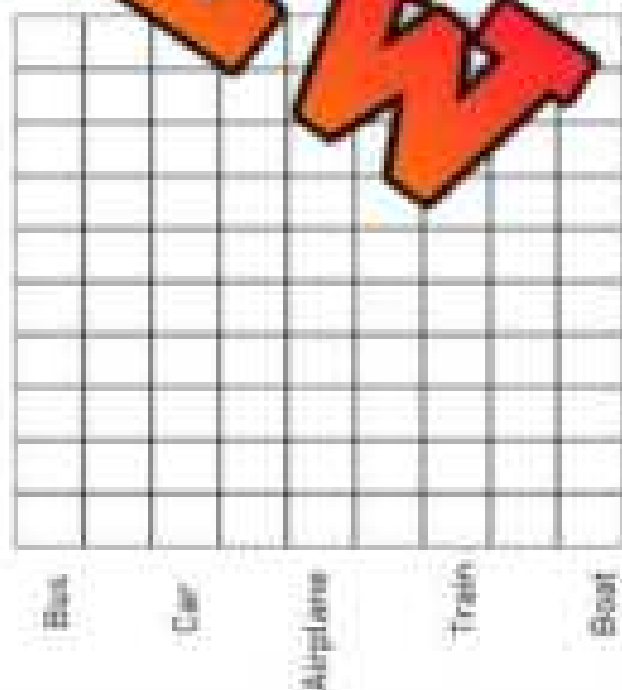
**Step 3:** Decide what to go up by to ensure you have enough space to plot ALL the data.



Favourite Dessert	# of votes
Brownie	23
Ice Cream	27
Cookie	15
Donut	12
Pudding	9



Transportation Method	# of votes
Bus	11
Car	49
Airplane	91
Train	70
Boat	82



## Collecting Quantitative Discrete Data

**Quantitative discrete data** - is data that is collected through counting. We don't use categories, instead we use numbers or intervals.

**Examples** - number of pets, number of siblings, number of goals scored, number of books read this week.



**Intervals** - You can setup your responses into a group of numbers to allow for a larger range of numbers. For example: 0-4, 5-9, 10-14, 15-19, 20-24

**Data Collection** - Collect data by asking the population your survey question.

Survey Question	Numbers/Intervals	Tally	Frequency
Example: How many books did you read this week?			

### Interpreting Your Survey Results

1. Which population did you survey? \_\_\_\_\_
2. Which number/interval was the most popular? \_\_\_\_\_ least popular? \_\_\_\_\_
3. Fill in the table below by calculating the measures of central tendency.

**Note:** You cannot calculate the mean/median if you use intervals.

Mean	Median	Mode	Range

4. What conclusions can you draw from your data? What did you learn?

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## Graphing Quantitative Data

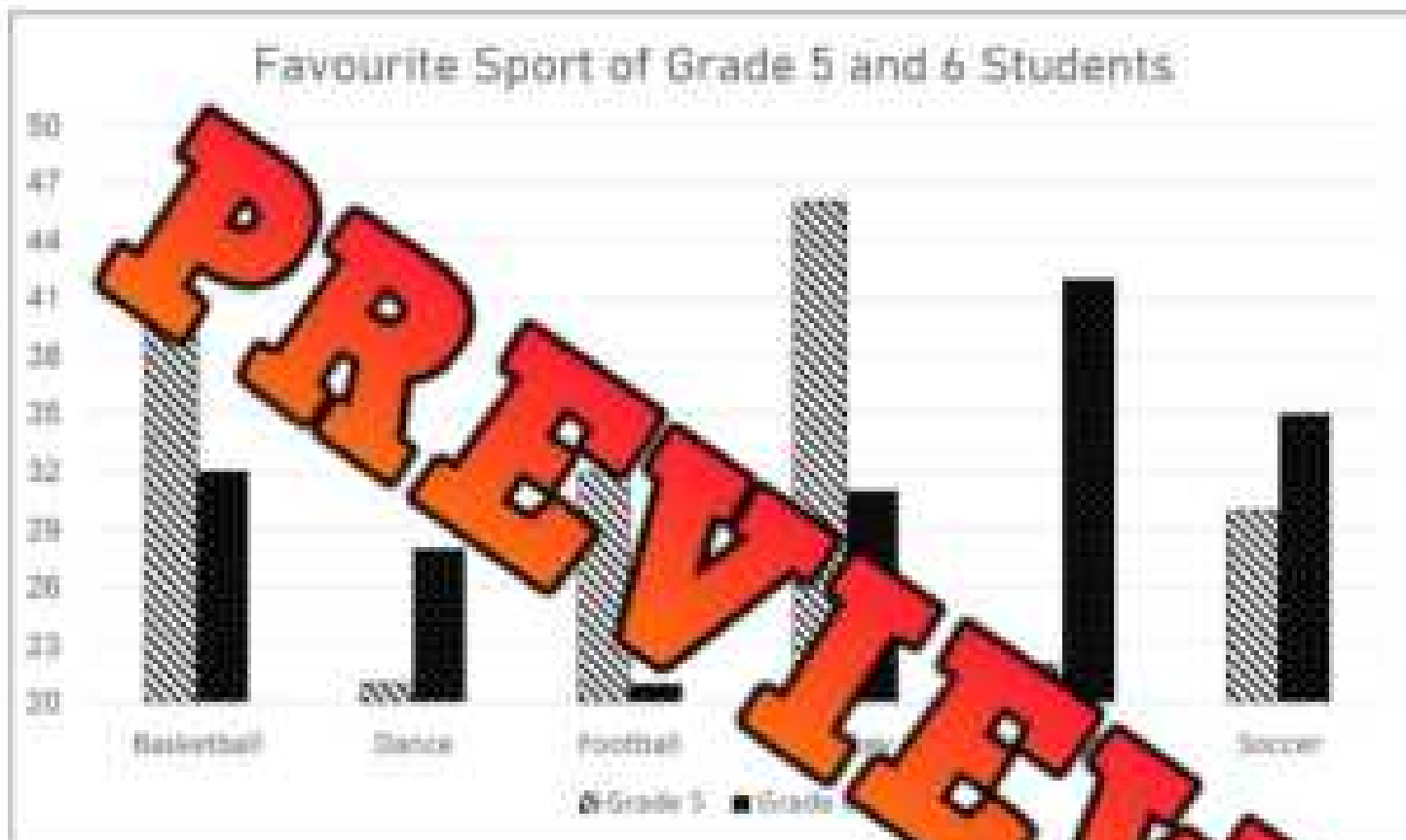
Use the data you collected to plot your graph. Remember the following labels:

X axis label     Y axis label     Title     Scale     Number/Intervals



## Interpreting a Double Bar Graph

The students in grades 5 and 6 were asked which sport was their favourite. The results have been sorted by grade in the double bar graph below.



a) Which sport did the grade 5's like the most?

b) Which sport did the grade 6's like the most?

c) Which sport got the most votes combined?

d) How many more votes did hockey get in total over dance?

e) Did more grade 5s or grade 6s participate in the survey?

f) How many students participated in the survey?

# Exit Cards

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

Name: \_\_\_\_\_

Preferred Learning Styles of Grade 6 Students



1) Which learning style is the most preferred among the students?

2) What is the total number of students who prefer either Visual or Auditory Learning?

Name: \_\_\_\_\_

Preferred Learning Styles of Grade 6 Students

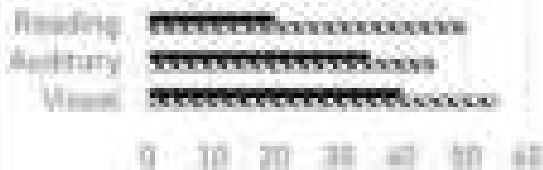


1) Which learning style is the most preferred among the students?

2) What is the total number of students who prefer either Visual or Auditory Learning?

Name: \_\_\_\_\_

Preferred Learning Styles of Grade 6 Students

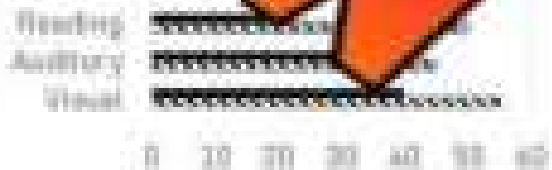


1) Which learning style is the most preferred among the students?

2) What is the total number of students who prefer either Visual or Auditory Learning?

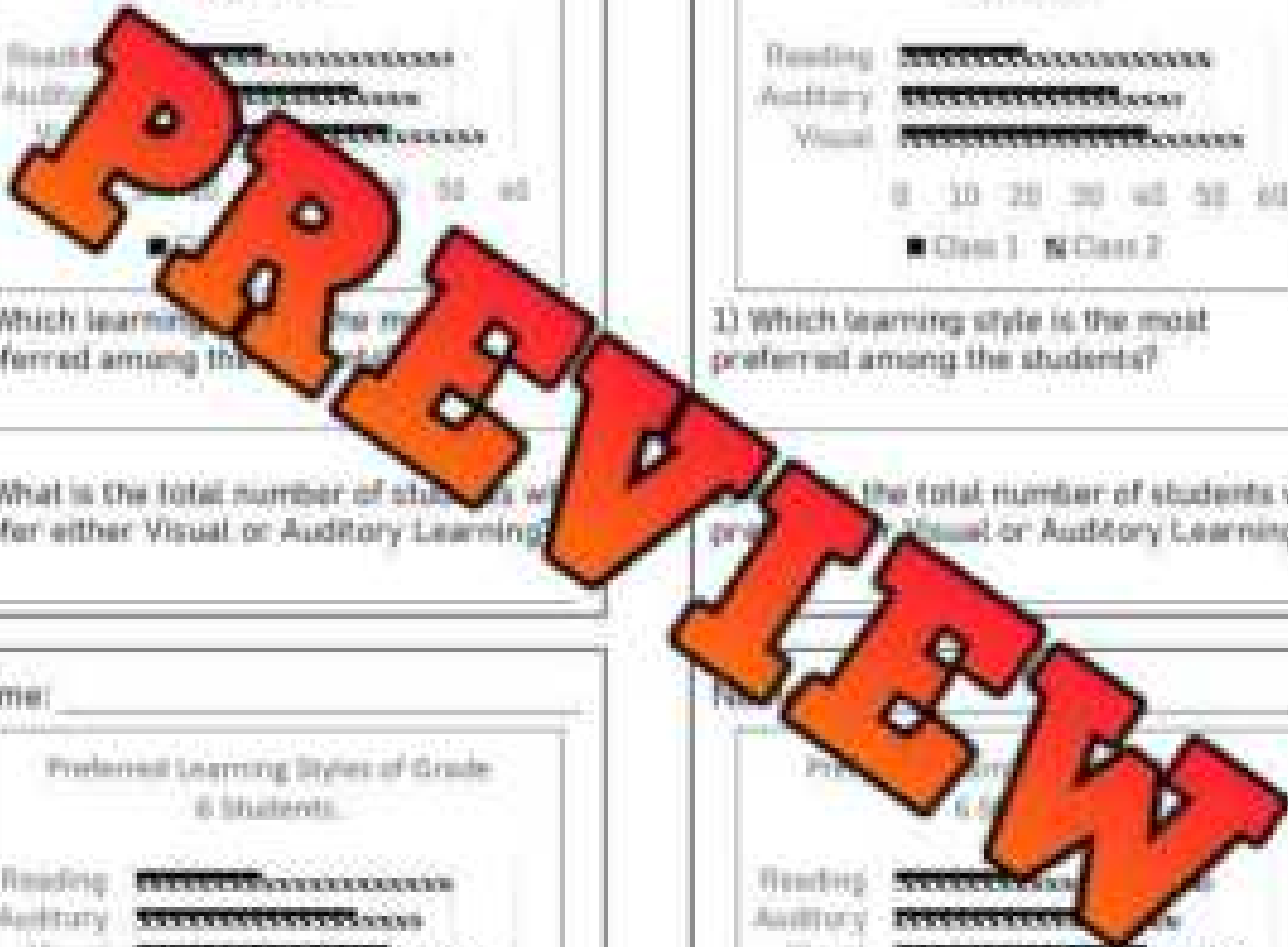
Name: \_\_\_\_\_

Preferred Learning Styles of Grade 6 Students



1) Which learning style is the most preferred among the students?

2) What is the total number of students who prefer either Visual or Auditory Learning?



## Survey: Double Bar Graph

When creating a double bar graph, start by collecting data from two different groups. You could survey teachers vs. students, grade 5s vs. grade 6s, people who studied vs those who didn't.

**Directions:** Complete this organizer to setup your data so you can graph it later. Next, find two groups of people to survey!

<b>Survey Question</b>					
<b>Example</b>					
<b>My Question</b>					
<b>Options</b>					
Group 1	Group 2				
Tally	Tally				

1. Did any of the survey results surprise you?

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2. Were there big differences between the two groups? Explain potential reasons for the differences.

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3. Calculate the mean, median, mode, and range for both groups.

Data Set	Mean	Median	Mode	Range
1)				
2)				

## Creating a Double Bar Graph

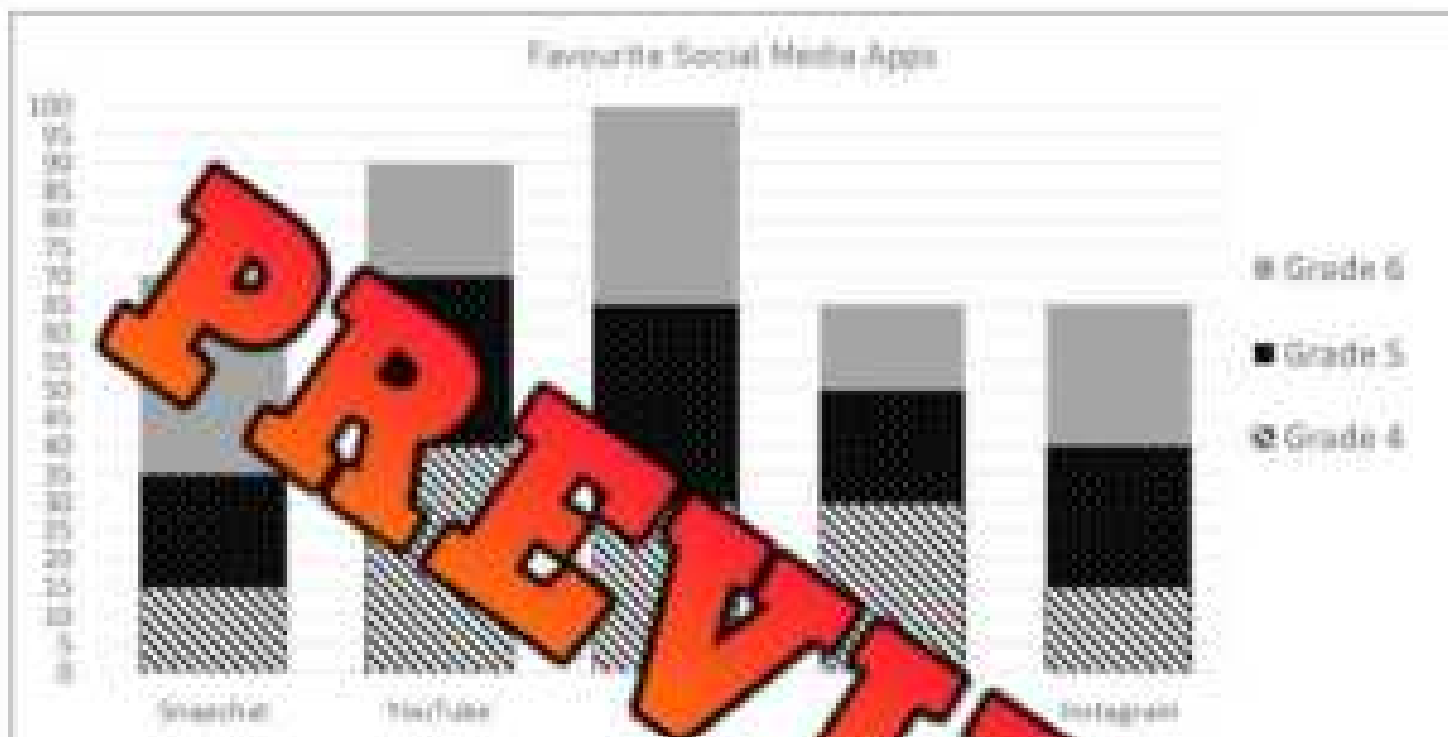
Use the data you collected to plot your graph. Remember the following labels:

- X axis label  Y axis label  Title  Scale  Options  Legend



## Stacked-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 stacked-bar graph below.



### Part 1

Fill in the frequency table by reading the stacked-bar graph above.

Grades	Snapchat	YouTube	Tik Tok	Instagram
4				
5				
6				

### Part 2

Answer the questions below.

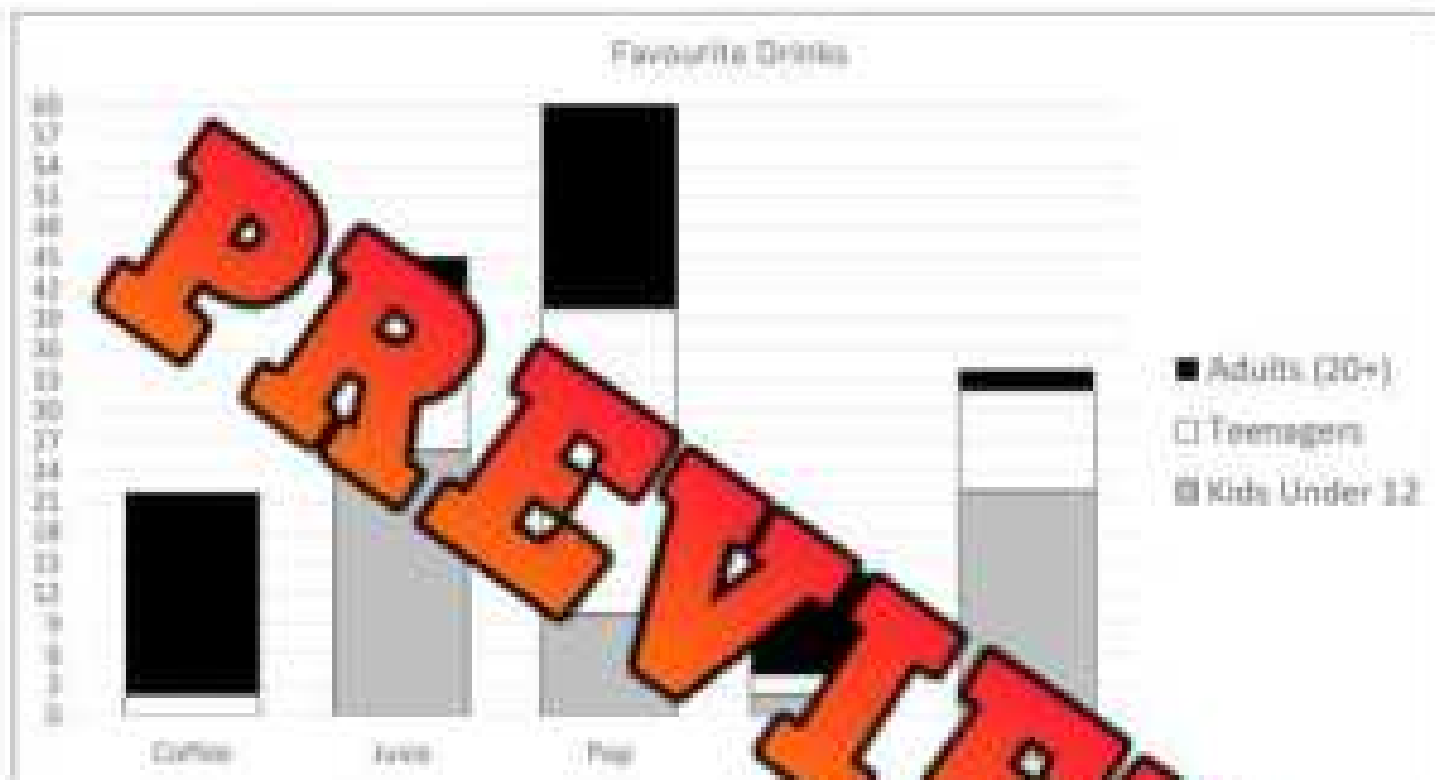
a) How many students in each grade were surveyed?

b) Which social media was the most popular? How many votes did it get?

c) Write 2 things you found interesting or surprising from the data.

## Stacked-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.



### Part 1

Fill in the frequency table by reading the key and graph.

Age Group	Coffee	Juice	Pop	Tea and Milk
12 and Under				
Teenagers				
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 type of sample was chosen? (random, stratified, or systematic)	

## Survey – Creating a Stacked-Bar Graph

### Assignment

Creating a stacked-bar graph using data you have collected

1. Choose a population that you can segment into 2 or more groups.

**Example - Grade 5 and Grade 6 students**

Groups within Population: \_\_\_\_\_

2. Choose a survey question you would like to learn more about. Think about how the answers of the different based on your different groups.

Group 1	Group 2						
Tally	Tally						

### Interpreting Your Survey Results

1. How many people did you survey? \_\_\_\_\_ 

2. Which category was the most popular? \_\_\_\_\_

3. What did you learn about the different groups in your population? Did the results surprise you? Explain.

\_\_\_\_\_

\_\_\_\_\_

4. What is the range of your data? Lowest number: \_\_\_\_\_ Highest Number: \_\_\_\_\_ Range: \_\_\_\_\_

5. If your graph has ten lines on the y axis (up and down), what scale will you go up by?

\_\_\_\_\_

6. Which type of sampling did you choose? \_\_\_\_\_

## Creating a Stacked-Bar Graph

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

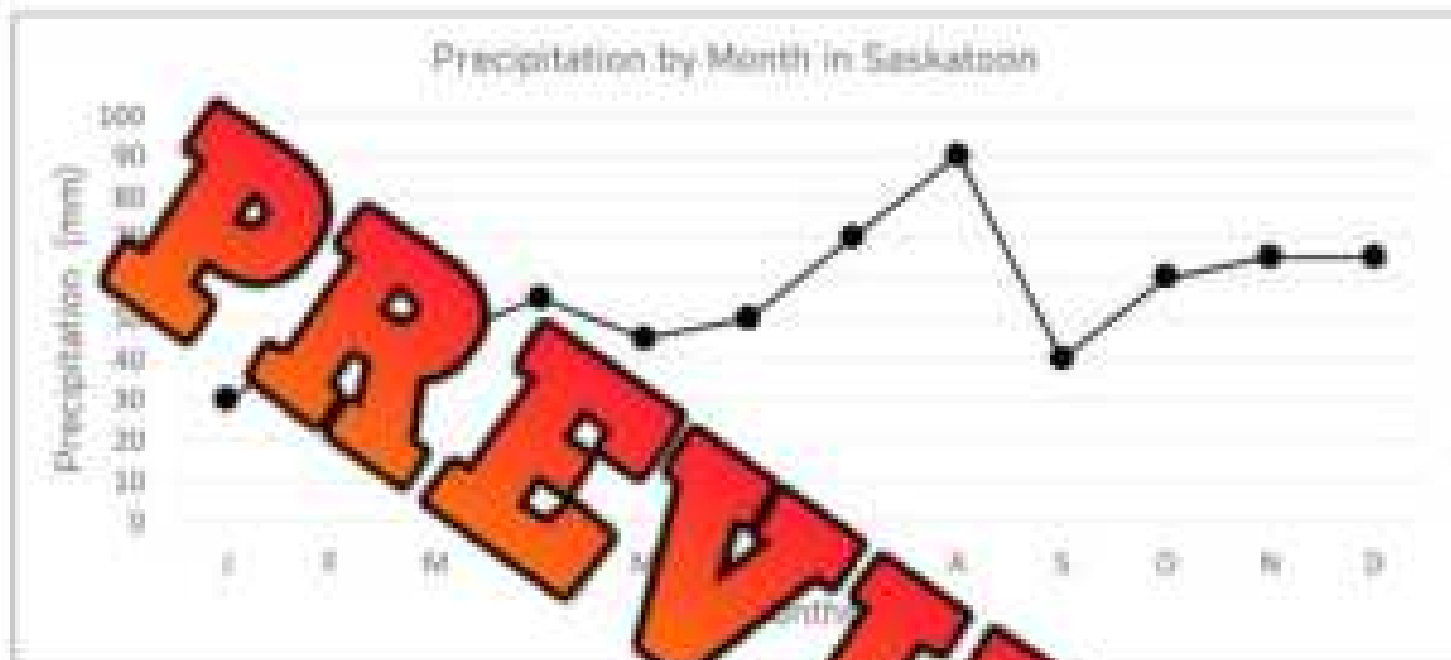
X axis label  Y axis label  Title  Scale  Categories



Fill in the frequency table below with your 5 categories and the 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 Saskatoon for 2021 has been represented in the broken-line graph below. Numbers have been rounded to the nearest 5.



### Part 1

Fill in the frequency table below using the graph.

J	F	M	A	M	J	J	A	S	O	N	D

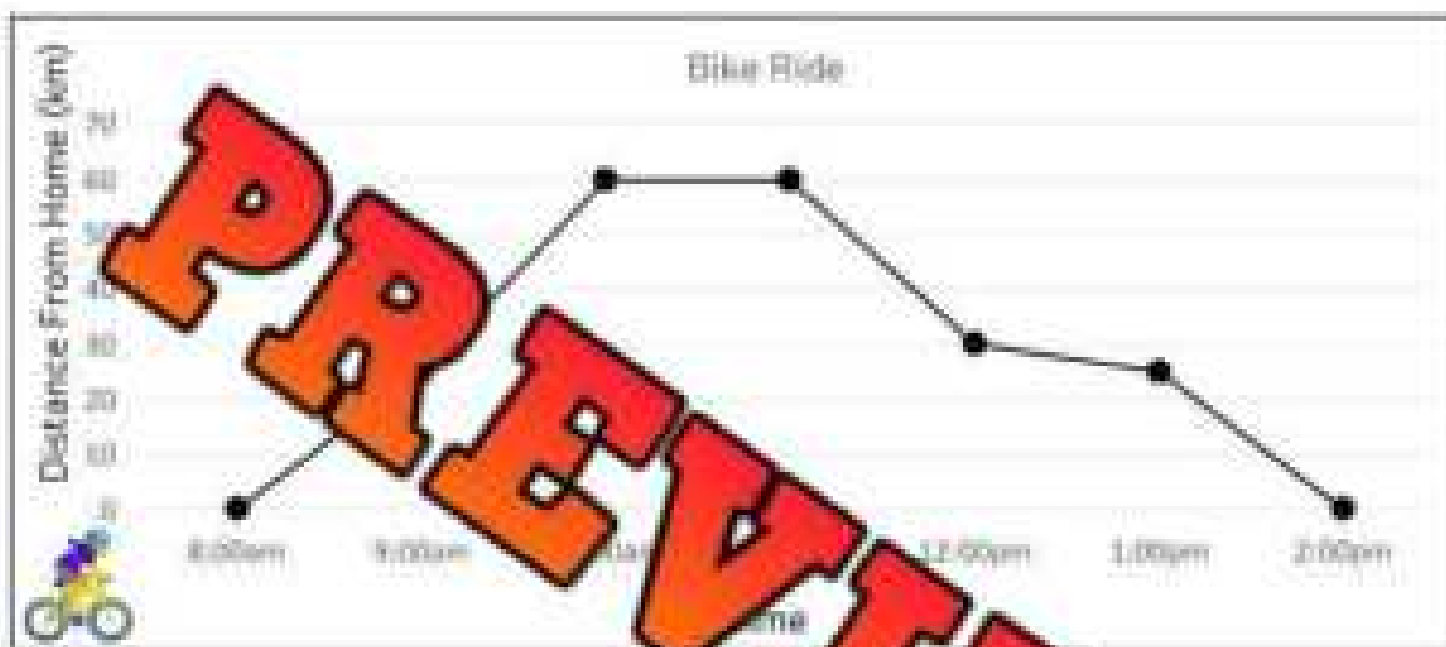
### Part 2

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.



### Part 1

Fill in the frequency table by reading the graph above.

Time				
Distance Travelled (km)				

### Part 2

Answer the questions below.

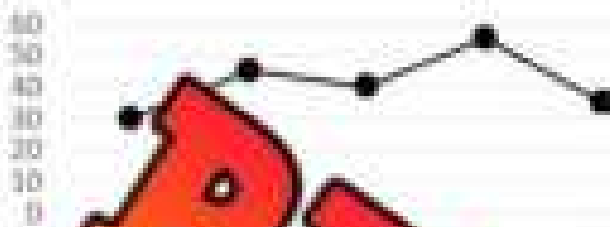
a) How many kilometres in total did Jessica travel?	
b) What time did Jessica stop at the park?	
c) When did Jessica have a flat tire?	
d) What hour did Jessica travel the most kilometres?	
e) On average (mean), how many kilometres did Jessica travel each hour (including the rest hour)?	

# Exit Cards

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

Name: \_\_\_\_\_

Number Of Ice-Cream Cones Sold (Percent %)

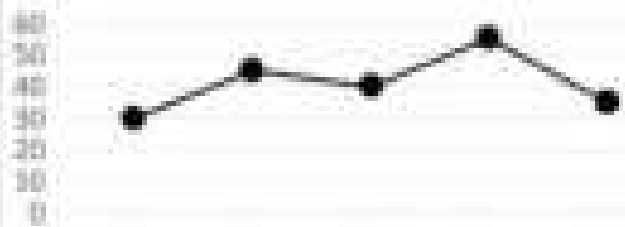


1) On which day were the most ice cream cones sold?

2) How many more ice cream cones were sold on Friday than on Monday?

Name: \_\_\_\_\_

Number Of Ice-Cream Cones Sold (Percent %)

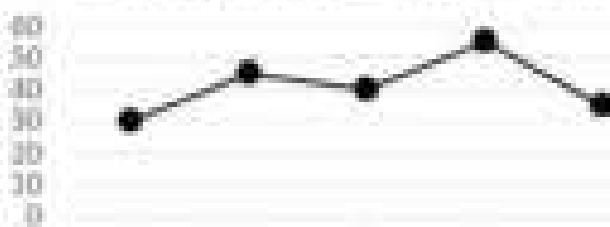


1) On which day were the most ice cream cones sold?

2) How many more ice cream cones were sold on Friday than on Monday?

Name: \_\_\_\_\_

Number Of Ice-Cream Cones Sold (Percent %)



1) On which day were the most ice cream cones sold?

2) How many more ice cream cones were sold on Friday than on Monday?

Name: \_\_\_\_\_

Number Of Ice-Cream Cones Sold (Percent %)



1) On which day were the most ice cream cones sold?

2) How many more ice cream cones were sold on Friday than on Monday?

## Broken Line Graph – Quantitative Continuous Data

Below is a data table showing how much water is collected in a rain barrel each day over a 7-day period.

Water Collected in a Rain Barrel Over 7 Days	
Day	Litres of Water Collected
Monday	0
Tuesday	12
Wednesday	7
Thursday	0
Friday	0
Saturday	0
Sunday	3



### Questions

Read the data and answer the questions.

1) Do you expect the graph to have a steady path or will it go up and down?

2) On which day was the most water collected?

3) Which days showed a drop in rainfall compared to the day before?

4) How many days did it not rain?

5) How many litres did the barrel collect over the 7 days?

6) What label will you use on the x-axis?

7) What scale will you use on the y-axis?

8) What is the average (mean) amount of water collected per day?

## Collecting Quantitative Continuous Data

**Quantitative continuous data** is data that is collected through measuring. We don't use categories, instead we use numbers.



**Example** – height of students, how many steps taken, or time it took to run a lap.

### Data Collection

Collect data by measuring or researching your question of interest

Question

Use the box to organize your data

### Interpreting The Data

- 1) Was your data collected from a primary or secondary source?
- 2) Fill in the table below by calculating the measures of central tendency.

Mean	Median	Range

- 3) What conclusions can you draw from your data? What did you learn?

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- 4) What surprised you about the data you collected? Include at least 1 surprise.

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## Creating a Broken-Line Graph

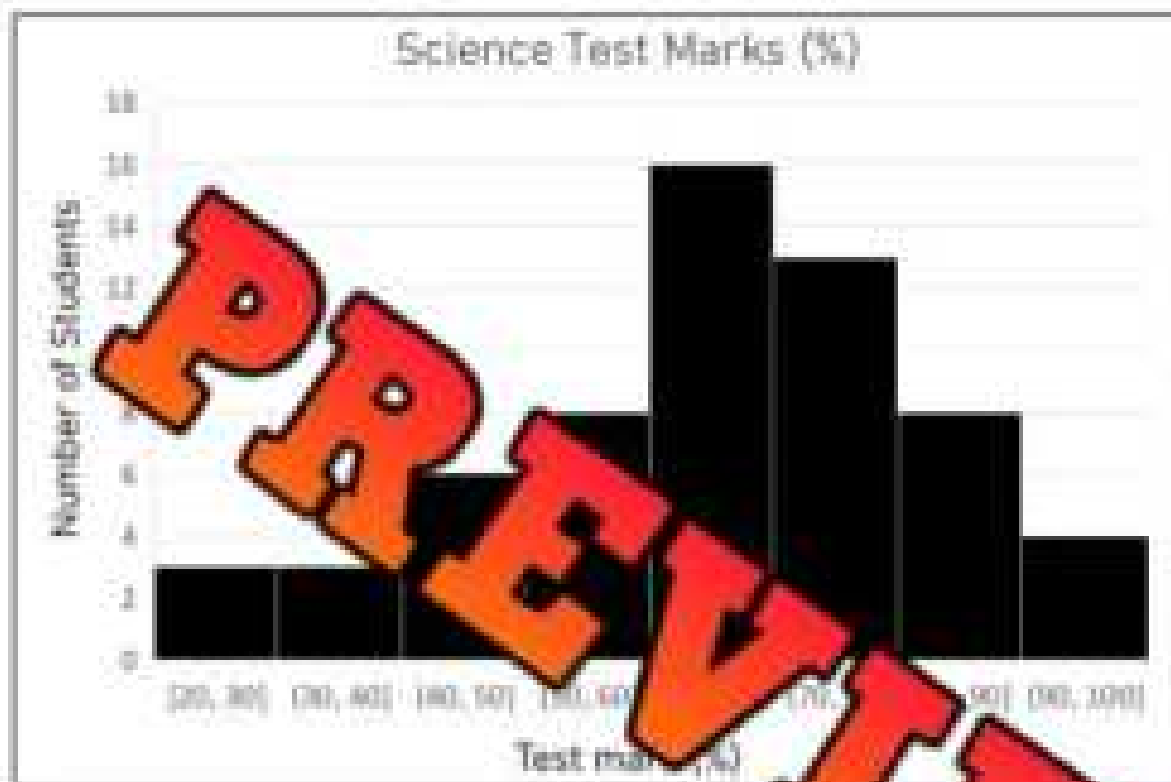
Use the data you collected to plot your graph. Remember the following labels:

X axis label  Y axis label  Title  Scale  Categories



## Interpreting a Histogram

A science teacher posted a histogram of the results of the last test.



### Questions

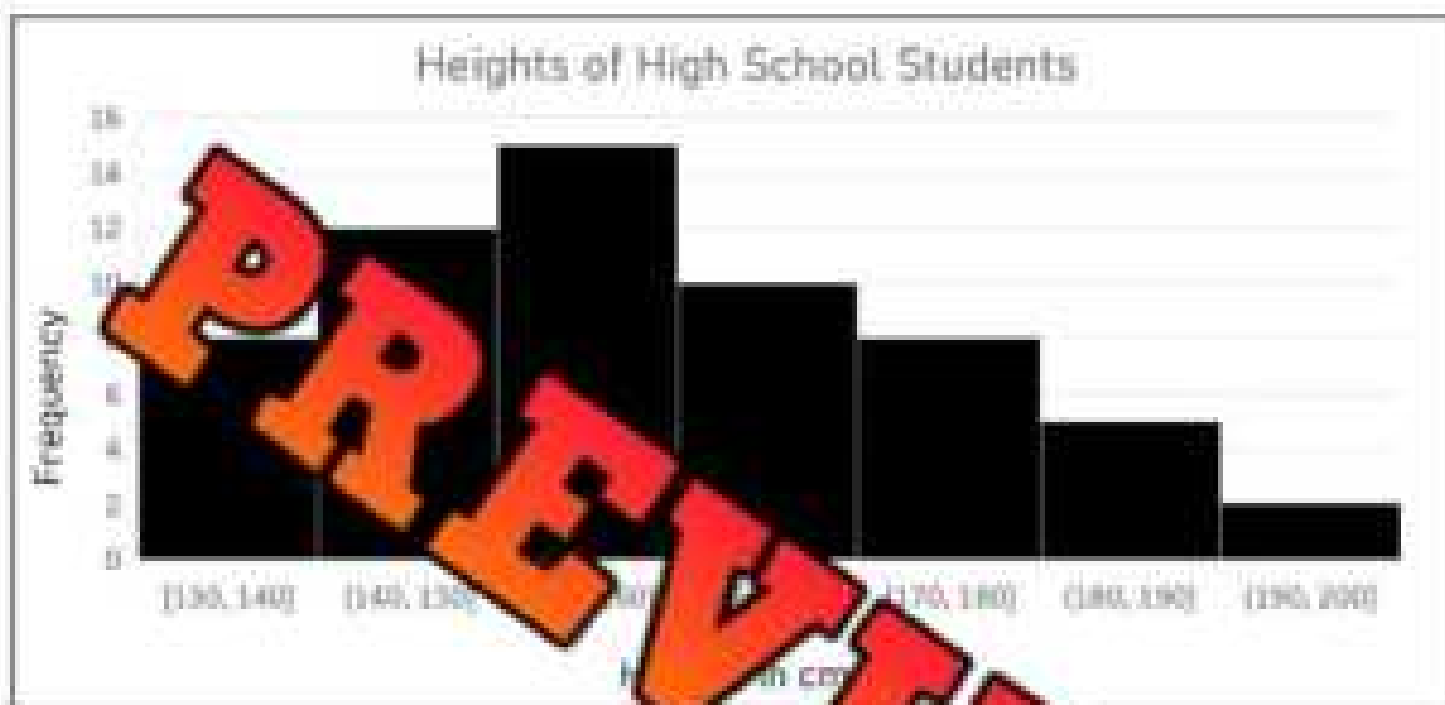
Fill in the tables below

Frequency Table	
0-9	
10-19	
20-29	
30-39	
40-49	
50-59	
60-69	
70-79	
80-89	
90-99	

a) Which test score was most popular?	
b) Did most people pass or fail?	
c) How big are the intervals up to 90?	
d) How many students took the test?	
e) How many students got an A (80%+)?	
f) How many students failed the test (<50%)?	

## Interpreting a Histogram

The heights of 60 high school students at Nationview School were collected and displayed in the histogram below.



Interval	130-140	140-150	150-160	160-170	170-180	180-190	190-200
Frequency							

### Questions

Fill in the tables below

- |   |  |
|---|--|
| a) Which height interval do most students fit?                        |  |
| b) Which height interval is the least common?                         |  |
| c) How many students are taller than 150 cm?                          |  |
| d) What is the combined number of students between 160 cm and 190 cm? |  |
| e) Are more students taller or shorter than 160 cm?                   |  |
| f) What conclusions can you draw from this graph? What did you learn? |  |
| <hr/> <hr/> <hr/>   |  |

## Creating a Histogram

A class of students was asked to track how many total hours they spent on screens over the course of one week. This included time spent on computers, tablets, phones, and watching TV. The goal was to see how much screen time students were using during their regular routines outside of school.

Below is the raw data showing how many hours each student spent on screens each week. Your task is to organize this data into a frequency table using intervals, then create a histogram to show the results.



Raw Data (hours):

7, 14, 22, 31, 4, 18, 19, 3, 47, 39, 22, 6, 12, 33, 28, 44, 10, 23, 36, 11, 8

### Questions

Organize the data into a frequency table and then answer the questions.

Interval				
Frequency				

1) What is the title of your histogram?	
2) What does the X-axis represent?	
3) What is the average (mean) screen time?	
4) How many students are represented in the data?	
5) What is the range of screen time in this class?	
6) Did more students have screen time above or below 25 hours?	
7) Do you think this data would look different during summer break? Why?	<hr/> <hr/> <hr/>

## Creating a Histogram

Use the data from the previous page to plot your graph.  
Remember the following labels:

- X axis label  Y axis label  Title  Scale  Intervals



## Creating Your Own Histogram – Collecting Data

### Data Collection

Collect data by measuring or researching your question of interest

#### Question of Interest

Example: long jump distances in gym class.

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Use the box below to organize your data.

**PREVIEW**

### Questions

Answer the questions.

1) Was your data collected from a primary or secondary source? \_\_\_\_\_

2) What kind of data works best for a histogram? \_\_\_\_\_  
\_\_\_\_\_

3) Why is it common to see taller bars in the middle of a histogram? \_\_\_\_\_  
\_\_\_\_\_

4) What conclusions can you draw from your data? What did you learn?

a) \_\_\_\_\_  
\_\_\_\_\_

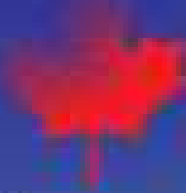
b) \_\_\_\_\_  
\_\_\_\_\_

## Creating a Histogram

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

X axis label  Y axis label  Title  Scale  Number/Intervals





# Canadians in the workforce

2016 C E N S U S

## 42.6 was the median age of workers in 2016\*

### Occupations with lower median age

36.6

Actuaries, statisticians

36.3

Web designers and developers

34.7

Web designers and developers

### Occupations with higher median age

61.6

Judges

53.6

Bus drivers, subway operators and other transit operators

School principals and administrators of elementary and secondary education

**PREVIEW**

## 25 years of gains in women's representation

A rise from 18% to 43% of workers in 2016



\* Excludes those who were not in the workforce

Source: Statistics Canada, 2016 Census of Population

[www150.statcan.gc.ca/n1/pub/92-629-x/2016001/article/14861-eng.htm](http://www150.statcan.gc.ca/n1/pub/92-629-x/2016001/article/14861-eng.htm)



## Reading Infographics

An infographic shares information about a topic in multiple ways. Infographics are great for displaying data that can teach an audience about a topic in an interesting way.

**Directions**

Find 2 different infographics and answer the questions below.

**Infographic # 1**

Title: \_\_\_\_\_

1) What is the topic of the infographic? Why was it made?

2) What did you learn from the infographic? List at least 3 things.

3) What did you like about the infographic?

**Infographic # 2**

Title: \_\_\_\_\_

1) What is the topic of the infographic? Why was it made?

2) What did you learn from the infographic? List at least 3 things.

3) What did you like about the infographic?

**PREVIEW**

## Creating an Infographic

**Directions**

Display the data set in different ways below. Write in the boxes and draw pictures.

The Canadian Government is worried about how much screen time kids are having each week! Check out the results that speak for themselves!

Age	8	9	10	11	12	13	14	15
Screen Time (hours)	3	5	7	8	12	15	19	24



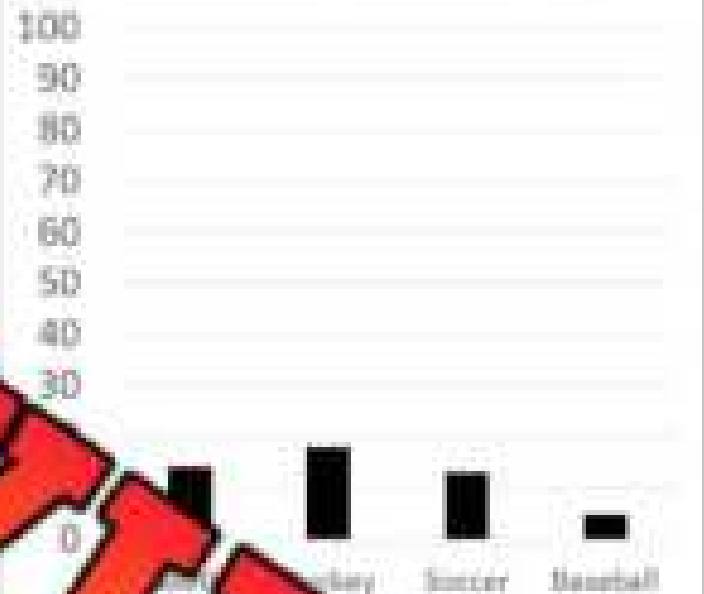

## Examining Scale – Favourite Sport

The two graphs below display the same data. Examine both graphs and answer the questions below.

Favourite Sport – Graph A



Favourite Sport – Graph B



### Questions

What do you notice about the two graphs?

- What is the scale in Graph A?
- What is the scale in Graph B?
- Which graph uses more of the space?
- Which graph is easier to read and interpret? Why is that graph better?
- Why is it important to choose an appropriate scale?

## 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



Book Sales - Graph B



### Questions

What do you notice about the graphs?

a) Which graph would you use to show customers that you 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.

e) Why is it important to read a graph carefully?

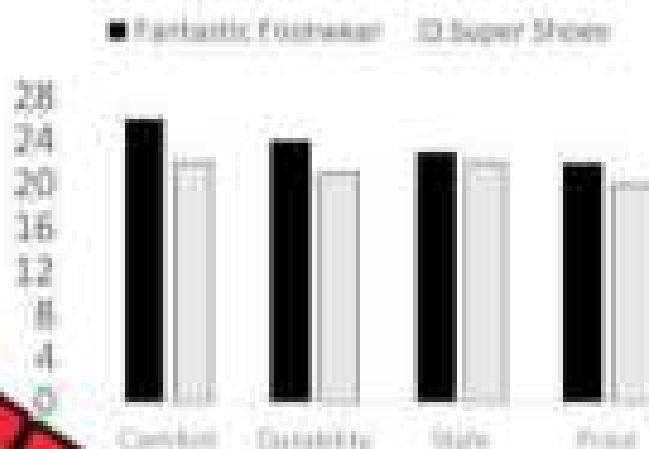
## Misleading Graphs

Fantastic Footwear is running an ad campaign comparing their products versus their competitor, Super Shoes.

Best Shoes - Customer Votes - Graph A



Best Shoes - Customer Votes - Graph B



### Questions

What do you notice about the two graphs?

a) Which graph would you use if you were Fantastic Footwear?

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b) How many more votes in total did Fantastic Footwear get over Super Shoes?

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c) Are Fantastic Footwear shoes a lot better than Super Shoes? Explain.

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d) Why would advertisers use charts like this to sell their products?

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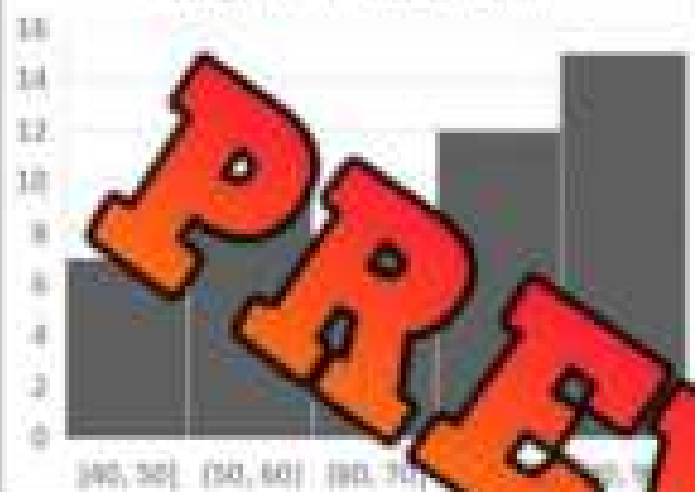


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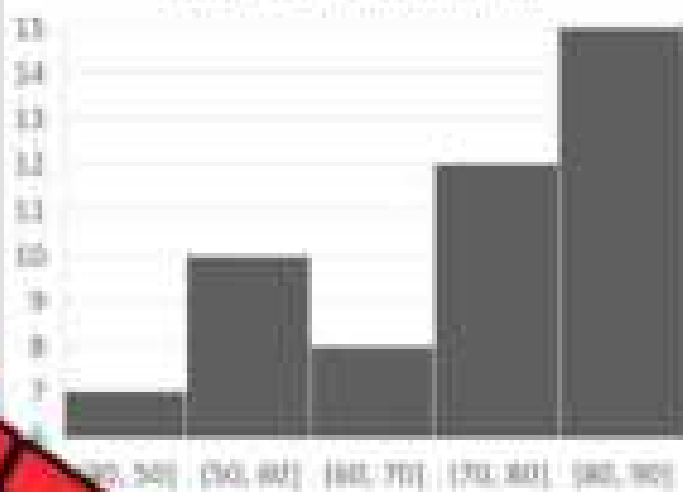
## Misleading Graphs

Wellington High School is proud of how many students they have on their honour roll (80% or more). They want to show off their success by posting their data.

Graph A - Honour Roll



Graph B - Honour Roll



### Questions

What do you notice about the two graphs?

a) Which histogram should Wellington High School use to emphasize their success?

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b) How many more students were on the honour roll? \_\_\_\_\_

c) How many did not make the honour roll? \_\_\_\_\_

d) Would it be fair to use Graph B? Why or why not?

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e) **Make a connection** - Have you ever seen an advertisement use a misleading graph?

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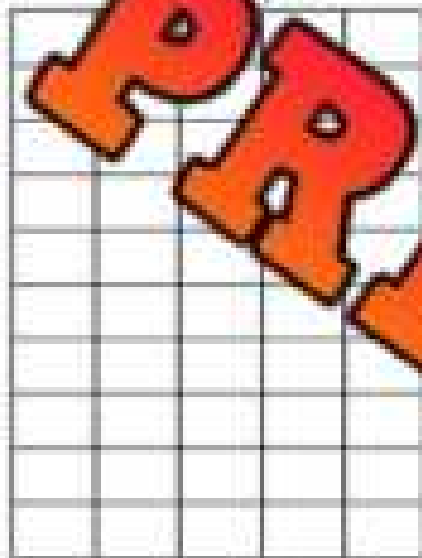
## Misleading Graphs

### Part 1

Draw two graphs - one that is misleading and one that is honest

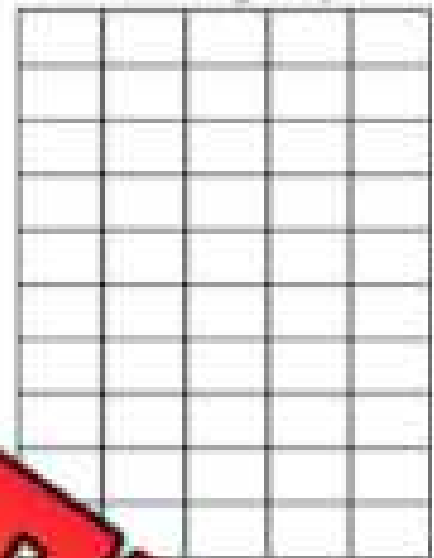
If you were selling cola as a business, how would you graph the data to make it look like your product is much more popular than the other products?

Honest Graph



Favourite Pop	# of votes
Cola	10
Tea	19
Soft Drink	16
Juice	12
Ginger Beer	8

Misleading Graph



### Part 2

What do you notice about the two graphs?

a) Which graph would the cola business use? Explain why.

b) How did you make the graphs different?

## Truth or Lie? Graph Edition

### Objective

What are we learning about?

Students will learn to identify and explain misleading elements in graphs, developing critical thinking skills and understanding how data can be manipulated in visual representations.

### Materials

What you will need for the activity

- A set of 10 different graphs (some accurate, some misleading)
- Smartboard or projector to display the graphs
- Classroom index cards for students to record and view the graphs



### Instructions

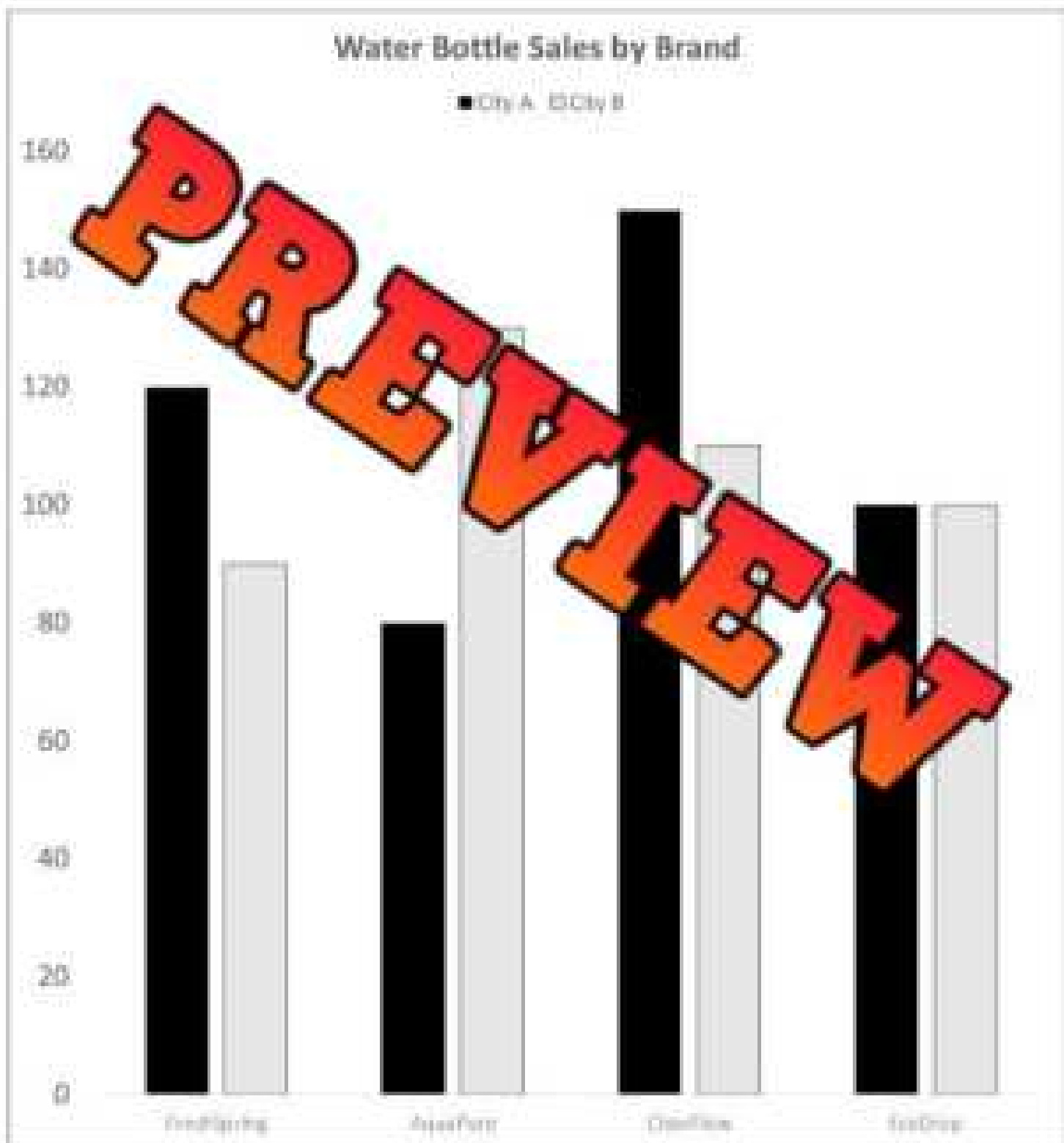
How to complete the activity

1. Begin by explaining the concept of misleading data to the students, highlighting common ways graphs can be manipulated (e.g., using a misleading scale, omitting data, exaggerating differences).
2. Show each graph one at a time on the smartboard or projector to ensure all students can see the graph clearly.
3. After showing each graph, ask the students to use finger cards to indicate their decision. They show one finger if they believe the graph is true and two fingers if they believe the graph is misleading (showing in some way).
4. Once all students have made their decisions, invite a few students or groups to explain their reasoning. Ask them to point out specific elements of the graph that make it true or misleading, such as the use of a misleading scale or omitted data.
5. Facilitate a class discussion to reinforce key concepts, summarizing the points made by the students and providing additional examples if necessary.
6. Repeat steps 3-6 for each graph in the set. Encourage students to look for new elements that might be misleading as they view different graphs.
7. After all graphs have been discussed, ask the students to reflect on what they have learned. Provide them with questions to think about or answer in their math journals or as a group.

Graph

What do you notice about the graph?

A graph comparing the number of water bottles sold from four different brands (FreshSpring, AquaPure, ClearFlow, and EcoDrop) in two cities, City A and City B.

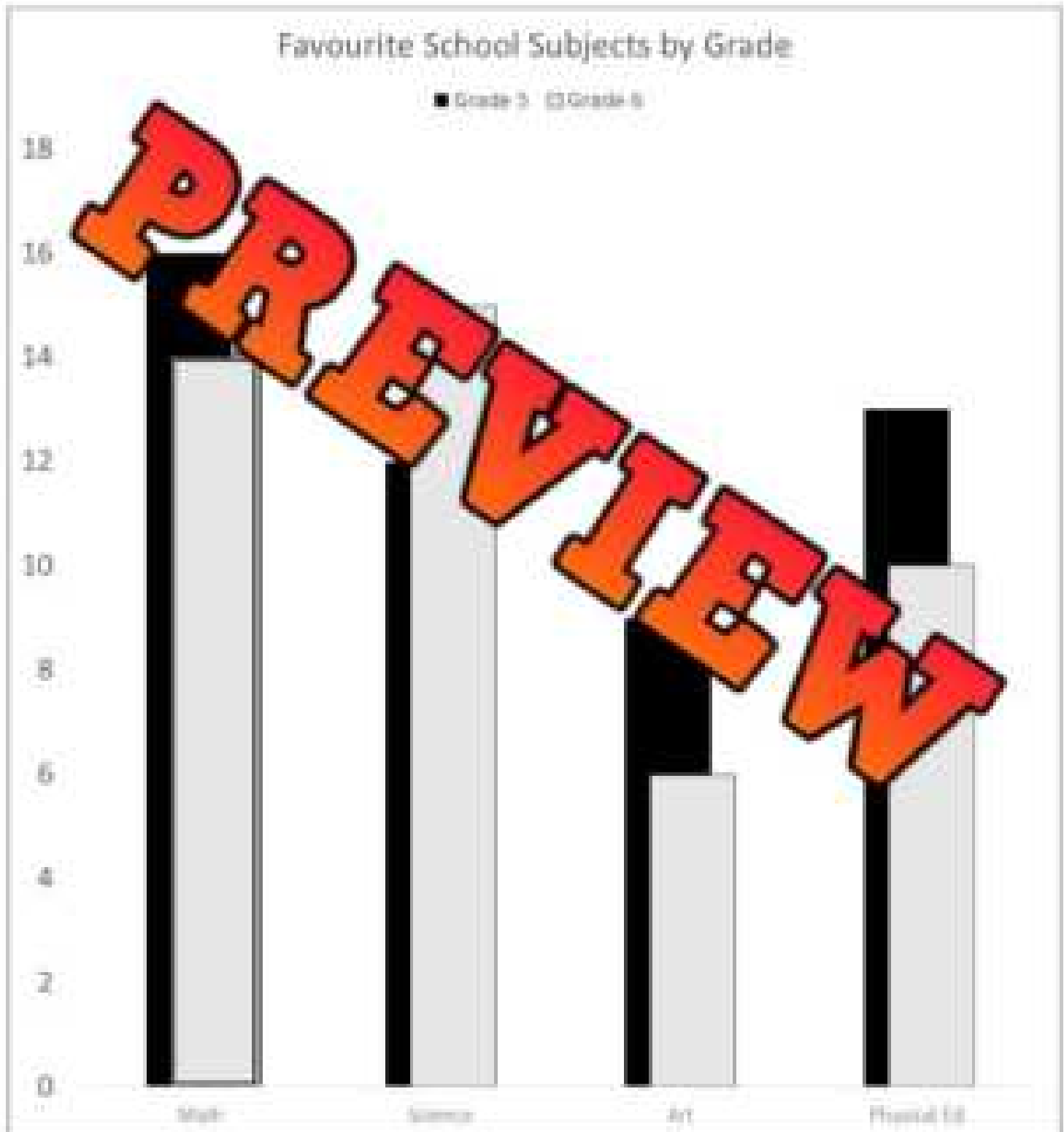


**PREVIEW**

## Graph

What do you notice about the graph?

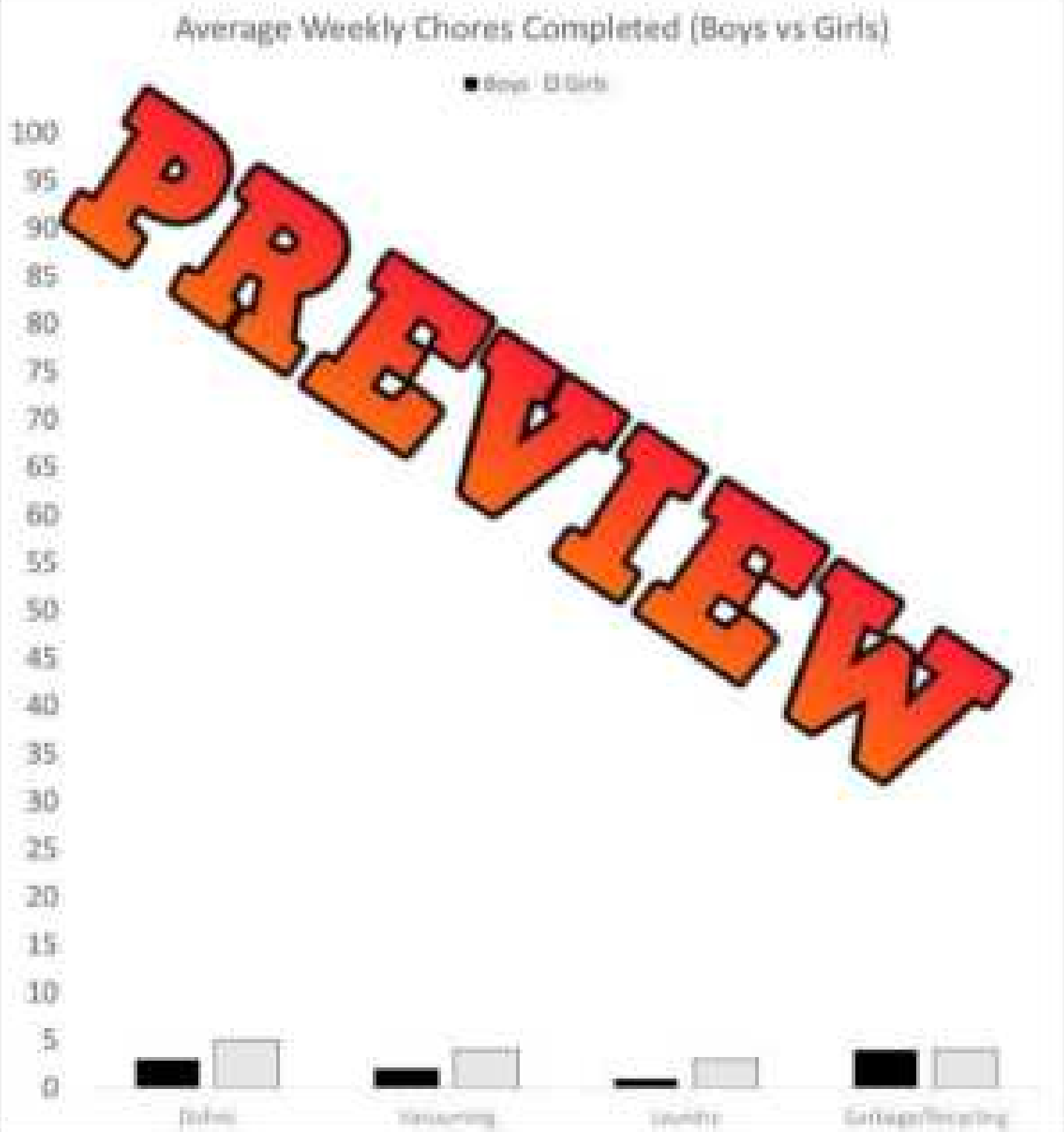
A graph comparing the number of Grade 5 and Grade 6 students who chose each subject as their favourite in a classroom survey.



## Graph

What do you notice about the graph?

A graph comparing the average number of times per week that boys and girls completed different household chores.



**Graph**

What do you notice about the graph?

A graph showing the average number of hours students in different age groups spend on screens during weekdays and weekends.

Age Group	Weekdays	Weekends
Ages 8-10	2.5	2.5
Ages 11-13	3.5	5.5
Ages 14-15	4.5	6.0



Graph

What do you notice about the graph?

How many hours students sleep on a typical school night.

Hours of Sleep (per night)



Graph

What do you notice about the graph?

How many texts students sent in a single day

Number of Text Messages Sent in One Day



**PREVIEW**

Graph

What do you notice about the graph?

A graph showing how the daily high temperature changed over a week in early spring.

### Temperature Over a Week

Temperature (°F)



## Graph

What do you notice about the graph?

A graph comparing how many cups of water two students (Ava and Liam) drank each day over the course of a week.

Daily Water Intake (in Cups) Over a Week –  
Two Students



## 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.

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2) You surveyed the teachers and students at your school asking them which food was their favourite. The results are listed below.

	Pizza	Pasta	Chicken	Steak	Hot Dogs
Students	22	17	14	10	25
Teachers	16	21	18	12	2

Which type of graph would you use to represent the data? Explain your choice.

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3) You are displaying the heights (cm) of students in your school. You want to use intervals to display the data.

<130	130-140	140-150	150-160	160-170	170+
26	44	72	81	53	31

Which type of graph would you use to represent the data? Explain your choice.

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## Unit Quiz – Data Literacy

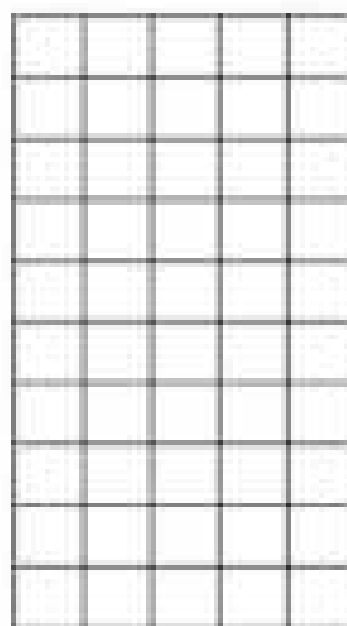
**Part 1** Read the description of the data and circle if it is quantitative or qualitative

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** Read the description of the data and circle if it is discrete or continuous

1) Temperature over a long time period	Discrete	Continuous
2) How many siblings a family has	Discrete	Continuous
3) How tall a tree grows over a year	Discrete	Continuous

**Part 3** Draw the bars for each of the bar graphs below. Calculate the averages



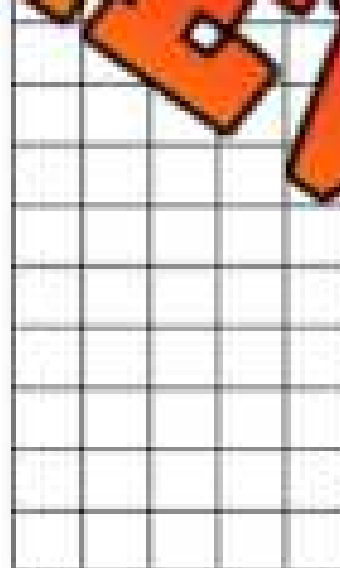
Favourite Food	# of votes
Pizza	27
Chocolate	15
Spaghetti	12
Ice Cream	15
Chicken Wings	21

Pizza  
Chocolate  
Spaghetti  
Ice Cream  
Chicken wings

Mode = \_\_\_\_\_

Median = \_\_\_\_\_

Mean = \_\_\_\_\_



Player	# of points
John	70
Nathan	60
Courtney	30
Ashley	70
Luke	90

John  
Nathan  
Courtney  
Ashley  
Luke

Mode = \_\_\_\_\_

Median = \_\_\_\_\_

Mean = \_\_\_\_\_

## Part 4

Read the graph and answer the questions below

Customers at the dollar-store were asked their age. The results are displayed below in the histogram.



Answer the following questions about the histogram above.

1. Fill in the frequency table

Age Interval	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency							

2. How many customers were surveyed? \_\_\_\_\_
3. What is the scale of the graph? \_\_\_\_\_
4. Which age category is largest? \_\_\_\_\_ smallest? \_\_\_\_\_
5. How many more people in their 40s shopped than people in their 30s? \_\_\_\_\_
6. What are 3 conclusions you can make from the histogram?

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## Part 5

Graph the data below in a broken-line graph

The data for the amount of snowfall in Edmonton 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



Calculate the averages below

Averages	Answer
Mean	
Median	

- Which month had the most snowfall? \_\_\_\_\_
- Which month had the least snowfall? \_\_\_\_\_
- How much did it snow in total during these 7 months? \_\_\_\_\_
- Is this data discrete or continuous? \_\_\_\_\_
- What conclusions can you make from this data? List at least 2.  
\_\_\_\_\_  
\_\_\_\_\_

## Grade 6 D2. Probability

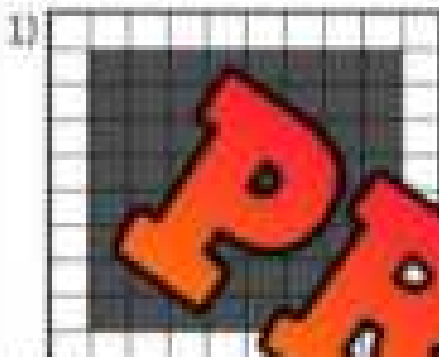
	Curriculum Expectations	Pages That Cover the Expectations
<b>D2.1</b>	use fractions, decimals, and percents to express the probability of events happening, represent this probability on a probability line, and use it to make predictions and informed decisions	105 - 121
<b>D2.2</b>	determine and compare the theoretical and experimental probabilities of two independent events happening	122 - 136

## Finding Probability Using Fractions, Decimals, and Percents

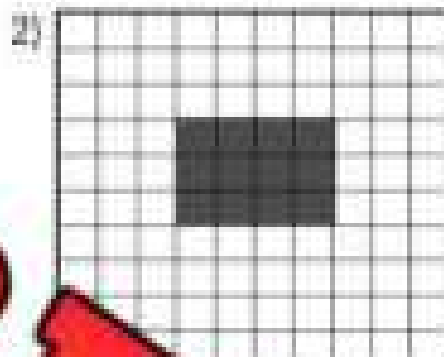
Imagine throwing a dart blindly at a wall with a target on it. The probability of hitting the target depends on the size of the target compared to the wall. Complete the questions below using the shaded area as the target and the wall as the entire grid.

### Questions

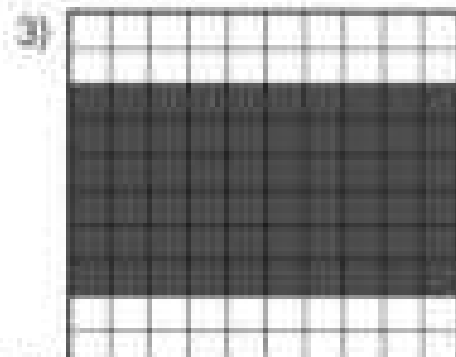
Represent the probability of hitting the target using a fraction, decimal, and percent.



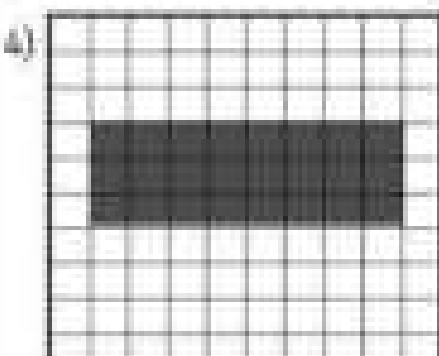
Fraction	Decimal	Percent



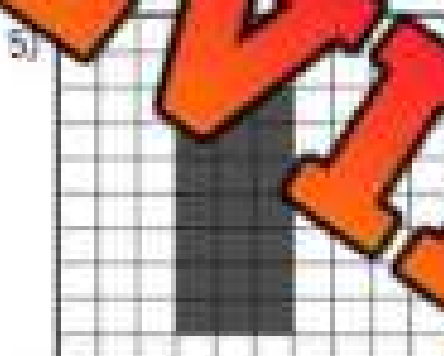
Fraction	Decimal	Percent



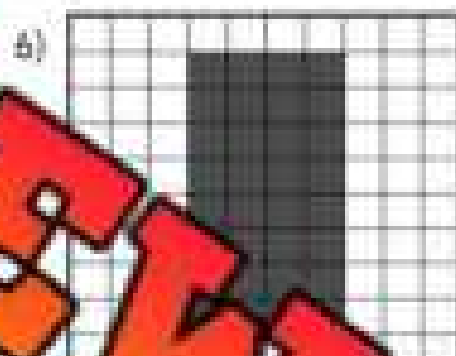
Fraction	Decimal	Percent



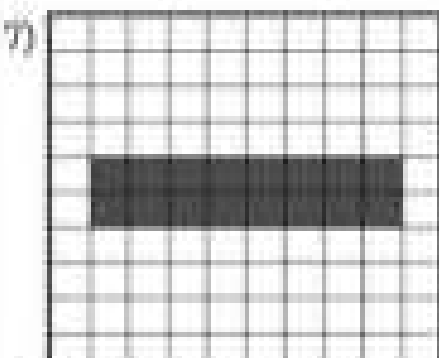
Fraction	Decimal	Percent



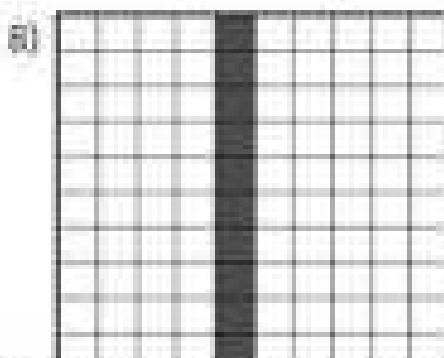
Fraction	Decimal	Percent



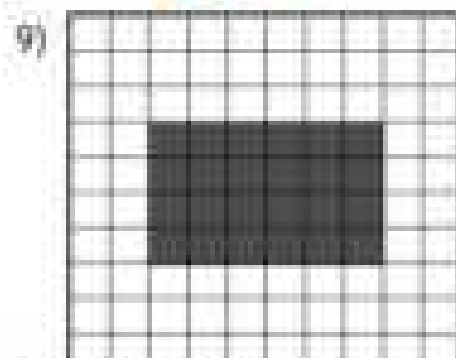
Fraction	Decimal	Percent



Fraction	Decimal	Percent



Fraction	Decimal	Percent


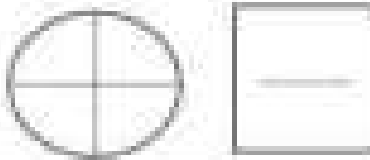
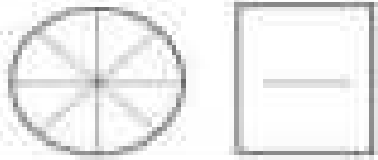


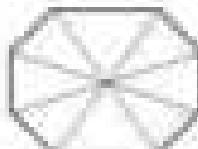


Fraction	Decimal	Percent

## Probability – Finding Halves

### Part 1

Shade in half of the shapes. Write the fraction of shaded shapes to total shapes.

a) 	b) 	c) 
d) 	e) 	f) 

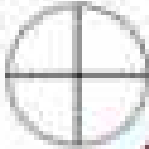

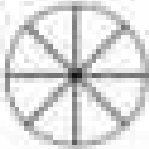

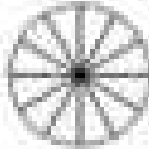



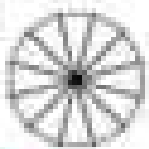

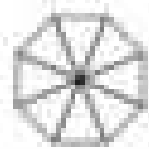

### Part 2

What is half of the number? Write the fraction.

	Number	Half	Fraction	Percent
1	20	10	$\frac{10}{20}$	50%
2	16			
3	22			
4	38			
5	56			
6	36			
7	84			

## 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 one quarter of the shapes. Write the fraction of shaded in shapes.

a) 		c) 	
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**Part 3** Fill in the tables below

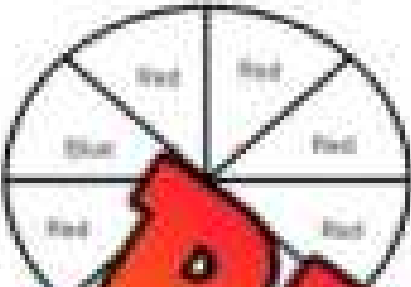
	#	One Quarter	Fraction
1	20	5	$\frac{5}{20}$
2	60		
3	60		
4	24		
5	48		
6	68		
7	96		

	#	One Quarter	Fraction
1	60	15	$\frac{15}{60}$
2	40		
3	72		
4	16		
5	44		
6	84		
7	92		

## Theoretical Probability - Spinner

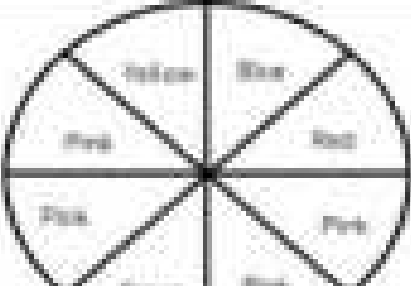
**Directions**

Read the spinner and represent the probability using a fraction/decimal/percent

		<b>Fraction</b>	<b>Decimal</b>	<b>Percent</b>
	a) Spinning a red	_____		
	b) Spinning a blue	_____		
	c) Spinning a blue or red	_____		

		<b>Fraction</b>	<b>Decimal</b>	<b>Percent</b>
	a) Spinning a red	_____		
	b) Spinning a blue	_____		
	c) Spinning a yellow	_____		

		<b>Fraction</b>	<b>Decimal</b>	<b>Percent</b>
	a) Spinning a green or blue	_____		
	b) Spinning a yellow	_____		
	c) Spinning a yellow, green or blue	_____		

		<b>Fraction</b>	<b>Decimal</b>	<b>Percent</b>
	a) Spinning a blue or green	_____		
	b) Spinning a blue or yellow	_____		
	c) Spinning a pink	_____		

# Theoretical Probability – Rolling a Dice

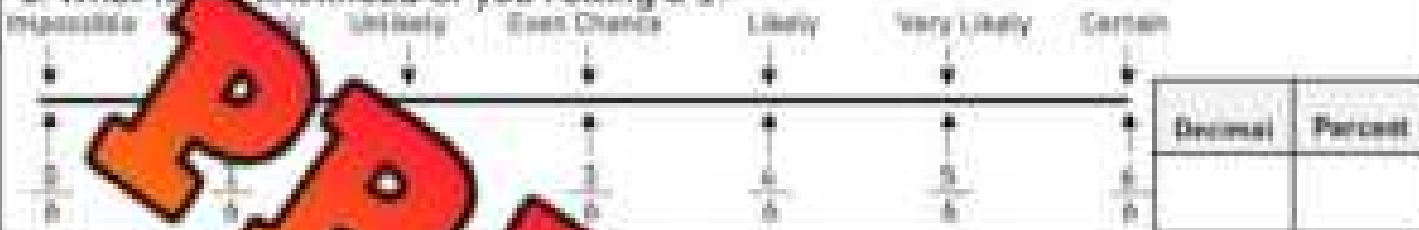
**Rolling a Dice:** A dice has 6 sides. Each side has a number of dots between 1 and 6. When you roll a dice, you have an unlikely chance of rolling a certain number.



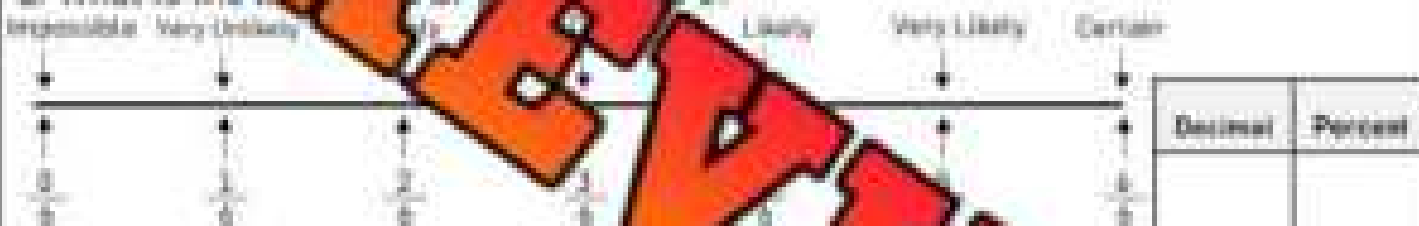
## Questions

Circle the fraction that represents the probability of the event

1. What is the likelihood of you rolling a 1?



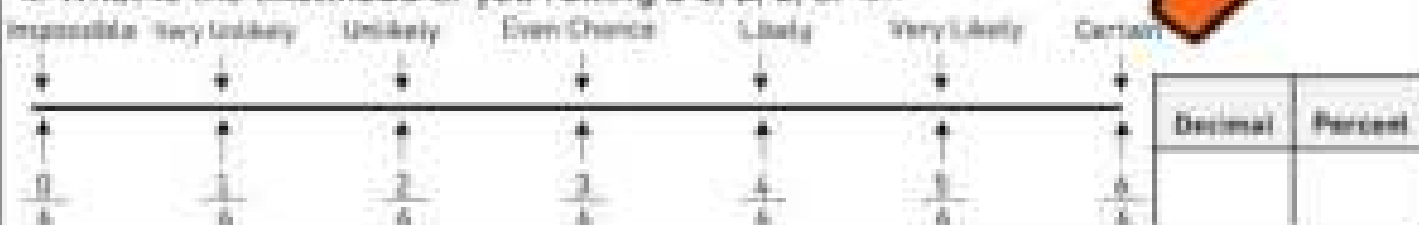
2. What is the likelihood of you rolling a 5?



3. What is the likelihood of you rolling a 1, 2, or 3?



4. What is the likelihood of you rolling a 1, 2, 3, or 4?



5. What is the likelihood of you rolling an odd number?



## Describing the Likelihood of Events – Probability Line

### Questions

Circle the probability of each event happening on the probability line and then write the fraction, decimal, and percent.

1) It has rained 13 out of the last 50 days. What is the probability it will rain tomorrow?

Impossible      Unlikely      Even Chance      Likely      Certain



Fraction	Decimal	Percent

2) Steve made 13 out of 25 shots. What is the probability he will make his next shot?

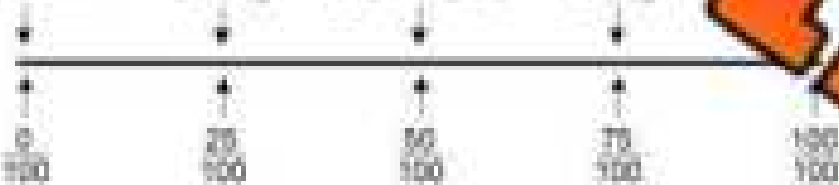
Impossible      Unlikely      Even Chance      Likely      Certain



Fraction	Decimal	Percent

3) Heather hits 4 out of 10 balls in basketball. What is the probability she will hit the next ball?

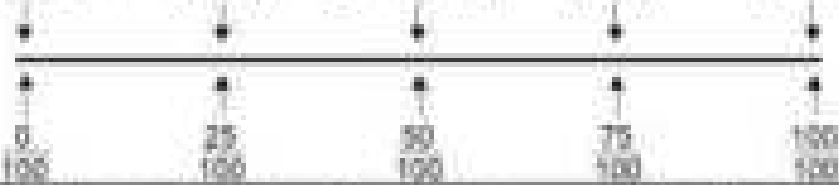
Impossible      Unlikely      Even Chance      Likely      Certain



Fraction	Decimal	Percent

4) Caleb has a 0.421 three-point average. What is the chance he will make his next shot?

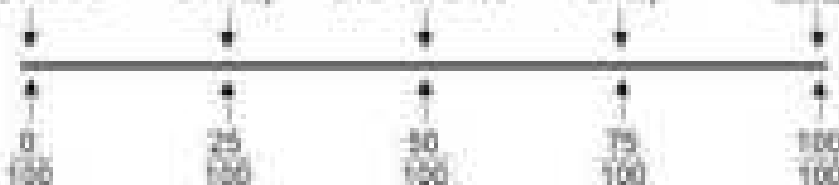
Impossible      Unlikely      Even Chance      Likely      Certain



Fraction	Decimal	Percent

5) In a box of 12 chocolates, 3 are caramel. What is the probability you will get a caramel?

Impossible      Unlikely      Even Chance      Likely      Certain



Fraction	Decimal	Percent

## 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

Colour	Frequency
Red	
Yellow	
Green	
Blue	

Questions

- Describe the probability of pulling out a red gumball as equally likely, likely or certain
- Represent the probability of pulling out a yellow 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 pink 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 red gumball? Probability:		

## 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	
Relative Frequency						
Percentage						

### Questions

### Answers



- Fill in the table above using a fraction, decimal, or percent.
- Estimate the probability that the next car to pass has 1 person in it.
- Estimate the probability that the next car to pass has 3 people in it.
- Estimate the probability that the next car to pass has at least 4 people in it.
- Estimate the probability that the next car to pass has at least 2 people in it.
- 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**

Vladimir Guerrero Jr. had an impressive MLB season in 2021. His number of hits are listed below.

	Singles	Doubles	Triples	Home Runs	Total Hits
Type	115	21	1	51	
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?	

# Sports Statistics

## Questions

### Bo Bichette's 2021 stats



Bo Bichette led the American League in hits in his 2021 season. His number of hits are listed below.

	Singles	Doubles	Triples	Home Runs	Total Hits
Type	121	30	1	29	
Decimal					
Percent					

## Questions

### Answer the questions below.



Question	Points	Percent
1) When Bichette 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) Bichette had 640 at bats last year. What is the probability he will get hit?		
3) What was Bichette's batting average in 2021?		
4) Bichette's teammate Teoscar Hernández had 550 at bats and 163 hits. Who had a better batting average?		

# 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 on the next New Years Day – likely, unlikely, equally likely, or certain.

2) A survey of 20 000 new car buyers found that 1000 buyers had a major mechanical problem in the first year they had their car.

a) What is the probability of...

i) Having a mechanical issue in the first year of ownership

ii) Not having a mechanical issue in the first year of ownership

3) A hockey team played 45 games last year. Their results are below (W = Wins, T = Ties, L = Losses)

W	T	L	W	W	L	W	L	L	W	L	W	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				

## Theoretical vs Experimental Probability

### Theoretical Probability

What should happen

**Example** - The theoretical probability of flipping a heads is 1 time out of 2 or  $\frac{1}{2}$ .

### Experiment Probability

What did happen after the event (experiment)

**Example** - You flipped a coin 10 times and got 7 heads. The experimental probability is  $\frac{7}{10}$ .

### Part 1

Write the theoretical probability of the events happening below

Question	Fraction	Decimal	Percent
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 getting 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: \_\_\_\_\_
- 2) Perform the experiment by flipping a coin 20 times. Record the number of 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.

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# Theoretical vs Experimental Probability

## Examples of Theoretical and Experimental Probability

Theoretical: You should roll a 3 once every 6 rolls =  $\frac{1}{6}$

Experimental: You rolled a 3 twice when you rolled a dice six times =  $\frac{2}{6}$



### Part 1

Circle if the example is theoretical or experimental probability.

Example	Theoretical or Experimental
1) If you roll a die 300 times, you should get a hit 3 out of 6 times.	Theoretical Experimental
2) You flipped a coin 10 times and heads 4 times.	Theoretical Experimental
3) You made 4 out of 10 shots in a basketball game.	Theoretical Experimental
4) You won a 50/50 draw after buying 1 out of 2 tickets.	Theoretical Experimental
5) There is a 40% chance that it will rain today.	Theoretical Experimental
6) You have a 3% chance of pulling out a spade from a deck of cards.	Theoretical Experimental

### Part 2

Is the example theoretical or experimental probability? Fill in the table.

Example	Theoretical or Experimental	Fraction	Decimal	Percent
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 reach into your sock drawer 50 times without looking, what is the theoretical probability of pulling out each of the colours below.

Colour of Sock	White	Yellow	Black	Green	Red
Fraction					

### Part 2

Complete the table for the experimental probability

2) Close your eyes and point to a random spot in the grid below with your eraser. Repeat this for 50 trials and tally your results below.

W	R	B	Y	W	B	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	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  $\frac{2}{2}$ . 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

Event	Theoretical Probability	Fraction
1) Rolling a 1 on a 6-sided die		
2) Rolling a 3 on a 6-sided die		
3) Rolling a 2 or a 5 on a 6-sided die		
4) Rolling a 6 on a 6-sided die		

### Part 2

Follow the instructions below to perform the experiments

1) Roll the dice 6 times. Tally your results.

	1	2	3	4	5	6
Tallies						

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 should happen.

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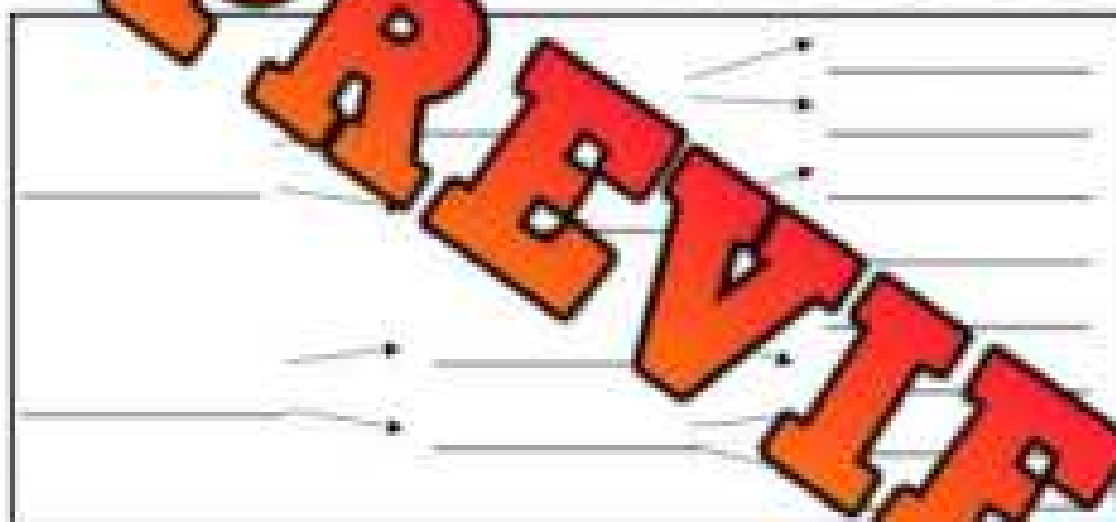
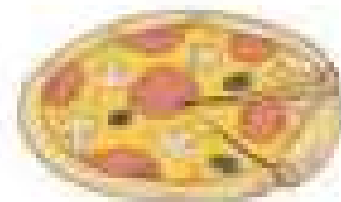
## Theoretical Probability – Tree Diagrams

**Questions** Draw a tree diagram to show how many different combinations you could have

A pizza shop sells regular and gluten-free crust pizza. They have 2 types of cheese and 2 types of toppings. When you order, you can only get 1 type of cheese and 1 type of topping on your pizza. Check out their menu and draw a tree diagram to show the combinations of pizza.

### Menu

- Thin crust (THIN)
- Thick crust (THICK)
- Mozza cheese (MC)
- Cheddar cheese (CC)
- Pepperoni (P)
- Mushrooms (M)



Combinations

1) How many combinations of pizza could you have?

What is the probability of a customer ordering a...	Fraction	Decimals	Percent
2) Thin crust with mozza cheese and pepperoni			
3) Thin crust with cheddar cheese and mushrooms			
4) Thick or thin crust with mozza and pepperoni			
5) Thick crust with mozza or cheddar cheese and mushrooms			
6) Thin crust with cheddar or mozza cheese and mushrooms or pepperoni			
7) Thin or thick crust with cheddar or mozza cheese and pepperoni			

## Drawing Tree Diagrams

### Questions

Draw a tree diagram to help you find the probability of different combinations.

A restaurant sells hot dogs, sausages, and cheeseburgers. They also have toppings and sauces. Customers may only choose 1 topping, and 1 sauce for each food. Find the probability a customer orders a specific combination of food, topping, and sauce.

Food	Topping	Sauce
Hot Dog (H)	Onion (O)	Ketchup (K)
Sausage (S)	Pickles (P)	Mustard (M)
Cheeseburger (C)		



PREVIEW

1) How many combinations of food could you have? \_\_\_\_\_

What is the probability of a customer ordering a...

Fraction

Decimal

Percent

2) Hot dog with onion and ketchup

3) Cheeseburger with pickles and mustard

4) Hot dog or sausage with onion and ketchup

5) Hot dog or sausage with onion or pickles and mustard

6) Cheeseburger with onion or pickles and ketchup or mustard

# Exit Cards

Cut Out

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

Name: \_\_\_\_\_

Draw a tree diagram to help you find the probability of different combinations.

A pizza shop lets customers create their own mini pizza by choosing one option from each category: crust, sauce, and topping. They have 2 types of crusts, 2 types of sauces, and 2 types of toppings.

Crusts	Sauces	Toppings
Thin Crust (T)	Tomato (TO)	Pepperoni (P)
Thick Crust (TH)	Alfredo (A)	Mushrooms (M)

Name: \_\_\_\_\_

Draw a tree diagram to help you find the probability of different combinations.

A pizza shop lets customers create their own mini pizza by choosing one option from each category: crust, sauce, and topping. They have 2 types of crusts, 2 types of sauces, and 2 types of toppings.

Crusts	Sauces	Toppings
Thin Crust (T)	Tomato (TO)	Pepperoni (P)
Thick Crust (TH)	Alfredo (A)	Mushrooms (M)

PREVIEW

## Probability of Two Independent Events – Flip/Roll

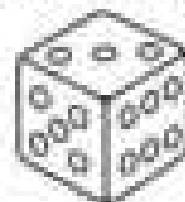
When you complete two activities that do not affect each other, we call them **independent events**. One example is flipping a coin and then rolling a six-sided die. What happens in the coin flip doesn't change what happens with the die — so they're independent!

We can use a tree diagram to show all the possible outcomes. Each first branch shows the result of the coin flip (Heads or Tails). Each second branch shows all the possible outcomes of the die roll (1 to 6) for each coin result.

That means you'll have:

- 2 choices for the coin (H or T)
- 6 choices for the die (1, 2, 3, 4, 5, 6)

So, you'll have 12 possible outcomes.



**Draw**

Draw a tree diagram to show all the possible outcomes.

**PREVIEW**

1) How many possible outcomes are there in total? \_\_\_\_\_

2) Questions	Fraction	Decimal	Percent
a) What is the probability of getting Heads and a 4?			
b) What is the probability of getting Tails and a number greater than 4?			
c) What is the probability of getting a 2, no matter what the coin shows?			
d) What is the probability of getting Tails and an even number?			

## Probability of Two Independent Events – Spinner/Cube

Liam spins a spinner that has four equal sections: red, blue, green, and yellow. Then, he randomly picks one cube from a bag that contains 1 white cube, 1 black cube, and 1 grey cube. After each trial, the spinner is spun again, and the cube is returned to the bag.

Draw

Draw a tree diagram to show all the possible outcomes.



**PREVIEW**

1) How many possible outcomes are there in total?

2) Questions

a) What is the probability of getting blue and then a grey cube?

b) What is the probability of getting red and a cube that is not white?

c) What is the probability of getting any colour and a black cube?

d) What is the probability of getting yellow or green, and the white cube?

e) Is this an example of independent events? How do you know?

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## Experimental Probability of Two Independent Events

### Activity

Complete the experiment below to find the experimental probability

**Question:** What is the experimental probability of getting two heads in a row when flipping a coin?



### Directions:

- 1) Flip the coin twice
- 2) Repeat this process 30 times
- 3) Record the results in the frequency table.

Results	Frequency
HH	
HT	
TT	
TH	

- 1) Fill in the table below to determine the experimental probability as a percent, decimal, and fraction.

Results	Fraction	Decimal	Percent
HH			
HT			
TT			
TH			

- 2) Fill in the table below to determine the theoretical probability of getting two heads in a row below if you completed 30 trials (each trial is flipping a coin twice).

Results	Fraction	Decimal	Percent
HH			
HT			
TT			
TH			

- 3) If you performed this experiment 100 times instead of 30, would you be closer to the theoretical probability? Explain.

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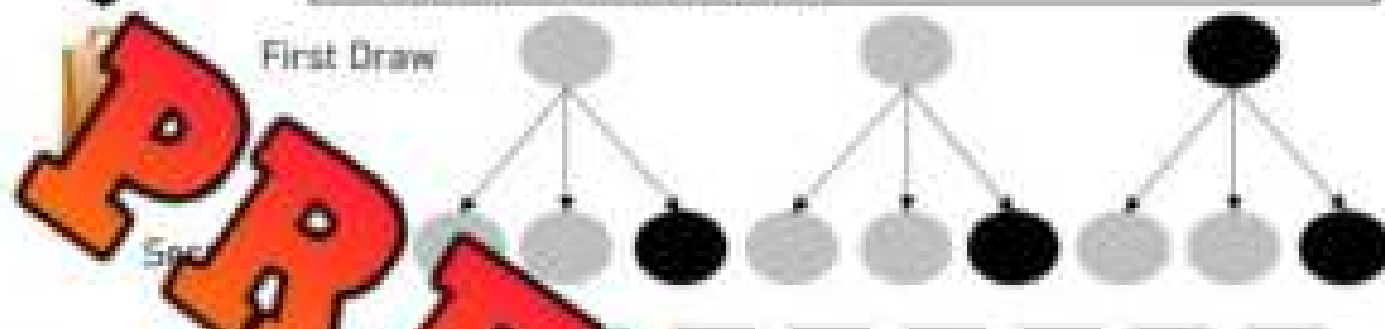
## Probability of Two Independent Events

### Part 1

Theoretical Probability - Answer the questions below



You have three marbles in a bag. There are two grey marbles and one black marble. You draw one marble from the bag and put it back before drawing the second marble. Fill in the combinations below the second draw of marbles.



- How many possible combinations are there for the second draw?
- Use the tree diagram to find the theoretical probability of each combination.

What is the probability of you choosing:

- Two grey marbles
- One grey and one black marble (in any order)
- Two black marbles

	Fraction	Decimal	Percent
a)			
b)			
c)			

### Part 2

Experimental Probability - Answer the questions below

Perform the activity below: Put 2 grey marbles and one black marble in a bag. Choose 2 marbles with two of the marbles being the same colour. Draw one marble and then return it to the bag before drawing again.

Results	Frequency
GG	
GB	
BB	
BG	

1) Was your experimental probability the same as the theoretical probability you figured out above?

2) If you decided to draw the 2 marbles 100 times, would you be closer to the theoretical probability? Explain.

## Unit Quiz - Probability

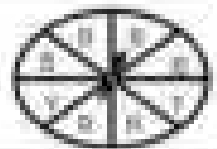
### Part 1

Circle if the example is theoretical or experimental

Example	Theoretical or Experimental
1) You should get a tails 5 out of 10 times when flipping a coin.	Theoretical Experimental
2) You should get 30 three pointers out of 100 because the percentage is 30%.	Theoretical Experimental
3) You should get 10 heads out of 13.	Theoretical Experimental
4) You have a 1/100 chance of getting a 10/50 draw because you have 1 ticket out of 50.	Theoretical Experimental

### Part 2

Read the spinner and circle the most likely scenario.  
Then write the fraction.



1) What is the likelihood of landing on a red part?



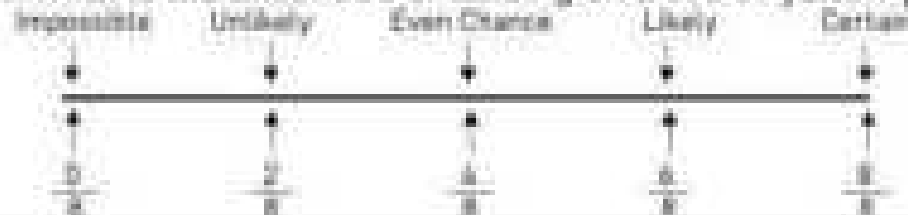
Fraction	Decimal	Percent

2) What is the likelihood of landing on a blue part?



Fraction	Decimal	Percent

3) What is the likelihood of landing on a red or yellow part?



Fraction	Decimal	Percent

## Marbles

There are 24 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

Part 4

1) Describe the probability of pulling out a marble, 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 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:			

**Part 5** Draw a tree diagram to help you find the probability of different combinations

A gym instructor runs a workout class. She always picks 3 different exercises to do one after the other. She switches up the exercises each class. Her options for each exercise are below.

Exercise 1	Exercise 2	Exercise 3
Push-ups (PUSH)	Squats (SQ)	Running (RU)
Pull-ups (PULL)	Lunges (L)	Swimming (SW)
Shoulder Press (SP)		Rowing (RO)

1) Draw a tree diagram below.

PREVIEW

2) How many combinations of exercises could you have?

What is the probability of the instructor choosing...	Fraction	Decimal	Percent
3) Push-ups, squats, and running			
4) Pull-ups, lunges, and rowing			
5) Shoulder press, squats or lunges, and swimming			
6) Push-ups or pull-ups, lunges, and running or swimming			
7) Shoulder press, squats or lunges, and running, swimming, or rowing			



Maya flips a coin two times in a row.

Draw a tree diagram to show all possible outcomes of the two flips.

PREVIEW

1) How many possible outcomes are there in total?

2) Answer the questions below.

	Probability	Percent
a) What is the probability of getting heads both times?		
b) What is the probability of getting one head and one tail?		
c) What is the probability of getting at least one tail?		
d) What is the probability of getting two of the same result?		
e) How do we know this is an example of independent events?		

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# Google Slides Lessons Preview





# Ontario Math Curriculum Financial Literacy – Grade 6

## 3-Part Lesson Format

### Part 1 – Minds On!

- Learning Goals
- Discussion Questions
- Quotes
- And More!

**Forms of Payment**

**Learning Goal**

Students learning to identify and compare different methods of payment, such as cash, debit, credit, and online transfers, to make informed choices that advantage and disadvantage what buying goals and needs as in real-life situations.

**Forms of Payment**

**Learning Goal**

Students learning to identify and compare different methods of payment, such as cash, debit, credit, and online transfers, to make informed choices that advantage and disadvantage what buying goals and needs as in real-life situations.

### Part 2 – Action!

- Writing
- Matching
- Drag and Drop
- Drawing
- And More!

### Part 3 – Consolidation!

- Exit Cards
- Quizzes
- Reflection
- And More!

**Consolidation**

**Exit Card**

Students learning to identify and compare different methods of payment, such as cash, debit, credit, and online transfers, to make informed choices that advantage and disadvantage what buying goals and needs as in real-life situations.



# Ontario Math Curriculum Financial Literacy – Grade 6

### Introduction to Interest

You are 6% interest on your credit card. How much do you owe in total?

Amount Spent	Total Owed with interest
\$1000	
\$2000	
\$3000	
\$4000	
\$5000	
\$6000	
\$7000	

\$1000	\$1060
\$2000	\$2120
\$3000	\$3180
\$4000	\$4240
\$5000	\$5300
\$6000	\$6360
\$7000	\$7420

### Word Problems

1. You have \$1000 in a bank account that earns 6% simple interest per year. How much interest will you earn after 2 years? What will the total amount in the account be after 2 years?

2. You have \$1000 in a bank account that earns 6% simple interest per year. How much interest will you earn after 2 years? What will the total amount in the account be after 2 years?

3. You have \$1000 in a bank account that earns 6% simple interest per year. How much interest will you earn after 2 years? What will the total amount in the account be after 2 years?

### True or False?

- Trading happens and countries get what they need
- Bartering is when people exchange goods or services without using money
- Barter systems get around what the dollar is worth so that it will be
- Trading within a community doesn't affect the economy of that community
- Using money in trade makes it easier to compare the value of goods and services
- You can only trade what you own
- Bartering doesn't involve money so it's not a part of the economy



# Ontario Math Curriculum Financial Literacy – Grade 6

### Donating

Using the bank with the correct money

Item	Amount	Total
100		
50		
20		
10		
5		
2		
1		
0.50		
0.25		
0.10		
0.05		
0.01		

### Use the gross list provided and calculate

Item	Price	Quantity	Total
100			
50			
20			
10			
5			
2			
1			
0.50			
0.25			
0.10			
0.05			
0.01			

100		
50		
20		
10		
5		
2		
1		
0.50		
0.25		
0.10		
0.05		
0.01		



# Workbook Preview



# Grade 6

## F1. Money and Finances

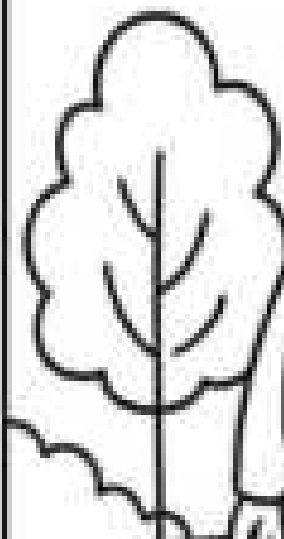
	Curriculum Expectations	Pages That Cover the Expectations
F1.1	describe the advantages and disadvantages of various methods of payment that can be used to purchase goods and services	6 - 18
F1.2	Preview of 65 pages from this product that contains 111 pages total.	
F1.3	identify and describe various factors that may help or interfere with reaching financial goals	29 - 34
F1.4	explain the concept of interest rates, and identify types of interest rates and fees associated with different accounts and loans offered by various banks and other financial institutions	35 - 59
F1.5	describe trading, lending, borrowing, and donating as different ways to distribute financial and other resources among individuals and organizations	60 - 73

NAME: \_\_\_\_\_

# FINANCIAL LITERACY

**PREVIEW**

BANK



## Main Forms of Payment

Methods of Payment	Explanation
<p style="text-align: center;">Cash</p> 	<p>Money in coins or bills. Mostly used to pay for smaller purchases.</p>
<p style="text-align: center;">Check</p> 	<p>A piece of paper that is signed by an individual and given to someone else as payment for something. The individual writes how much money is to be taken out of their bank account and then indicates what money is sent to the bank account of the person who is being paid.</p>
<p style="text-align: center;">Credit Card</p> 	<p>A card that allows you to borrow money. Credit cards allow you to only borrow what the banks think you can afford to pay back. You pay interest on the money you borrowed. If you borrow more money than what you borrowed.</p>
<p style="text-align: center;">Debit Card</p> 	<p>A card that allows you to pay directly from your bank account. When you use your debit card, the money is sent from your bank account to the store's bank account.</p>
<p style="text-align: center;">Gift Card</p> 	<p>A card that can be purchased for a specified cash amount of goods or services from a particular business. For example, a business could sell a \$20 gift card to someone in exchange for \$20 in cash or from another method of payment.</p>
<p style="text-align: center;">Electronic Money Transfer (EMT)</p> 	<p>When we send money electronically. These are often in the form of email money transfers. People use these to send money from their bank account to someone else's bank account.</p>

# Methods of Payment

**Part 1**

Draw a line from the method of payment to the description.

Method of Payment	Description
Cash	Using a card with \$50 on it that has already been purchased from a store.
Check	Paying with a card that links to your bank account.
Debit Card	Paying with coins or bills.
Gift Card	Sending money to a friend using email.
Electronic Money Transfer (EMT)	Handing a piece of paper to someone that shows how much money you want them to take out of your bank account for them to put into their account.
	Using a card to pay for things with borrowed money.

**Part 2**

Which method of payment would you use in each scenario below?

Scenario	Method of Payment
1) You owe your friend \$20 after buying a game from him.	
2) You are buying a chocolate bar that cost \$1.	
3) You want to pay rent from your bank account at the end of the month so you give someone something they can cash later.	
4) You want to buy something for \$50 from your bank account right now.	
5) You want to buy something expensive right now that you will pay for later.	
6) You were given something that you can spend in Sport Chek.	

## Different Forms of Payment

Methods of Payment	Explanation
<b>Electronic Wallets</b> 	<p>An electronic wallet is an app on a device that has a bank account linked to it. When we tap our smart phone or watch to a company's sales machine, the money is taken from our bank account and sent to the company's bank account. You can use debit or credit cards from your electronic wallet.</p>
<b>Wire Transfer</b> 	<p>A wire transfer is when you ask a bank to send your money to another bank in Canada or around the world. Wire transfers are usually used to pay for very expensive things, like a house or a car.</p>
<b>Automatic Deposits</b> 	<p>An automatic deposit is when money is sent to our bank accounts automatically. Most companies use automatic deposits to pay their employees. Automatic deposits are usually made every two weeks.</p>
<b>Automatic Payments</b> 	<p>Automatic payments are when money is sent automatically from our bank account to pay for bills. We can use automatic payments to pay for monthly bills, like our cell phone bill. We can set an automatic payment to these companies to pay for our bills. This helps us avoid late payment fees.</p>
<b>Online Payments</b> 	<p>An online payment is when money is exchanged electronically. Typically, this involves the customer using the business's online payment platform. PayPal is a commonly used platform. When we use PayPal to pay for something online, the business pays PayPal to submit the transaction. PayPal will require customers to link their bank account to their app so they can exchange the money for the business.</p>
<b>Cryptocurrency</b> 	<p>Cryptocurrency is a type of currency that exists only in digital or virtual form. This means there is no physical coins. The currency is secured by a mathematical encryption process that makes it nearly impossible to counterfeit. Bitcoin is one of the earliest and most well-known cryptocurrencies.</p>

Name: \_\_\_\_\_

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## Different Forms of Payment - Questions

### Part 1

Label the method of payment with the description (letter)


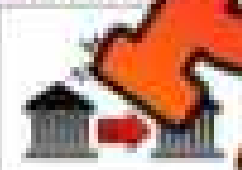


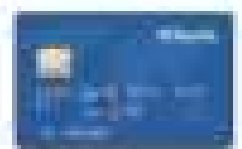

Method of Payment	Description
_____ Electronic Wallets	a) When we pay for something online
_____ Transfers	b) When money is automatically sent to our bank account
_____ Bank Transfers	c) When a bank sends large amounts of money to another bank
_____ Payments	d) A type of or virtual currency that is very secure
_____ Online Payments	e) When you pay for something with your phone or watch
_____ Cryptocurrency	f) When your money is automatically taken from our bank account

### Part 2

Which method of payment would you use in the scenarios below

Scenario	Method of Payment
1) You are paying for a house and need to send \$20,000 from your bank to the seller's bank.	
2) You want to pay for something, but you forgot your wallet. Luckily, you have your bank card on your phone.	
3) You are buying something on a website.	
4) You believe that traditional currency is old technology. You buy Bitcoin and want to use it to pay for a car.	
5) You want to be paid by your employer every other week automatically.	
6) You want to pay your cell phone bill on the first day of every month.	

## Method of Payment – Advantages/Disadvantage

Methods of Payment	Advantages	Disadvantages
<b>Electronic Wallets</b> 	<ul style="list-style-type: none"> <li>- Save time as electronic payments are made quickly</li> <li>- All cards are in one place on a device most people carry around with them.</li> </ul>	<ul style="list-style-type: none"> <li>- Not every business accepts a digital payment</li> <li>- Not all devices have electronic wallets</li> <li>- If device is stolen, your digital wallet could be stolen</li> </ul>
<b>Wire Transfer</b> 	<ul style="list-style-type: none"> <li>- Send large money transfers</li> <li>- Happen fast and usually in real time which means there is no hold</li> </ul>	<ul style="list-style-type: none"> <li>- Sending a transfer costs money in fees to the bank</li> <li>- Once a transfer is made, it is not reversible. Scams can happen when people send transfers to recipients they don't know</li> </ul>
<b>Cash</b> 	<ul style="list-style-type: none"> <li>- Control how much you can spend</li> <li>- No extra fees</li> </ul>	<ul style="list-style-type: none"> <li>- You can lose cash</li> <li>- If cash is stolen, it's gone for good</li> <li>- Transactions take longer</li> <li>- Cash carries germs</li> <li>- Can't pay for online purchases</li> </ul>
<b>Credit Card</b> 	<ul style="list-style-type: none"> <li>- Can afford to buy things you don't have money to pay with now</li> <li>- Build credit that allows you to borrow more money in the future</li> <li>- You can use for online payments</li> <li>- Rewards such as air miles</li> </ul>	<ul style="list-style-type: none"> <li>- Can overspend with money you don't have which can lead to debt</li> <li>- Average rate is 15%</li> <li>- Interest rates are high</li> <li>- Can damage your credit score</li> </ul>
<b>Debit Card</b> 	<ul style="list-style-type: none"> <li>- You can only spend money that you have which leads to less debt</li> <li>- Less or zero fees</li> <li>- Can use for online purchases</li> <li>- Quick payments using tap feature</li> <li>- Allows access to interest-earning bank accounts</li> </ul>	<ul style="list-style-type: none"> <li>- You can run out of money and not be able to buy things you might need</li> <li>- Generally no reward points</li> <li>- Doesn't improve your credit score</li> <li>- Less protection than credit card</li> <li>- Risk of theft</li> </ul>
<b>Electronic Money Transfer (EMT)</b> 	<ul style="list-style-type: none"> <li>- Can pay for things without using debit or credit card</li> <li>- Can send money to anyone with an email address or phone number</li> <li>- Money is sent directly without holds</li> <li>- You can only send money you have which saves you from debt</li> </ul>	<ul style="list-style-type: none"> <li>- You need to have the money available and can't access credit</li> <li>- You could send money to the wrong address</li> <li>- You can't guarantee the recipient</li> <li>- There is a limit on how much you can send using an EMT</li> <li>- High fees for sending transfers</li> </ul>

**Methods of Payment – Advantages/Disadvantages - Questions****Explain**

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

1) Credit Cards	Most Important Advantages/Disadvantages
Advantages	
Disadvantages	
2) Debit Card	Most Important Advantages/Disadvantages
Advantages	
Disadvantages	
3) Cash	Most Important Advantages/Disadvantages
Advantages	
Disadvantages	

**PREVIEW**

# Exit Cards

Cut Out

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

Name: \_\_\_\_\_

Mark

/5

Circle the correct answer.

1) Which payment method might you use at a food truck?	Wire Transfer	Cash
2) Which payment method might not work if your phone dies?	Debit	Digital Wallet
3) Which method lets you pay without using a bank card?	Credit	EMT
4) Which payment type has the highest risk of overspending?	Cash	Credit
5) Which method lets you send large money transfers safely?	Wire Transfer	Debit

Name: \_\_\_\_\_

Circle the correct answer.

1) Which payment method might you use at a food truck?	Wire Transfer	Cash
2) Which payment method might not work if your phone dies?	Debit	Digital Wallet
3) Which method lets you pay without using a bank card?	Credit	EMT
4) Which payment type has the highest risk of overspending?	Cash	Credit
5) Which method lets you send large money transfers safely?	Wire Transfer	Debit

## Methods of Payment Blog Post - Organizer

Write a persuasive blog post that aims to convince the reader to use a method of payment.

In your blog post, consider the following:

- Advantages of the method of payment
- Why the disadvantages aren't a big deal
- Why they should start using this method of payment right away
- Blog posts tend to use a title with a numbered list

For example: "5 Reasons Why Credit Cards Are The Best"

- Use headings in your blog post to keep your information organized



Plan your blog post using the organizer below to prepare for writing your blog post

1) Which method of payment will you choose?

\_\_\_\_\_

2) What will the title of your blog post be?

\_\_\_\_\_

3) Who will your target audience be? (age, gender)

\_\_\_\_\_

4) How will you engage your target audience? (emojis for younger audiences? References to pop culture?)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### Sample Blog Post

#### 3 Ways to Make More Money

##### 1) Work More Hours

It is no doubt that the more you work, the more money you will make.

##### 2) Start a Side-Hustle

If you are having just one job, you may not be making enough. You can find side hustles that are fun to earn money from.

3) Invest  
Put your money to work by investing in quality companies.

Heading Number 1

Idea

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Name: \_\_\_\_\_

## Methods of Payment Blog Post - Organizer

Heading Number 2	
Idea	<hr/> <hr/> <hr/> <hr/>

Heading Number 3	
Idea	<hr/> <hr/> <hr/> <hr/>

Heading Number 4	
Idea	<hr/> <hr/> <hr/> <hr/>

Heading Number 5	
Idea	<hr/> <hr/> <hr/> <hr/>

**PREVIEW**

## Methods of Payment Blog Post




**PREVIEW**

Name: \_\_\_\_\_

## Methods of Payment Blog Post

**PREVIEW**



\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Methods of Payment - Poster - Assignment

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

Consider the following in your poster. (Success Criteria):

- Highlight one important advantage of the payment method.
- Use a slogan or one line to highlight this advantage.
- Use a large title.
- Use less text to keep the poster visually appealing.
- Use graphics and pictures to help explain your message.
- Fill the poster completely and do not waste space.

Plan your poster using the organizer below to prepare for creating your poster.

1) Which method of payment will you choose?

2) What will the title of your poster be?

3) What text will you include on your poster? (Slogan?)

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

Sample Poster

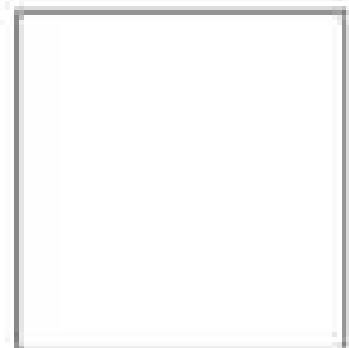
Choose Debit



100



Stay out of the Red,  
Stay away from Credit!



## Methods of Payment Poster

**PREVIEW**

# Financial Goals

Financial goals can be long-term or short-term plans to change spending and/or earning habits. Check out the examples of different spending goals below.



## Short-Term Spending Goals

- Spend less this week to save for pizza on Friday
- Don't buy video games this month to save for a new game



## Long-Term Spending Goals

- Stop buying pop at vending machines to save for college
- Cancel video game subscription to save for hockey registration next year



### Part 1 Short-Term Spending Goals

How much money would you save by changing your spending habits in these examples.

1) Stop buying a \$2.50 pop from vending machines for 1 week	
2) Stop buying \$5 dollar video game add-ons for 1 month (4 weeks)	
3) Stop spending \$15 a week on take-out for 2 months (9 weeks)	
4) Stop buying a \$1.25 chocolate bar each day for a month (30 days)	
5) Stop buying a \$1.75 bag of candy each day for 2 weeks	

What would you do with these savings in the short term? What types of things could you use these savings for?

### Part 2 Long-Term Spending Goals

How much money would you save by changing your spending habits in these examples.

1) Stop paying for a video game subscription for 5 years that costs \$129 each year	
2) Stop buying a \$2.50 pop each day for a year (non-leap year)	
3) Stop buying a \$9.00 lunch twice a week for one year	
4) Stop buying video game add-ons for 5 years that cost \$30 a month	
5) Stop paying for a \$2.25 bag of candy each day for 10 years.	

What would you do with these savings in the long term? What types of things could you use these savings for?

PREVIEW

## Financial Goals

When we want to have more money, we should create financial goals. We can create spending goals or earning goals. **Earning goals** are plans we make to earn more income.

### Short-Term Earning Goals

- Cut my neighbours grass to earn \$500 this summer
- Finish chores to earn \$10 this week
- Sell homemade lemonade to earn \$25



### Long-Term Earning Goals

- Learn how to design websites so I can earn \$10,000 for college
- Learn how to make animated videos to upload to YouTube to make enough money to retire



### Part 1 Short-Term Earnings

How much money would you earn by starting these new earning habits?

- |   |  |
|---|--|
| 1) Selling 5 homemade cookies a day for 20 days.                                  |  |
| 2) Selling 10 cups of lemonade a day for 20 days.                                 |  |
| 3) Cutting the grass for your neighbour for 14 times (14 days) for \$20 each time |  |
| 4) Performing yard work for 4 hours a day for 1 month (30 days) for an hour       |  |
| 5) Selling 5 homemade cookies a day at \$1.50 each for 20 days.                   |  |

What would you do with the extra money in the short term?

### Part 2 Long-Term Earnings

How much money would you earn by starting these new earning habits?

- |   |  |
|---|--|
| 1) Post 100 videos on YouTube where each video earns you \$3 a day. How much would you earn a year? |  |
| 2) Create 30 websites a year for 5 years where you charge a fee of \$200 a website                  |  |
| 3) Sell 90 bags of homemade kettle chips a month for \$8 a bag for 5 years.                         |  |
| 4) Cut your neighbours grass for the next 5 years. 14 times a summer for \$20 each time             |  |

What would you do with the extra money in the long term?

# Exit Cards

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

Name: \_\_\_\_\_

Circle the correct answer. (S-T) represents short term and (L-T) represents long term.

Mark
/5

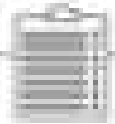
1) You decide to design and sell greeting cards online. You plan to sell them for the next two years while improving your digital art skills.	S-T	L-T
2) You want to buy a new video game in two weeks. To earn money, you start doing chores and dog-walking for neighbours.	S-T	L-T
3) You plan to save money for your first car by working part-time through high school.	S-T	L-T
4) You set a goal to raise \$200 in two weekends by running a bake sale.	S-T	L-T
5) You decide to start a YouTube channel to post weekly videos and earn ad money for college over the next five years.	S-T	L-T

Name: \_\_\_\_\_

Circle the correct answer. (S-T) represents short term and (L-T) represents long term.

1) You decide to design and sell greeting cards online. You plan to sell them for the next two years while improving your digital art skills.		L-T
2) You want to buy a new video game in two weeks. To earn money, you start doing chores and dog-walking for neighbours.	S-T	L-T
3) You plan to save money for your first car by working part-time through high school.	S-T	L-T
4) You set a goal to raise \$200 in two weekends by running a bake sale.	S-T	L-T
5) You decide to start a YouTube channel to post weekly videos and earn ad money for college over the next five years.	S-T	L-T

# My Financial Spending Goals



So you want to have more money? The best way to achieve this goal is to make a plan. Fill in the action plan below to identify your spending goals in the short and long term.

## Part 1

### Short-Term Spending Goals - What can you change today?

1) What is your short-term financial goal? (Example: saving for new shoes, video game, etc.)  
How much do you want to save?

2) What can you stop spending money on to help you achieve your short-term financial goal?

3) Describe the details of you achieving your financial goal. (Example: I am trying to save \$70 for a video game. I will stop spending \$5 on a pop each day. It will take me 35 days to achieve my goal.)

## Part 2

### Long-Term Spending Goals - What can you change with your future?

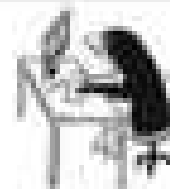
1) What is your long-term financial goal? (Example: saving for college, etc.)  
How much do you want to save?

2) What can you stop spending money on to help you achieve your long-term financial goal?

3) Describe the details of you achieving your financial goal?

**PREVIEW**

## My Financial Earning Goals



The best way to have more money is to earn more money. Fill in the activity below to make a plan to earn more income.

### Part 1

Short-Term Earning Goals – What can you do today to earn more?

1) What is your short-term earning goal? (Example: earn \$100 for new shoes)

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2) What ideas do you have to earn money? List at least 3 things.

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3) Describe the details of achieving your financial goal? What exactly will you do to make money and how much money will you make per item sold?

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### Part 2

Long-Term Spending Goals – What can you do to earn money in the future?

1) What is your long-term earning goal? (Example: saving for \$10,000)

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2) What long-term ideas can you do to earn money in the future? (Example – get a job with a family member or taking lessons online on how to design a phone app)

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3) Describe the details of you achieving your financial goal?

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## Show and Tell – Savings Goal

**Objective** What are we learning about?

Students will demonstrate their understanding of setting and working towards financial goals by sharing a personal savings goal and explaining their plan to achieve it.

**Material** What you will need for the activity:

- Item or drawing representing savings goals (brought from home)
- Paper and pen for personal reflections.



**Instructions** How you will complete the activity:

1. Ask each student to bring an item or a drawing that represents something they are saving for. This could be a toy, a trip, a car, or any item they want to purchase in the future.
2. Each student will take turns presenting their item or drawing. They will explain why they chose this item and how it represents their goal.
3. Students will describe their plan to save money to achieve their goal. This should include:
  - The total amount of money needed.
  - The time frame in which they hope to save the money.
  - The methods they will use to save money (e.g., setting aside allowance, doing chores, saving birthday money).
4. Each student will take turns presenting their item or drawing to the class. They will explain why they chose this item and how it represents their goal.
5. Discuss the importance of setting financial goals and how having a plan can make it easier to achieve these goals.

Reflection

Answer the questions below

1) What item or goal did you share, and why is it important to you?

2) Which goal presented by a classmate did you find most interesting, and why?

3) What different methods did you hear about during the presentations?

4) How can having a savings plan help you achieve your financial goal?

5) In what ways do you think learning about financial planning at a young age will help you as an adult?

**PREVIEW**


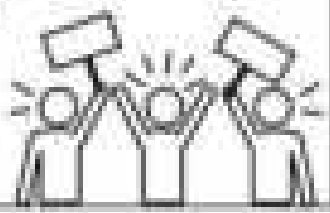
## Negative Factors Affecting Financial Goals

### Financial Goals

Having financial goals is important because it helps us understand why we are saving money and why we are working to earn money. Having a financial goal of saving for college will require someone to control their spending habits and consider their earning methods.

### Factors Affecting Reaching Our Financial Goals

Throughout the journey of achieving our financial goals, it is likely we will face challenges that will make it more difficult. Consider the following factors:

- **Changes in income** due to losing job or having inconsistent earnings. In 2020, the Covid-19 pandemic impacted many businesses negatively and impacted many people's financial goals. In 2020, unemployment in Canada went from 7.9% to 13.1%. This means that 3 million people lost their jobs. It is estimated that 3 million jobs were lost due to the pandemic.
- **Changes in expenses** due to many different situations, like property taxes increasing, interest rates increasing, or a new member to the family. These changes can make it harder to reach your financial goals as you will be spending more money.
- **Changes in priorities** can affect your financial goals. You may want to buy a Lamborghini now, but as you get older, your priorities may change, and you might rather have a nice house or more money saved in the bank. 
- **Changes in health** will affect a person's financial goals. If you are unable to work any longer, which will cause them to have less income, they will have to adjust their financial goals. Dealing with health conditions can increase in expenses, as some medications and medical equipment are expensive.
- **Changes in personal and family situations** affect how much money a household will have. When partners get divorced, this causes a change in how much income the family generates. Financial goals will need to be altered in this situation. Also, an addition of a baby will often create a need for changing financial goals. Grandparents moving in with their children will also affect the family's income and expenses.
- **Changes in social factors** like social inequalities will affect people's ability to earn an income. According to the Canadian Labour Congress, women still make on average 32 percent less than men. For indigenous women, the gap is even higher, at 45 percent less than men. Even worse, immigrant women and women with a disability have a 55 percent and 56 percent wage gap. These numbers have improved over time, but until women are paid equally, these changes will affect a woman's financial goals. 

**Questions**

Use evidence from the text to support your answers

1) How can changes in income affect a person's ability to achieve their financial goals?

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2) How did the Covid 19 pandemic affect people's ability to achieve their financial goals?

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3) Do you think your needs change when you're older? What do you want now that you might not want when you're older? What do you think you might be interested in when you're older?

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**Reflect**

What are your thoughts on the gender wage gap?

1) What is the gender wage gap? How will the wage gap affect people's ability to achieve their financial goals? Is it fair?

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2) Do you think only women face a wage gap? Which other groups might experience a wage gap?

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**PREVIEW**

## Positive Factors Affecting Financial Goals

### Factors Affecting Reaching Our Financial Goals

As our lives change, our financial goals can become easier or harder to reach. In many instances, events in our lives can change our income, saving, and spending situations. Check out the examples below.

- **Changes in income** can occur in many different situations. First, you could receive a promotion at work that increases your income. Second, your investments could go up, causing you to earn more income. You could inherit money or win money as a prize. There are many other ways to increase your income, including getting a second job. 
- **Changes in expenses** can impact your ability to reach your financial goals. You could get a job where you only spend a certain amount on housing, food, and clothing each month. Your expenses could also decrease by paying off a student loan or selling a car that you were paying on. 
- **Changes in priorities** will definitely impact your financial goals. If you prioritize saving as opposed to spending, you will be able to reach your financial goals sooner. If you prioritize spending money on investments in material possessions, you could set yourself up to reach your financial goals sooner.
- **Changes in personal and family situations** can have a positive impact on your financial goals. Becoming a contributing member to a family will increase the income the family brings in. If a single person meets a partner, the household income could double if both partners are employed. 
- **Changes in social factors**, like the gender wage gap could be a positive factor in people reaching their financial goals. From 1998–2018, women's wages went up 20.5%, from an average hourly wage of \$22.34 to \$26.92. In the same time frame, men's hourly wage went up only 12.9%, from \$27.51 to \$31.05. The gap is closing as more and more people support equality in the work force. As time moves forward, the gap will hopefully continue to close, meaning women can achieve their financial goals faster.

**Questions**

Give an example of how each factor could improve your ability to reach your financial goals

Changes in...	Example - "I could get a promotion that increases my income"
Income	
Expenses	
Priorities	
Family Situation	
Social Injustices	

**Reflect**

What are your thoughts on this situation?

1) Give an example of someone you know or have heard of whose financial situation change? For example, a professional hockey player who is in school, but earns millions of dollars in the NHL.

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2) How can you change your priorities to improve your ability to reach your financial goals?

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3) How can sticking to a budget improve your chances of reaching your financial goals?

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## Factors Affecting Financial Goals - Profiles

### Questions

Read the profiles below and anticipate how their financial goals might change.

<p><b>Profile</b></p>	 <p>Dan just started a summer job in June. He works as a landscaper when the weather is nice. He is hoping to save \$4,000 for college next year. There are 12 weeks before school starts, and he usually makes \$500 a week.</p>
<p>Factors that could affect reaching financial goal (expenses, priorities, health, income)</p>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
<p><b>Profile</b></p>	 <p>Michelle has a part-time job where she works at a farm. She is only paid when they need her. She likes to go to the mall to have fun with her friends. She wants to save \$200 for new shoes by the end of the month. She usually makes \$100 a week.</p>
<p>Factors that could affect reaching financial goal (expenses, priorities, health, income)</p>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
<p><b>Profile</b></p>	 <p>Rebecca has been working at a company for 10 years. She hasn't had a raise in pay, but she hopes to get one soon. She earns \$42,000 a year, but wants to earn \$50,000, like some of her colleagues. A short-term goal of hers is to save \$2,000 in the next 3 months for a new car.</p>
<p>Factors that could affect reaching financial goal (expenses, priorities, health, income, social injustices)</p>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

## Reaching Financial Goals

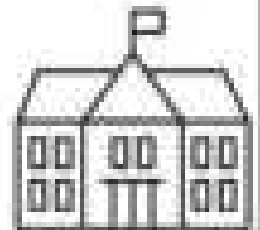
### Questions

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

1) Ellie is trying to save \$7,000 for college next year. She has 12 months to achieve her goal. Here are the details of her year long journey to achieve her financial goal.

- She earns \$900 a month
- She is on a budget, spending \$30 a week
- Her car broke down, and she needs to spend \$2000 to fix it

Did she reach her financial goal of \$7,000?



2) Kevin has a financial goal of saving \$600 for a new gaming system. He wants to buy it on Black Friday when it will be on sale for \$700. Black Friday is in 20 weeks. The details of his plan are as follows:

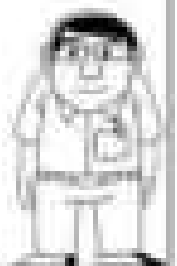
- He cuts two of his neighbor's lawns each week for \$15 each week
- He buys lunch out twice a week for \$5 each time
- After 10 weeks, Kevin decides to go to a concert. The ticket cost \$75

Did he reach his financial goal of \$600 in the 20 weeks?

3) Ryan wants to retire in 10 years. He has calculated that he needs \$500,000 to retire. His journey of retiring is detailed below:

- He earns \$40,000 a year with his current job.
- His family is on a budget where they spend \$1,500 a month
- He decides to get a second job, doing his passion of selling artwork. He earns \$10,000 a year extra
- Ryan has an unexpected health issue, causing him to pay an extra \$500 a month

Did he reach his financial goal?



## Credit and Debt

### What is Credit?

People can apply for credit, which allows them to buy things without paying money for them. When we use credit, we are agreeing that we will pay the amount owed in the future. Banks can offer a line of credit to people so they can pay for things without using money in their bank account. The bank will study the person's finances to determine how much credit that person can have. If the person always pays back the money they owe, they will be given a higher line of credit.

Credit cards are also forms of credit. When we use a credit card, we are not using our own money. We are agreeing that we will pay back the money to the card company. If we don't, we will have to pay even more money to the credit card companies in the form of interest.



### What is Debt?

Debt is the unpaid money we spend money on credit. If we use a line of credit or a credit card, the amount of money we owe is called debt. People can also borrow money from their friends or family. This is also called debt to them. This means they owe them money.

### Part 1

Is the statement true or false? Write your answer.

1) Everyone has the same amount of credit.	True	False
2) People who pay their debt on time have better credit.	True	False
3) When you pay using a credit card, you are using your own money.	True	False
4) Debt is unpaid money that is owed to someone else (bank, credit card company, friend, family).	True	False
5) If you don't pay your credit card on time, you will owe more than you borrowed.	True	False

### Part 2

Answer the question below

What is the difference between debt and credit?

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### Part 3

Provide an example of both credit and debt. Ex - Debt: you borrow \$500 from a friend

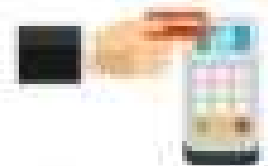
Credit:

Debt:

## Introduction to Interest

### What is Interest?

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



### Interest From Investments

We can earn interest on our investments, which means we are putting our money to work! If we invest \$100 in the stock market, we hope that one hundred dollars is worth more at the end of the year. The average interest rate return in the stock market over the last 100 years is about 10%. This means that after one year, your \$100 is now worth \$110.

### Interest From Borrowing

Most people are required to borrow money to pay for things like cars, houses, or even water. Many household necessities. When we borrow money, we pay the lender (usually a bank) an amount we pay in interest depends on the interest rate. A higher interest rate will mean we have to pay more back in interest. For example, if we borrow \$100 with a 15% yearly interest rate, we will pay \$115 at the end of the year. It is important to shop around for the lowest interest rate.

#### Part 1

A bank pays 5% interest on your savings account – \$5 per \$100

Savings	Savings + Interest	Savings	Savings + Interest
1) \$300	\$15	5) \$700	
2) \$500		6) \$800	
3) \$800		7) \$900	
4) \$1000		8) \$2000	

#### Part 2

You pay 19% interest on your credit card – for every \$100 you pay \$119

Debt	Debt + Interest	Debt	Debt + Interest	Debt	Debt + Interest
1) \$200	\$238	4) \$700		8) \$2300	
2) \$400		5) \$1400		9) \$2500	
3) \$600		7) \$3000		10) \$3180	

#### Part 3

Answer the question below

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

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## Understanding Interest

### What is Interest?

Interest is a fee you pay a bank or financial institution when you borrow money from them. It's like a payment for using their money. For example, if you borrow \$100 (Principal Amount) and the bank charges \$5 as interest, you pay back \$105.

### How Interest Affects Borrowing

Interest makes borrowing more expensive. You pay back the amount you borrowed (Principal Amount) plus interest, so the total cost is higher than the loan amount.

### Understanding Interest Rates

Interest rates show how much you will pay. The rate is usually shown as a percentage. For example, if the interest rate is 5%, you pay 5% of the borrowed amount as interest each year.

### Sample Computation

If you borrow \$200 at an interest rate of 5% per year:

1. Calculate interest:  $\$200 \times 0.05 = \$10$
2. Total repayment amount:  $\$200 + \$10 = \$210$

### Key Points to Remember

- **Principal Amount:** The original amount you borrow.
- **Interest:** The fee for borrowing money.
- **Interest Rate:** The percentage of the loan amount, paid as interest.
- **Total Cost:** The loan amount plus interest.

### Why Understanding Interest is Important

Understanding interest helps you:

1. **Calculate Total Costs:** Know how much you will repay.
2. **Compare Loans:** Find the best interest rate.
3. **Avoid High Costs:** Choose loans with lower rates to save money.

**PREVIEW**



## True or False

Is the statement true or false?

1) Interest is a fee for borrowing money.	True	False
2) You only repay the exact amount you borrow.	True	False
3) Interest makes it more expensive to borrow money.	True	False
4) Lower interest rates save you money.	True	False
5) Interest rates are shown as percentages.	True	False

**Interest Calculations** Calculate the details for each loan, including the loan amount, interest rate, monthly payment, and total repayment amount.

Loan Amount	Interest Rate	Repayment Term	Monthly Payment	Total Repayment Amount
\$500	3%	2 years		
\$1,000	5%	3 years		
\$1,500	4%	4 years		

## Loan Decision

Decide which loan option you would choose. Explain your reasoning.

Loan Option	Loan Amount	Interest Rate	Repayment Term
Option 1	\$800	3%	2 years
Option 2	\$800	5%	3 years

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# Exit Cards

Cut Out

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

Name: \_\_\_\_\_

What is the total repayment?

Principal	Rate	Repayment
\$100	3%	
\$400	5%	
\$500	7%	
\$1000	10%	

Name: \_\_\_\_\_

What is the total repayment?

Principal	Rate	Repayment
\$100	3%	
\$400	5%	
\$500	7%	
\$1000	10%	

Name: \_\_\_\_\_

What is the total repayment?

Principal	Rate	Repayment
\$100	3%	
\$400	5%	
\$500	7%	
\$1000	10%	

Name: \_\_\_\_\_

What is the total repayment?

Principal	Rate	Repayment
\$100	3%	
\$400	5%	
\$500	7%	
\$1000	10%	

## Interest Rates

### What are Interest Rates?

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

### Examples of Interest Rates

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

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

### Factors Affecting Interest Rates

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

- People with good credit will tend to get a lower interest rate. Having good credit means that you have a history of paying back your loans. A lender would likely charge a friend a higher interest rate if you were worried they wouldn't pay back the loan on time.
- The type of loan impacts the interest rate. A mortgage is a long-term loan for the purposes of buying a house. The lender does a lot of work to make sure the borrower can afford to pay back the loan. This makes the loan more secure for the lender. A typical mortgage interest rate is between 2% and 4%.
- Credit card loans are riskier because it is easier to sign up for a credit card than to qualify for a mortgage. Credit card loans are often not paid back on time, which means the lender is out the money they lent out. This means they need to charge a higher interest rate, usually between 15%–25%.
- Where you get the loan will also affect the interest rate. If you go to a bank, you will likely get a fair interest rate. Banks are regulated by the Canadian government, which means they abide by rules setup to protect people who borrow money. You can also get loans in the form of a "Payday Loan", which are usually short-term loans that are paid back when someone gets paid from their employer. These loans can be dangerous, as they are much more expensive than credit cards and other loans offered from the bank. For example, a payday loan of \$300 for 2 weeks will cost you \$45 extra. The same loan using a credit card would cost you \$6.35.



**True or False**

Circle whether the statement is true or false

1) All interest rates are the same regardless of who you are borrowing from	T	F
2) Riskier loans have lower interest rates	T	F
3) People with good credit usually get better interest rates	T	F
4) Credit cards have lower interest rates, between 2% and 5%	T	F
5) Payday loans are expensive, with high interest rates	T	F

**Making a Connection** What did the reading remind you of in your life?

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**Questions**

Answer the questions using evidence from the text.

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

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

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## Calculating Interest Rates - Investments

When dealing with interest rates, we are either paying interest or being paid interest. When we invest money in a savings account, we are paid interest. We can also invest in the stock market in hopes of being paid interest on our investment. We can calculate how much return we will get on an investment by using the following steps.

### Steps to use % Button on a Calculator

- 1) Enter the investment amount.
- 2) Hit the  $\times$  button.
- 3) Type in the interest rate.
- 4) Hit the  $\%$  button (this will display how much earned from interest)
- 5) Hit the  $+$  button (this will give you the total return)



Question: Use the steps above to calculate the return on investment

#	Investment	15% Interest	Total Return
1	\$28	\$4.20	\$32.20
2	\$37		
3	\$41		
4	\$97		
5	\$150		
6	\$370		
7	\$525		
8	\$855		
9	\$1400		
10	\$2755		

## Calculating Interest Rates - Borrowing

When we borrow money, we usually have to pay interest on the total amount we borrowed. We call this amount the **principal**. Depending on the type of loan, the interest rates will vary.

Steps to use % Button on a Calculator:

- 1) Enter the principal amount
- 2) Hit the + button
- 3) Type the interest rate
- 4) Hit the = button (this will display how much interest you will pay each year)
- 5) Click the  $\Sigma$  button (this will give you the total amount you need to pay back)



Question: Use the steps above to calculate the return on investment

#	Principal	5-Year Loan	Total 5-Year Loan Amount
1	\$50	\$25	\$75
2	\$85		
3	\$152		
4	\$225		
5	\$310		
6	\$405		
7	\$510		
8	\$632		
9	\$780		
10	\$945		

## Calculating Interest

**Questions**

Calculate how much interest we will pay in the situations below

1) If you borrow \$600 for 6 years at an interest rate of 10%, how much interest will you pay?



b) How much in total will you pay?

2) How much interest does a \$430 investment earn at 6% over one year?

3) How much interest does an \$875 investment at 4% for six years?



4) How much interest will you have to pay if you borrow \$325 for 2 years at a 12% interest rate.

5) Jacob invested \$250 for 4 years. He earned \$40 of interest. He forgets his interest rate. He thinks it was either 5% or 10%. What was the real rate he got?



6) If you borrow \$1750 for 3 years at an interest rate of 6%, how much interest will you pay?

b) How much will you pay in total?

7) If you get a loan for \$225,000 to buy a house with an interest rate of 2%, how much interest will you pay for a 10-year loan?



8) Hanna paid \$28 of interest when she borrowed \$200. Her father said she paid 28% interest, but she says she only paid 14%. Who is correct?

# Exit Cards

**Cut Out**

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

Name: \_\_\_\_\_

1) Calculate the cost of the loan.

#	Principal	10% Interest/Year	5-Year Loan	Total 5-Year Loan Amount
1				
2				
3	\$1152			

2) You borrow \$800 for 5 years at an interest rate of 9%.

- How much interest will you pay?
- How much will you pay in total?

Name: \_\_\_\_\_

1) Calculate the cost of the loan.

#	Principal	10% Interest/Year	5-Year Loan	Total 5-Year Loan Amount
1	\$50			
2	\$100			
3	\$1152			

2) You borrow \$800 for 5 years at an interest rate of 9%.

- How much interest will you pay?
- How much will you pay in total?

## Blog Post: Borrowing Money Responsibly

### Smart Borrowing: Mastering the Art of Managing Debt

Date: June 17, 2024

Author: Tobias E.

3-minute read

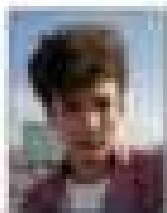
Borrowing money can be a powerful financial tool if used wisely. Knowing when and why to take on debt is key to financial success. For example, loans for education can boost your career potential, while mortgages may increase your wealth as property values grow.

However, irresponsible borrowing, like using high-interest credit cards for luxury items, leads to financial strain. In 2023, 28% of households making impulsive purchases on credit faced much higher interest rates.

It's crucial to have a budget, understand all terms and conditions, and borrow only what you need. With smart borrowing, you can support your financial goals without overwhelming you.

Till next time,  
Tobias E.

#### Comments:



John Carter - June 17, 2024

Insightful post, Tobias! Responsible borrowing, like student loans and mortgages, can be beneficial. It's also a way to build a good credit history if managed properly.

Like Reply 11h ago



Linda Grey - June 17, 2024

I see your point, John, but we need to stress the risks more. In 2023, the average Canadian credit card debt was about \$4,240, showing a trend toward excessive consumer debt that can be hard to manage. Encouraging savings over borrowing could help shift this trend.

Like Reply 8h ago

**Questionnaire**

If you were to lend someone money, what questions would you ask the borrower? List four.

1)

2)

3)

4)

**True or False**

True or false?

1) High-interest credit cards charged to a credit card	True	False
2) Mortgages can increase your wealth through property	True	False
3) A repayment plan is not crucial for borrowing money	True	False
4) Responsible borrowing can lead to a good credit rating	True	False
5) Saving money - instead of borrowing - can help manage debt	True	False

**Comment**

Write your own comment responding to the blog, sharing your thoughts on borrowing money responsibly.

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## Activity: Match the Borrowing Situation

### Objective

What are we learning about?

To help students learn about responsible borrowing by matching various borrowing scenarios ("If" situations) with appropriate outcomes ("Then" situations).

### Materials

What you will need for the activity

- "If" situation cards
- "Then" outcome cards



### Instructions

How you will complete the activity

1. Explain to the students that they will participate in a matching activity to learn about responsible borrowing.
2. Each student will receive one "If" situation card and one outcome card.
3. Hand out one card to each student. Make sure there is an equal number of "If" and "Then" cards.
4. Students will move around the classroom to find the person holding the card that matches theirs.
5. When they find their match, they should sit together and discuss why their cards are a good match.
6. Once all pairs have found their match, bring the class back together.
7. Each pair will present their "If" situation and "Then" outcome to the class.
8. Discuss why the matches are appropriate and how responsible borrowing can help achieve financial goals.

41 Situation Cards

Cut out the topics below

If you need to buy a house...

If you want to go on a vacation...

If you need to pay for college tuition...

If you want to start a business...

If you need a car for work...

If you want to buy luxury items...

If you need to pay for medical expenses...

If you want to renovate/repair your home...

If you need to 'consolidate' your debt...

If you want to invest in education...

If you need to cover unexpected emergencies...

If you want to buy a new phone...

If you need to pay for a wedding...

If you want to buy new clothes...

If you need to repair your car...



## Then Outcome Cards

Cut out the topics below.

Then use an emergency savings fund or low-interest loan.

Then consolidate debt with one, personal loan.

Then get an auto loan with affordable terms.

Then avoid borrowing and save money gradually.

Then apply for education grants or scholarships.

Then save up money to pay for the expenses.

Then avoid borrowing that piles up over time.

Then take a home equity loan for a line of credit.

Then use savings or an affordable credit card if necessary.

Then take out a mortgage with a low interest rate.

Then save up money instead of borrowing.

Then consider saving up instead of borrowing.

Then apply for a small business loan.

Then consider a medical loan or payment plan.

Then use a student loan with a low interest rate.

**PREVIEW**

## Fees – Banking and Borrowing

### What Are Fees?

A **fee** is a charge that is paid by a customer in exchange for using a service. For example, when you setup a new bank account, you may owe a one-time setup fee, of say \$10. These fees may be charged on a one-time or ongoing basis. An on-going fee could be a monthly bank account fee of \$15 a month.

### What Do We Pay Bank Fees For?

Most bank accounts cost a monthly fee. Canadians on average spend \$225 a year in bank fees. People typically pay fees in exchange for the following services:

- Taking money out of a bank using ATM's
- Using a debit card
- Financial advice on what to do with our money
- Keeping our money safe
- Sending our money to other banks
- Online banking
- Completing transactions (e.g. use of a debit card)
- Checking and savings accounts earn interest for the money we store at the bank



### Per-Transaction Fees

Fees can be charged for each transaction we make. For example, when we take money out of an ATM, we will sometimes need to pay a fee that is a percentage of the amount we take out. This means if you want to take \$20 out of your bank account, you will have to take out \$24. Using an ATM that your bank is responsible for will likely be free, but other ATM's will often cost an additional fee.

Sending electronic money transfers (EMT) can also be charged on a per-transaction basis. This means when you send an email transfer, you could be charged a fee of \$1.50 per transaction.

Different bank accounts will give you access to a certain amount of debit transactions per month. If you are on a free bank account, you could be limited to 10 or less transactions (number of times you can use your debit card). If you use it more than 10 times, you will be charged a per-transaction fee that could become costly.

### Understanding The Details Of Your Bank Account

Bank accounts that are free with no monthly cost tend to offer less features, like no free ATM withdrawals or no free electronic money transfers. So, while you save on the monthly fees, your per-transaction costs could add up quickly.

It is important to understand how you plan to use a bank account before you choose a type of bank account. If you don't plan to make any EMT's or withdrawals from ATM's, you could choose the free option.



## Fees – Banking and Borrowing - Questions

**True or False:**

Circle whether the statement is true or false.

1) A fee is always a one-time fee, like to open up a bank account.	True	False
2) Common per transaction fees are ATM withdrawals and EFT transactions.	True	False
3) All bank accounts offer the same services.	True	False
4) Per transaction fees can add up quickly.	True	False
5) Free bank accounts are always the best option for customers.	True	False

**Fees:** Circle the fees below based on the scenario.

1) You send 9 e-Transfers at a cost of \$1.50 per transaction.	
2) You use your debit card to buy a new pair of shoes. Your plan only allows you to use your debit card once a month. An extra debit transaction costs \$1.00.	
3) You withdraw from an ATM 9 times last year. You went to your bank's ATM 3 of the times. The other times you were charged \$3.50 each withdrawal.	
4) You pay \$14.99 per month for your bank account. How much did you pay last year in bank fees?	
5) You sent 7 e-Transfers for \$1.50 each transaction and withdrew money from an ATM 4 times with a per-transaction fee of \$3.00 each time.	

**Questions:**

Answer the questions using evidence from the text.

1. Why is it important to understand the details of our bank accounts?

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2. Why are per-transaction fees often more costly than paying a higher monthly fee?

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## Choosing a Bank Account


**Sale!**

**Limited Time Offer!**


### Super Bank – The Essentials Banking

- Free monthly fee
- 12 debits per month, \$1.25 each thereafter
- 6 free e-transfers, \$1.50 each thereafter
- Receive 1 Super Bank point for every \$1 you spend
- Using Non-Super Bank ATM in Canada - \$2 each
- Using Non-Super Bank ATM outside of Canada - \$5 each
- Using debit card outside of Canada - \$1 each debit
- Bank drafts - \$8 each
- Free online banking

### Super Bank – No Limit Banking

- \$14.99 monthly fee
- Unlimited debits per month
- Unlimited e-Transfers per month
- Receive 1 Super Bank point for every \$1 you spend
- Free use of any ATM, anywhere in the world
- Use debit card free anywhere in the world
- 6 free bank drafts/year, \$8.00 each thereafter
- Free online banking
- Receive a new Quality brand 50-inch TV free just for signing up!

### Decision Time!

If you were the person behind Jill, which bank account would you choose?

Jill is trying to figure out which bank account is right for her. She wrote down all of her financial habits in the table below and needs your help to figure out how much each habit will cost for both bank accounts.

Financial Habit	Essentials	No Limit
1) Monthly fee		
2) Jill plans to use her debit 15 times a month		
3) She plans to send 8 e-Transfers each month		
4) Jill plans to use her debit card 3 times a month outside of Canada		
5) She thinks she will use non-Super Bank ATMs 2 times a month		
6) She will use ATM machines outside of Canada once per month		
<b>Total Cost</b>		
7) She will spend around \$500 a month. How many reward points will she earn?		

## Choosing a Bank Account - Questions

### Questions

Answer the questions based on the results of your research

1. Which bank account should Jill choose – Essentials or No Limits? Explain your choice.

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2. Are free bank accounts always the best? Why is it important to research bank accounts before you choose?

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### Your Turn!

Which bank account would you choose based on your findings? Explain.

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**PREVIEW**

## Creating Bank Account Details - Assignment

Banks are businesses that want our money. If banks don't get new customers, they could go out of business.

### Assignment

You are hired to create bank accounts that will entice people to join

Your boss wants you to create two bank accounts that has will make the bank a lot of money, but also entice customers to want to join. Create two different accounts, one with a high monthly fee and one that is free with extra per-transaction fees.

**PREVIEW**

1) Who should get the first option of bank account? Describe the benefits.

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2) Who should get the second option of bank account? Describe the benefits.

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## Distribution of Financial Resources

### Distributing Financial Resources

In 2020, there was approximately 106.93 billion Canadian dollars worth of banknotes in circulation. This is cash, which does not account for all of the money that is in Canada, but it does give you an idea that there is not an infinite amount of money out there.

The **distribution of financial resources** is how the money is shared among all people and a business. Did you know that the richest 1% of people in Canada own 25.6% of the country's money? Furthermore, the top 10% own around 55% and even more shocking, the bottom 50% have less than 6% of Canada's money.

### Business Donations

When we see people who are in need of financial resources, we can choose to donate some of our money to them. Businesses can donate to charities by sending them money to help these charities out.

General Mills and Unilever have a policy of donating to charities. They match any donations made by their employees. If you worked for General Mills, and you donated \$100 to the Canadian Cancer Foundation, General Mills would also send \$100. In addition, if you volunteered at a charity event, such as a golf tournament, if the event raised \$10,000, General Mills would match that donation and send \$10,000 to the charity.

### How We Can Help

We can donate our time, services, and money to people who are in need. **Volunteering** is an excellent way for someone who does not have excess money to donate to still make a significant difference. You can donate your time by volunteering and performing a service that you are skilled at.

The Canadian Red Cross is a Canadian charitable organization that helps people in Canada that have been affected by an emergency or disaster. If you didn't have money to donate, you could donate your service by joining the team and volunteering to help people in need.

We can also donate to charities like our local food banks. These food banks collect money and non-perishable food items so they can give them to people in need. This helps balance the distribution of financial resources. If everyone donated, the balance of financial resources would be less uneven, and more people would live comfortably.



## Distribution of Financial Resources - Questions

### True or False

Circle whether the statement is true or false

1) All financial resources are distributed equally in Canada	True	False
2) We can help balance the distribution of financial resources by donating.	True	False
3) The richest 1% of Canadians own more than 25% of the money	True	False
4) We can donate money to charities and people	True	False
5) Some people donate a lot of money to charities	True	False

### Action Plan

What do you do with your time or money? What services are you good at?

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### Questions

Answer the questions using evidence from the text.

1. Do you think it is fair that the distribution of financial resources is so unbalanced?

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2. Do you think all businesses donate money like Google and General Mills?

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# Exit Cards

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

Name: \_\_\_\_\_

Mark

/5

Fill in the blank space.

1) In 2020, there were about \_\_\_\_\_ billion Canadian dollars worth of banknotes in circulation.

2) The richest 1% of people in Canada own \_\_\_\_\_ % of the country's money.

3) Businesses like Google may \_\_\_\_\_ employee donations to charities.

4) \_\_\_\_\_ is when people give their time or services to help others without being paid.

5) Local \_\_\_\_\_ banks collect food to give to people who need help.

**PREVIEW**

Name: \_\_\_\_\_

Mark

Fill in the blank space.

1) In 2020, there were about \_\_\_\_\_ billion Canadian dollars worth of banknotes in circulation.

2) The richest 1% of people in Canada own \_\_\_\_\_ % of the country's money.

3) Businesses like Google may \_\_\_\_\_ employee donations to charities.

4) \_\_\_\_\_ is when people give their time or services to help others without being paid.

5) Local \_\_\_\_\_ banks collect food to give to people who need help.

## Role-Play: Trading, Lending, Borrowing and Donating

### Objective

What are we learning about?

Students will understand how resources can be shared between individuals and organizations by exploring four different methods: trading, lending, borrowing, and donating. Through role-playing scenarios, students will learn how each method works and the effects it can have on people and communities.

### Materials

What you will need for the activity

- Scenario cards for situations involving trading, lending, borrowing, and donating (provided)
- Props or costumes for role-play



### Instructions

How to conduct the activity

1. Divide the class into small groups.
2. Provide each group with a scenario card that describes a situation involving one of the four concepts: trading, lending, borrowing, or donating.
3. In each group, assign roles to the students that correspond to the roles on their card (e.g., a person trading goods, a lender, a borrower, or someone donating to a cause).
4. If available, provide props or simple costume pieces that can help students represent their roles more effectively.
5. Set a timer for groups to plan and rehearse their role-play.
6. Invite each group to perform their role-play for the class, showing how resources are distributed in their scenario.
7. After each presentation, hold a short class discussion about the type of resource distribution shown, how it worked, and its potential benefits and drawbacks.
8. Conclude by having students fill out a short reflection sheet describing what they learned about the different ways resources can be shared between individuals and organizations.

Scenario Cards

Cut out the topics below.

Scenario	Type of Resource Sharing	Detailed Description
The Snack Stand Swap	Trading (Goods)	During a school cultural fair, students have stands with snacks from different cultures. Two students agree to trade a samosa for a cupcake. The role-play explores fairness in trades and how culture can influence what is considered valuable.
Sports Gear Loan	Lending	A student wants to join a community soccer team but can't afford cleats right now. Another student lends them a pair for the season. The role-play discusses trust, responsibility, and how sharing resources can remove barriers to participation.
Borrowing Musical Talent	Borrowing (Services)	A school talent show needs a band player for a group performance. One student borrows the skills of a friend who is busy with art for the friend's project. The role-play shows how borrowing can involve services, not just objects.
Warm Winter Campaign	Donating (Goods)	A winter clothing drive encourages students to donate jackets, hats, and mittens to newcomers in the community. Role-play includes deciding what items to give, how it helps others, and discussing cultural or climate needs of recipients.

**PREVIEW**

**Scenario Cards**

Cut out the topics below.

Scenario	Type of Resource Sharing	Detailed Description
Rare Game Card Deal	Trading (Goods)	Two students negotiate a trade involving rare video game cards. The role-play focuses on making trades fair, understanding perceived value, and considering long-term vs. short-term benefits.
Tool Lending Program	Lending (Goods/Services)	A school's tech club lends robotics kits to the classroom for a week. In return, they offer to help younger students in using them. Role-play on lending can include training or support (services).
Borrowing Time	Borrowing (Donated Time)	The organizer of a school event needs extra help one week. A "friend" borrows time from a friend who agrees to help them in exchange for future help. Role-play discusses how time can be shared as a resource.
Fundraiser for Flood Relief	Donating (Monetary)	After severe flooding in another part of the country, students organize a fundraiser to collect money for disaster relief. Role-play explores why money might be the most effective resource in this context compared to goods or services.

**PREVIEW**

**Peer Assessment**

Mark a group member using the checklist below.

<b>My Name</b>		<b>Who I Am Assessing</b>	
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Criteria	Description	Stars (1: Needs Improvement, 5: Best)
Stayed in Character	The student remained in character throughout the performance.	☆☆☆☆☆
Listened to Others	The student listened carefully and responded appropriately to others.	☆☆☆☆☆
Supported Others	The student accepted others' ideas and supported the scene.	☆☆☆☆☆
Showed Creativity	The student demonstrated creativity in their performance and ideas.	☆☆☆☆☆
Used Body Language	The student used body language to express their character and actions.	☆☆☆☆☆
Spoke Clearly	The student spoke clearly enough to be heard.	☆☆☆☆☆
Contributed to the Story	The student helped to develop the story forward.	☆☆☆☆☆
Reacted to Situations	The student reacted appropriately to situations presented in the scene.	☆☆☆☆☆



**Learn and Question**

**Learn:** Write two things you learned from the role play.  
**Question:** Ask one question you have from the role play.

<b>Learn</b>	<hr/> <hr/> <hr/>
<b>Learn</b>	<hr/> <hr/> <hr/>
<b>Question</b>	<hr/> <hr/> <hr/>

Reflection

Answer the questions below

1) Which types of resources (monetary, goods, services, donated time) were shown in your role-play? Explain.

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2) Which resource do you think is most valuable in your community right now? Why?

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3) In your role-play, what method (trading, lending, borrowing, donating) was used instead of a different method?

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4) How could the same scenario have worked differently if resources were shared differently?

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5) Were there any situations where a method of sharing might cause problems or misunderstandings? Explain.

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**PREVIEW**

## Matching Game: Review Financial Literacy Terms

### Objective

What are we learning about?

Reinforce students' understanding of financial literacy terms and their corresponding definitions through a collaborative memory game.

Materials: \_\_\_\_\_ you will need for the activity.

- Pre-made cards with financial literacy terms (e.g., budget, inflation, interest)
- Small bags or envelopes for each group



### Instructions

How you will complete the activity

1. Before the class, the teacher will cut out \_\_\_\_\_ matching game cards.
2. Divide the students into small groups and give each group \_\_\_\_\_ containing a set of the matching cards.
3. In their groups, students will spread out the cards face down on their table.
4. Each student takes a turn flipping two cards – one term and one definition – trying to find a matching pair (e.g., "budget" and "a plan for how to spend and save money").
5. If they find a correct match, they keep the cards out and continue with their next turn. If the cards don't match, they turn them back over in the same place, and the next player takes a turn.
6. The activity continues until all pairs are correctly matched within each group.

## Cards

## Sorting Game Cards

Financial Literacy Term	Matching Definition
Cash	Physical money in the form of coins or bills
Debit Card	A card that takes money directly from your bank account when making purchases
Credit Card	A card that lets you borrow money from a bank to pay for purchases
Electronic Wallet	A digital way to store payment information on a device for purchases
E-Transfer	Sending money electronically from one bank account to another

**PREVIEW**

Cards

Sorting Game Cards

Financial Literacy Term	Matching Definition
Coupon	A voucher that gives a discount on goods or services
Goods	Physical items people buy or use
Services	Work or other services provided by others in exchange for payment
Short-Term Goal	Something you want to achieve soon, within a year
Long-Term Goal	Something you plan to achieve over many years

**PREVIEW**

## Cards

## Sorting Game Cards

Financial Literacy Term	Matching Definition
Investing	Using money to buy assets that can grow in value over time
Budget	A plan for how to spend and save money
Income	Money you receive from work or other sources
Expenses	Money you spend on goods, services, or bills
Interest Rate	The percentage charged or earned on borrowed or saved money

**PREVIEW**

## Financial Literacy – Unit Test

**Part 1**

Matching – Write the letter beside the description of the method of payment

Method of Payment	Description
_____ Gift Card	a) Using a card with \$100 on it that has already been purchased from a store
_____ Check	b) Paying with a card that links to your bank account
_____ Coin	c) Paying with coins or bills
_____ Money Order	d) Sending money to a friend using email
_____ Cash	e) Giving a piece of paper to someone that shows how much money you want them to take out of your bank account for
_____ Debit Card	f) Paying for things with borrowed money

**Part 2**

How much would you save by changing your spending habits in the situations below?

1) Stop buying a \$2.50 pop each day from vending machines for one year.	
2) Stop buying a \$2.25 bag of candy 3 three times a week for one year.	
3) Stop buying a \$7.00 lunch twice a week for one year.	
4) Stop buying video game add-ons for 5 years that cost \$25 a month.	
5) Stop paying for a video game subscription for 5 years that costs \$129 each year.	

## Part 3

How much would you earn in the situations below?

1) Selling 5 homemade wallets a day at \$5 a wallet for 20 days.	
2) Selling 10 cups of lemonade a day for \$2.50 a cup for 30 days.	
3) Sell 90 bags of homemade kettle chips a month (30 days) for \$8 a bag for 5 years.	
4) Perform odd jobs for 5 hours a day for 1 month (30 days) at \$15 an hour.	
5) Post 10 videos a week where each video earns you \$2 a day. How much would you earn?	

## Part 4

How can the following factors help you achieve your financial goals?

Changes in...	Example - "I can... to increase my income"
Income	
Expenses	
Family Situation	

## Part 5

How do social inequalities affect people's ability to achieve their financial goals?

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## Part 6

Calculate the fees below based on the scenario.

1) You send 8 e-Transfers at a cost of \$1.50 per transaction.

2) You withdrew from an ATM 12 times last month. You went to your bank's ATM 3 of the times. The other times you were charged \$3.50 each withdrawal.

3) You pay \$1.20 a month for your bank account. How much did you pay last year in bank fees?

4) You sent 9 e-Transfers for \$1.50 per transaction and withdrew money from an ATM 3 times with a per-transaction fee of \$3.50 each time.

## Part 7

Answer the questions.

1) If you borrow \$500 for 6 years at an interest rate of 10%, how much interest will you pay?

2) How much interest does a \$700 investment earn at 6% over one year?

3) How much interest is earned on a \$1050 investment at 4% for six years?

4) Nicole paid \$60 of interest when she borrowed \$400. Her father said she paid 30% interest, but she says she only paid 15%. Who is correct?



# Google Slides Lessons Preview





# Ontario Math Curriculum

## Algebra – Patterns, Equations – Grade 6

### 3-Part Lesson Format

#### Part 1 – Minds On!

- Learning Goals
- Discussion Questions
- Quotes
- And More!

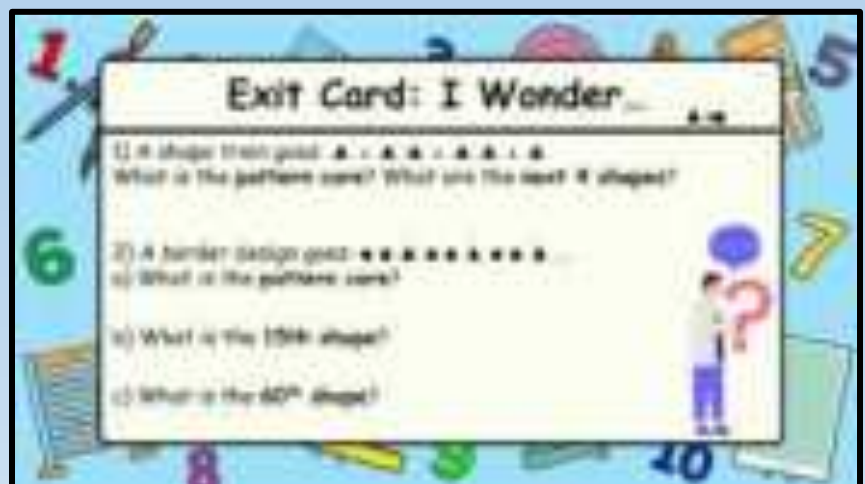


#### Part 2 – Action!

- Writing
- Matching
- Drag and Drop
- Drawing
- And More!

#### Part 3 – Consolidation!

- Exit Cards
- Quizzes
- Reflection
- And More!





# Ontario Math Curriculum

## Algebra – Patterns, Equations – Grade 6

### Translating Patterns - A/B Patterns

Translate the first pattern into a new pattern using different colours.

Working Space:  
Draw the first pattern on the grid. Then draw the second pattern on the grid.

	A	B	A	B	A	B	A
1	☆	☆	☆	☆	☆	☆	☆
2	○	○	○	○	○	○	○
3	♥	♥	♥	♥	♥	♥	♥

Shape Bank

- ☆ (purple)
- (blue)
- ☆ (red)
- (orange)
- ♥ (blue)
- ♥ (orange)

### Patterns - Shapes

Draw the next shape in the pattern.

Figure 1	Figure 2	Figure 3	Figure 4

### Number Patterns

0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1
0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2
0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3
0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4
0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6
0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7
0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8



# Ontario Math Curriculum

## Algebra – Patterns, Equations – Grade 6

### Increasing Patterns Within Number Strings - 5a

Continue the increasing patterns below.

145	150	155							
778	783	788							
7557	7562	7567							
1004	1009	1014							

### Translating Decreasing Patterns

A snowflake changes the number of arms by 1 in every 2nd iteration. How many arms will it have in the 5th iteration?

Iteration	1	2	3	4	5
Number of arms	6	5	4	3	2

### Area and Perimeter

Use the grid to draw a square with a side length of 4 units. Label the side length and the perimeter.

Side Length	4 units
Perimeter	16 units

Use the grid to draw a rectangle with a length of 5 units and a width of 3 units. Label the side lengths and the perimeter.

Length	5 units
Width	3 units
Perimeter	16 units



# Workbook Preview













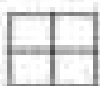
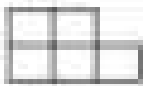




**Grade 6**  
**C1. Patterns and Relationships**

	<b>Curriculum Expectations</b>	<b>Pages</b>
C1.1	Identify and describe repeating and growing patterns, including patterns found in real-life contexts	5 – 8, 12 – 13, 59 – 64
C1.2	<p style="color: red; font-size: 1.2em;"><b>Preview of 130 pages from this product that contains 401 pages total.</b></p>	
C1.3	determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating and growing patterns	15 – 19, 25, 31 – 44, 65 – 80
C1.4	create and describe patterns to illustrate relationships among whole numbers and decimal tenths	20 – 24, 26 – 30, 45 – 58

# Increasing Patterns – Shapes


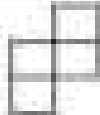




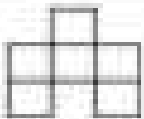


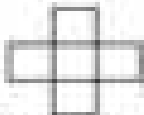
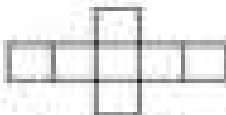
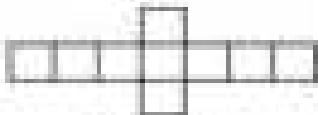



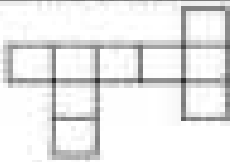
## Part 1

Shade in the block that was added to the pattern

1)				
2)				
3)				
4)				

## Part 2

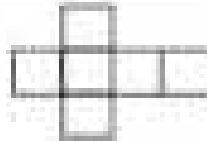
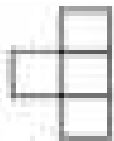
Shade in the two blocks that were added to the pattern

1)				
2)				
3)				
4)				

## Creating Increasing Patterns with Squares

**Part 1**

Draw the next figure in the pattern by adding the correct number of blocks.

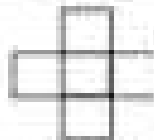
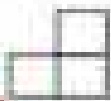


1) Figure 1

Figure 2

Figure 3

Figure 4

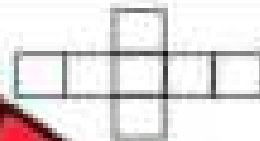


2) Figure 1

Figure 2

Figure 3

Figure 4



3) Figure 1

Figure 2

Figure 3

Figure 4

**Part 2**

Draw increasing patterns using patterns like these.

1) Figure 1

Figure 2

Figure 3

Figure 4

2) Figure 1

Figure 2

Figure 3

Figure 4

3) Figure 1

Figure 2

Figure 3

Figure 4

## Increasing Pattern Rules - Adding

### Part 1

Continue the increasing patterns below

1) 47, 55, 63, \_\_\_\_\_

Pattern Rule: Start at 47, add \_\_\_\_\_ each time

2) 108, 114, \_\_\_\_\_

Pattern Rule: Start at \_\_\_\_\_ add \_\_\_\_\_ each time

3) 205, 217, \_\_\_\_\_

Pattern Rule: Start at \_\_\_\_\_ add \_\_\_\_\_ each time

4) 326, 342, 358, \_\_\_\_\_

Pattern Rule: Start at \_\_\_\_\_ add \_\_\_\_\_ each time

5) 482, 499, 516, \_\_\_\_\_

Pattern Rule: Start at \_\_\_\_\_ add \_\_\_\_\_ each time

### BONUS

Lily gets paid based on how fast she works. She is getting faster each day! Check out her paycheque for the last 5 weeks.

Week	Pay
1	100
2	120
3	150
4	190
5	240

#### Question

How much will she make in week 10 if the pattern continues?

### Part 2

Write your own patterns using the rules

1) \_\_\_\_\_

Pattern Rule: Start at 124, add 7 each time

2) \_\_\_\_\_

Pattern Rule: Start at 485, add 15 each time

3) \_\_\_\_\_

Pattern Rule: Start at 382, add 6 each time

4) \_\_\_\_\_

Pattern Rule: Start at 505, add 12 each time

## Increasing Patterns – Word Problems

### Questions

Solve the word problems below

1) Courtney is heading to college in 6 months. She begins saving more and more money. Her savings are represented in the table of values.



Month	Savings
April	500
May	800
June	1200
July	1700
August	

a) What is the pattern rule?

b) If the pattern continues, how much will she save at the end of the 6 months she goes to college?

2) Billy is improving at basketball. In the first 3 games of the season, his points per game have been represented in the table.



Games	Points
1	3
2	8
3	9
	15
	23
	30

a) What is the pattern rule?

b) If the pattern continues, how many points will he score in the 10<sup>th</sup> game?

3) Emmett has a math test next week. He plans to study each night for the next 7 nights. The first night he will study for 10 minutes. The second night he will study for 10 minutes plus an additional 10 minutes. The third night he will study for 10 minutes plus an additional 20 minutes. The fourth night he will study for 10 minutes plus an additional 30 minutes.

Night	1	2	3	4	5	6	7
Minutes							

a) Complete the table of values

b) If his studying pattern continues, how many minutes will he study on the 10<sup>th</sup> night?



## Counting by Tenths – Decimal Pattern

**Questions**

Continue counting by tenths by filling in the missing boxes

0.1	0.2									1.0
		5.7						6.3		1.1
										1.2
	9.4									
4.8		12.2		12.9		10.6				
										2.0
	8.6									
					11.3					
4.0										
						7.9				
										2.8
		3.5								2.9

**Increasing Decimal Pattern Rules - Tenths****Part 1****Increasing Patterns - Tenths**

1) 6.0, 8.0, 10.0, \_\_\_\_\_

Pattern Rule: Start at 6.0, add 2.0 each time.

2) 5.8, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

3) 12.1, 13.0, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

4) 18.1, 19.2, 20.3, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

5) 34.2, 34.4, 34.6, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

**Part 2**

Fill in the boxes below by continuing the pattern.

1) 15.2    15.4    15.6    \_\_\_\_\_

2) 55.0    55.5    56.0    \_\_\_\_\_

3) 102.6    102.9    103.2    \_\_\_\_\_

4) 142.2    142.7    143.2    \_\_\_\_\_

# Counting by Hundredths – Decimal Pattern

**Questions** Continue counting by hundredths by filling in the missing boxes.

0.01	0.02								0.10
	0.56								0.11
									0.12
								0.64	
						1.03			
	0.47								
									0.20
			1.19		1.32				
	0.88							0.74	
0.41						1.13			
				0.81					
									0.28
			0.35						0.29



# Shrinking Decimal Patterns - Tenths

**Part 1**

## Decreasing Patterns - Tenths

1) 14.0, 13.0, 12.0, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

2) 25.3, 24.7, 24.1, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

3) 34.5, 34.0, 33.5, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

4) 48.8, 48.7, 48.6, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

5) 72.9, 71.8, 70.7, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

**Part 2**

Fill in the boxes by continuing the decreasing pattern.

1)	16.4	16.0	15.6				
----	------	------	------	--	--	--	--

2)	28.8	28.1	27.4				
----	------	------	------	--	--	--	--

3)	58.9	57.5	56.1				
----	------	------	------	--	--	--	--

4)	97.2	96.0	94.8				
----	------	------	------	--	--	--	--



## Shrinking Decimal Patterns Word Problems

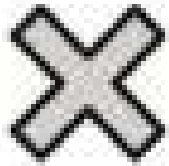
**Questions**

Answer the questions below



Word Problems	
1	A candle is 10.5 cm tall. After each hour, it burns down by 0.75 cm. How tall will the candle be after 5 hours?
2	Scientists are measuring the temperature of a cooling liquid. It starts at $92.4^{\circ}\text{C}$ and drops by $2^{\circ}\text{C}$ every 10 minutes. What will be the temperature after 6 intervals of 10 minutes?
3	A snowboarder starts at 100 meters above the ground and descends 12.75 meters per minute. How high will the snowboarder be after 7 minutes?
4	The hopscotch game has squares labeled $1.5$ , $2.5$ , $3.5$ , $4.5$ , $5.5$ , $6.5$ , $7.5$ , $8.5$ , $9.5$ , $10.5$ , $11.5$ . Identify the missing numbers and describe the pattern.
5	A hot cup of coffee is $85^{\circ}\text{C}$ . Every 5 minutes, it cools by $5.55^{\circ}\text{C}$ . What will be the temperature after 6 intervals?
6	A drone's battery starts at 100% and loses 7.5% every 10 minutes. What percentage will be left after 50 minutes?

## Increasing Patterns - Multiplication



Pattern Rule: Start at 2, multiply by 2 each time.



### Questions

### Increasing Patterns - Multiplication

1) 1, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

6) 2, 8, 32, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

2) 4, 20, 100, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

7) 3, 15, 75, 375, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

3) 3, 18, 108, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

8) 3, 15, 75, 375, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

4) 10, 100, 1000, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

9) 7, 21, 63, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

5) 10, 50, 250, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

10) 6, 24, 96, \_\_\_\_\_

Pattern Rule: \_\_\_\_\_

PREVIEW

## Pattern Rule – Multiplication

**Part 1**

Continue the increasing patterns below

1) 4, 20, 100, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern Rule: Start at 4, multiply by \_\_\_\_\_ each time

2) 2, 8, 32, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern Rule: Start at 2, multiply by \_\_\_\_\_ each time

3) 12, 24, 48, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern Rule: Start at 12, multiply by \_\_\_\_\_ each time

4) 5, 25, 125, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern Rule: Start at 5, multiply by \_\_\_\_\_ each time

5) 8, 24, 72, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern Rule: Start at 8, multiply by \_\_\_\_\_ each time

**Part 2**

Write your own patterns using the pattern rule

1) \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern Rule: Start at 9, multiply by 2 each time

2) \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern Rule: Start at 6, multiply by 3 each time

3) \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern Rule: Start at 4, multiply by 5 each time

4) \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern Rule: Start at 10, multiply by 2 each time

**Pattern Rule - Division****Part 1**

Continue the decreasing patterns below

#	Pattern	Rule = _____
1)	15 625, 3 125, 625, 125, 5	
2)	3 072, 768, 192, 48, 12, 3	
3)	5 184, 864, 144, 24, 4	
4)	1 101, 189, 63, 21, 7	
5)	1 024, 256, 64, 16, 8	
6)	18 750, 3 750, 750, 150	

**Part 2**

Write your own patterns up

1) \_\_\_\_\_

Pattern Rule: Start at 256, divide by 2 each time

2) \_\_\_\_\_

Pattern Rule: Start at 1 458, divide by 3 each time

3) \_\_\_\_\_

Pattern Rule: Start at 25 000, divide by 5 each time

4) \_\_\_\_\_

Pattern Rule: Start at 4 096, divide by 4 each time

## Task Cards: Patterning – All Operations

### Objective

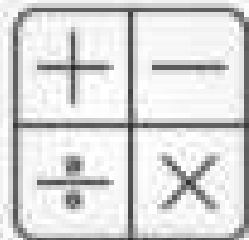
What are we learning about?

To recognize and create patterns using the four basic mathematical operations.

### Materials

What you will need for the activity

- 24 task cards
- Answer recording sheet for answers
- Timer



### Instructions

How you will do the activity

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

## Task Cards

Cut out the task cards below

**Card 9:**

Start with 36. Subtract 6 and then divide by 3 for the next number. What is the second number?

- a) 10
- b) 12
- c) 9

**Card 13:**

Start with 40. Subtract 5 and then add 10 for the next number. What is the second number?

- a) 50
- b) 45
- c) 55

Begin with 60. Add 15 and then add 15 for the next number. What is the second number?

- a) 35
- b) 20
- c) 25

**Card 14:**

Begin with 72. Divide by 6 and then add 3 for the next number. What is the second number?

- a) 15
- b) 12
- c) 18

**Card 11:**

Start with 18. Multiply by 2 and then subtract 6 for the next number. What is the second number?

- a) 30
- b) 36
- c) 24

Start with 40. Multiply by 2 and then subtract 6 for the next number. What is the second number?

- a) 40
- b) 46
- c) 32

**Card 12:**

Begin with 50. Add 10 and then subtract 5 for the next number. What is the second number?

- a) 45
- b) 55
- c) 60

**Card 16:**

Begin with 80. Subtract 10 and then divide by 2 for the next number. What is the second number?

- a) 30
- b) 35
- c) 40

**PREVIEW**

## Task Cards

Cut out the task cards below

**Card 17:**

Start with 90. Divide by 3 and then add 5 for the next number. What is the second number?

- a) 30
- b) 25
- c) 35

**Card 21:**

Start with 48. Subtract 8 and then multiply by 2 for the next number. What is the second number?

- a) 70
- b) 80
- c) 56

Begin with 20. Subtract 5 for the next number. What is the second number?

- a) 30
- b) 35
- c) 28

**Card 22:**

Begin with 52. Add 6 and then divide by 2 for the next number. What is the second number?

- a) 25
- b) 29
- c) 28

**Card 19:**

Start with 50. Add 10 and then multiply by 3 to get the next number. What is the third number?

- a) 315
- b) 325
- c) 330

Start with 10. Add 3 for the next number. What is the second number?

- a) 13
- b) 10
- c) 11

**Card 20:**

Begin with 64. Divide by 8 and then add 7 for the next number. What is the second number?

- a) 15
- b) 14
- c) 12

**Card 24:**

Begin with 45. Subtract 10 and then divide by 5 for the next number. What is the second number?

- a) 5
- b) 7
- c) 8

**PREVIEW**

## Types of Patterns

Steve deposits \$5 a day into his bank account. He tracks this below.

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
						 5
 5	 10	 15	 20	 25	 30	 35
 10	 15	 20	 25	 30	35	40
		18	19	20	21	22
23			24	27	28	29
30						

### Questions

Answer the questions below using the calendar

1) How is this a repeating pattern?

---



---



---

2) How could this also be an increasing pattern?

---



---



---

3) After 13 days, how much money would Steve have?

---



---

4) After this month, how much money would Steve have?

---



---

5) If he started with \$50 in his bank account, and then kept depositing \$5 for 60 days, how much money would he have in total?

---



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## Table of Values

### Questions

Answer the questions below by using the table of values.

When you work an hour, you get paid 32 dollars. Fill in the table to learn more about your earnings.

1) How many dollars will you make if you work 5 hours?

2) How many dollars will you make if you work 10 hours?



Hours Worked	Money Made
1	
2	
3	
4	
5	
10	

Weeks	KM Run
1	
2	
3	
4	
5	
10	

You are training for a marathon, so you run 42km a week.

1) How many kilometers will you run after 5 weeks?

2) How many kilometers will you run 42km for 10 weeks?

Chris is studying for a science test next week. Each night he studies for 45 minutes.

1) How many minutes does he study after 5 nights?

2) How many minutes does he study after 8 nights?

3) How many nights does he need to study for to study for 585 minutes?

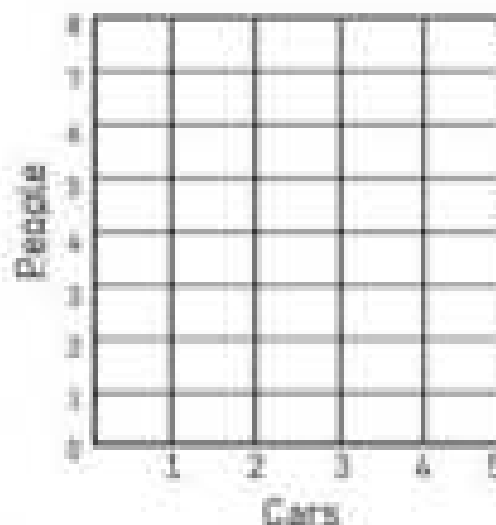
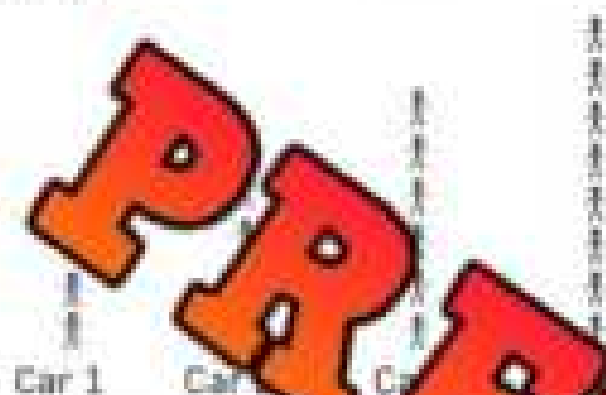
Nights	Minutes
1	
2	
3	
4	
5	
8	

## Graphing Patterns – Table of Values

### Questions

Translate the increasing patterns into a table of values and a graph

A train has the following people in each train car.



Term Number (Cars)	1	2	3	4	5	6
Term Value (People)						

1) What is the pattern rule? Start at \_\_\_\_\_

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?

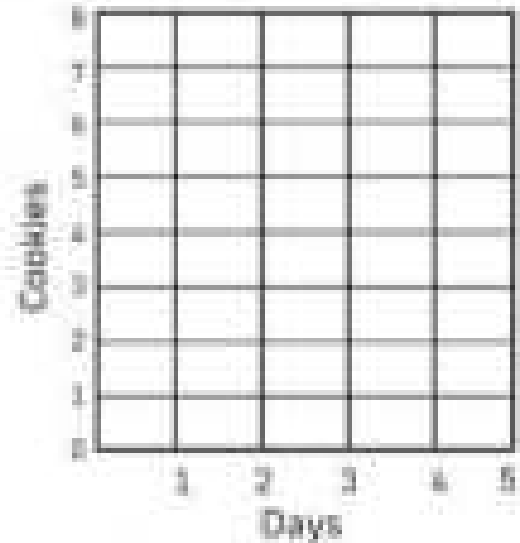
4) How many people would be in train car 20?

## Graphing Decreasing Patterns

### Questions

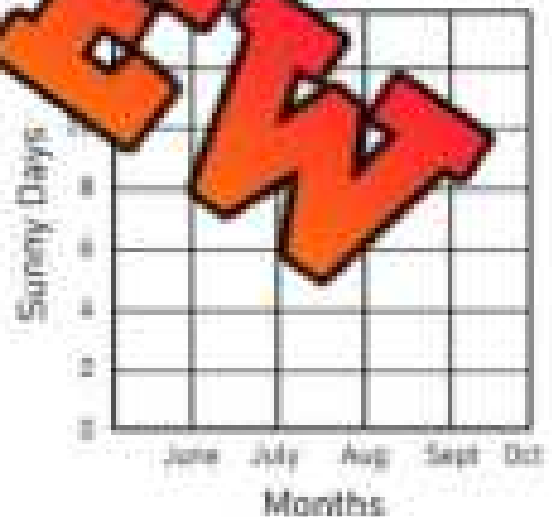
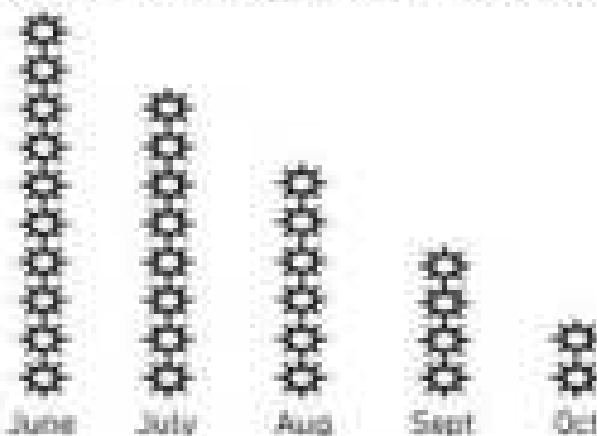
Translate each shrinking pattern into a table of values and a graph

1) Kerry kept track of how many cookies she ate each day using addition signs.



Term Number (Day)			
Term Value (Cookies)			

2) Ally writes down how many days it was sunny each month from June - November.



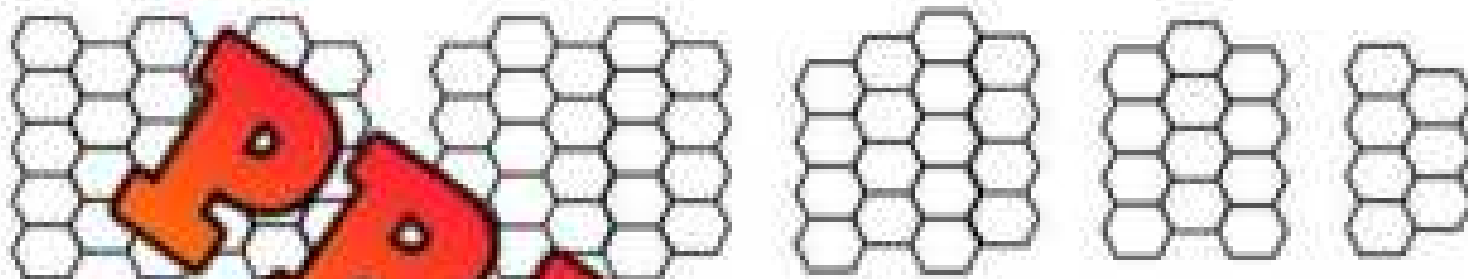
Term Number (Month)									
Term Value (Sunny Days)									

## Decreasing Pattern Challenge

### Questions

Answer the questions below using a table of values and a graph.

Jill makes a pattern using hexagons. Translate the pattern using the graph and table of values.



Term Number	Term



- 1) What is the pattern decreasing by each time?
- 2) Draw your own decreasing pattern below

# Exit Cards

**Cut Out**

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

Name: \_\_\_\_\_

Answer the questions below by using the table of values.

When you complete a math worksheet, you earn 2 points. Fill in the table below to learn more about your point collection.

# of Worksheets	Points Earned
2	
4	
6	
8	
10	

Name: \_\_\_\_\_

Answer the questions below by using the table of values.

When you complete a math worksheet, you earn 8 points. Fill in the table below to learn more about your point collection.

# of Worksheets	Points Earned
2	
4	
6	
8	
10	

Name: \_\_\_\_\_

Answer the questions below by using the table of values.

When you complete a math worksheet, you earn 8 points. Fill in the table below to learn more about your point collection.

# of Worksheets	Points Earned
2	
4	
6	
8	
10	

Name: \_\_\_\_\_

Answer the questions below by using the table of values.

When you complete a math worksheet, you earn 8 points. Fill in the table below to learn more about your point collection.

# of Worksheets	Points Earned
2	
4	
6	
8	
10	

## Toothpick Linear Patterns

A linear pattern is a pattern that increases or decreases 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.



- 1) Why is this a linear pattern?
  
- 2) Extend the line on the graph. What will be the 7<sup>th</sup> and 10<sup>th</sup> term value?

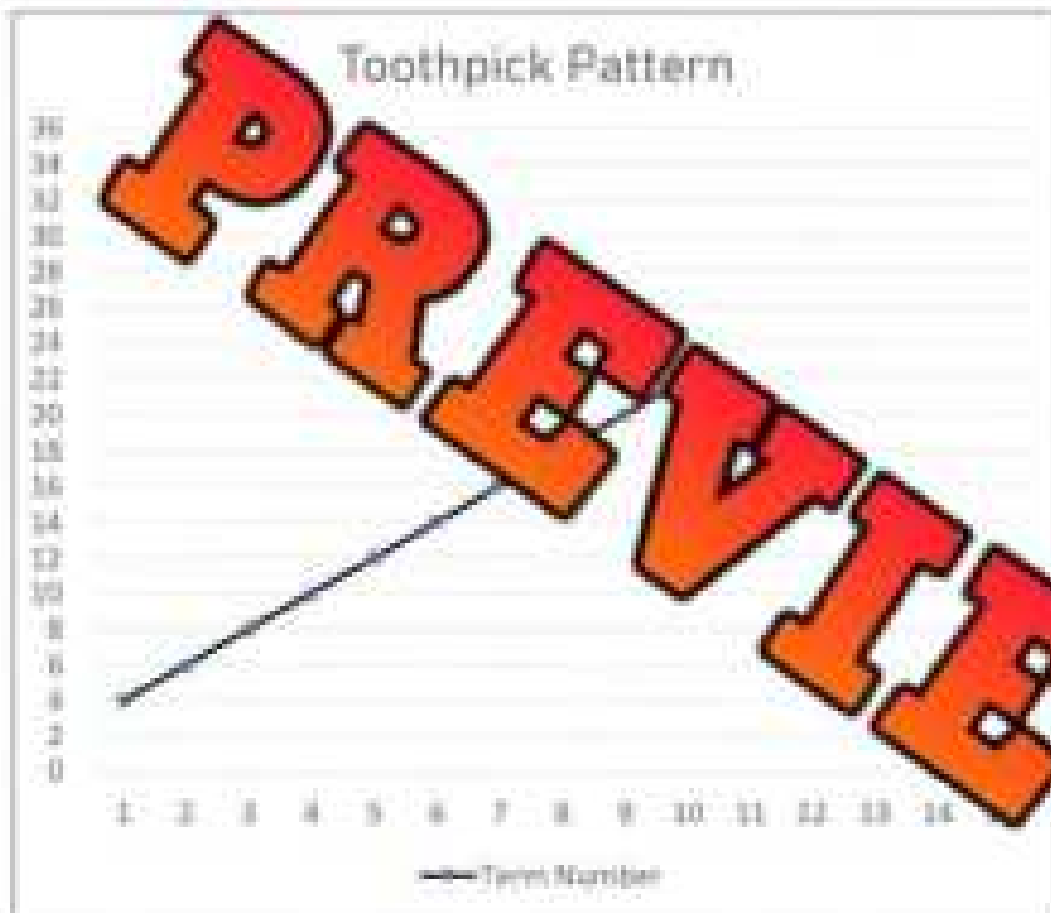
7<sup>th</sup> term \_\_\_\_\_ 10<sup>th</sup> term \_\_\_\_\_

## Reading a Linear Pattern - Graph

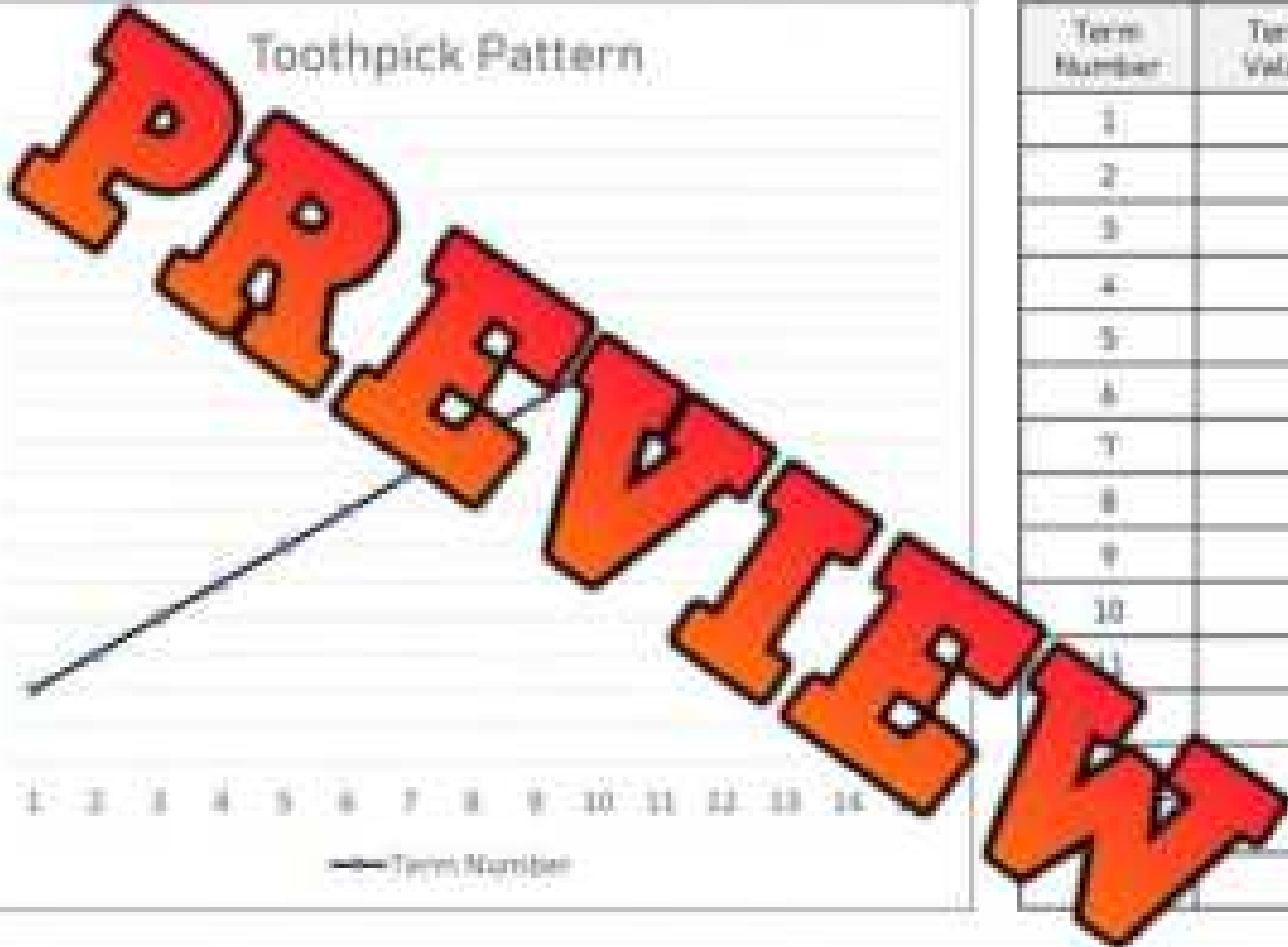
A linear pattern is a pattern that increases or decreases by a value that remains the same. Linear patterns can be plotted as a straight line on a graph.

### Instruction

Continue the line on the graph and fill in the table of values.



Term Number	Term Value
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	



1) Draw the toothpick pattern below for the graph/table of values. Use any design you'd like.

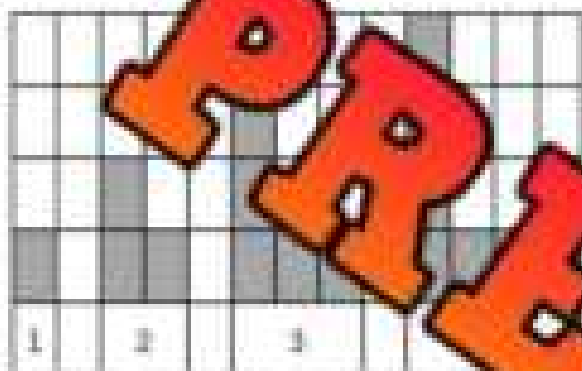
<input type="checkbox"/>				
Term 1	Term 2	Term 3	Term 4	Term 5

2) Why is this graph a linear pattern?

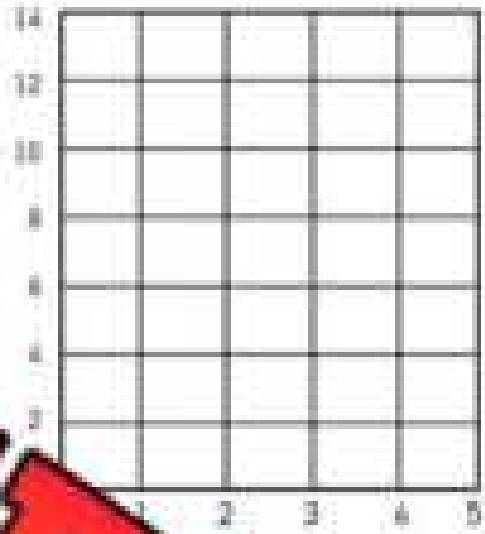
# Linear and Non-Linear Patterns

Not all patterns are linear. Some patterns increase/decrease by the same amount each time, while others grow/shrink at different rates. When the pattern grows or shrinks by different amounts, it is called **non-linear**.

**Instruction:** Look at the patterns below and fill in the table of values. Then complete the graph. Is the line straight?



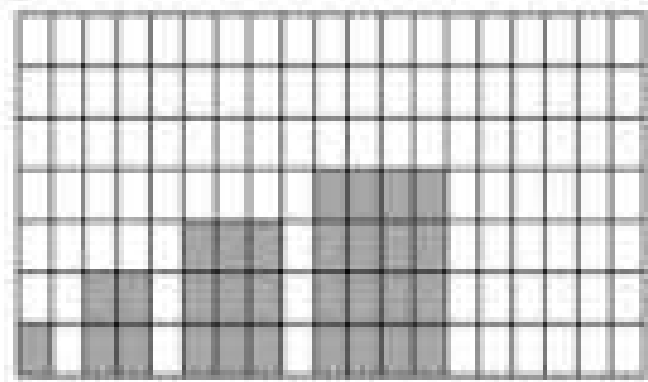
Term Number	Term Value
1	
2	
3	
4	
5	



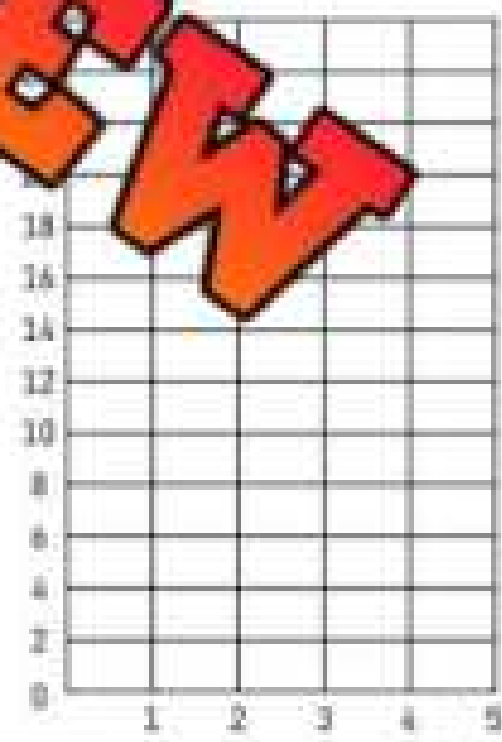
1) Is this pattern linear or non-linear? Explain.

\_\_\_\_\_

\_\_\_\_\_



Term Number	Term Value
1	
2	
3	
4	
5	



2) Is this pattern linear or non-linear? Explain.

\_\_\_\_\_

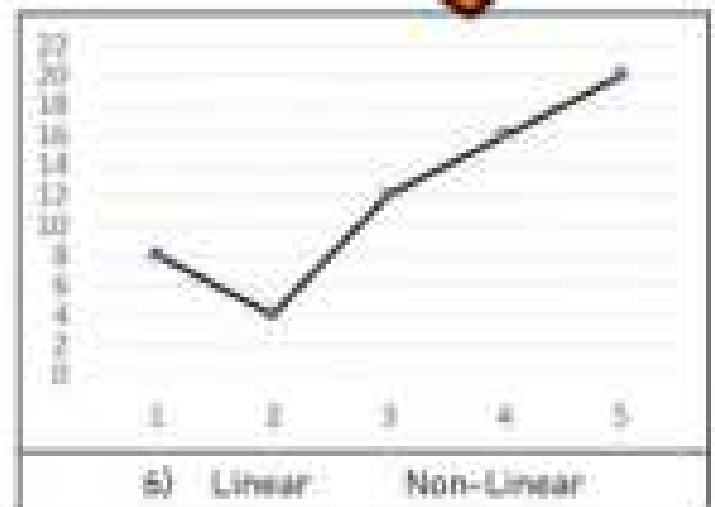
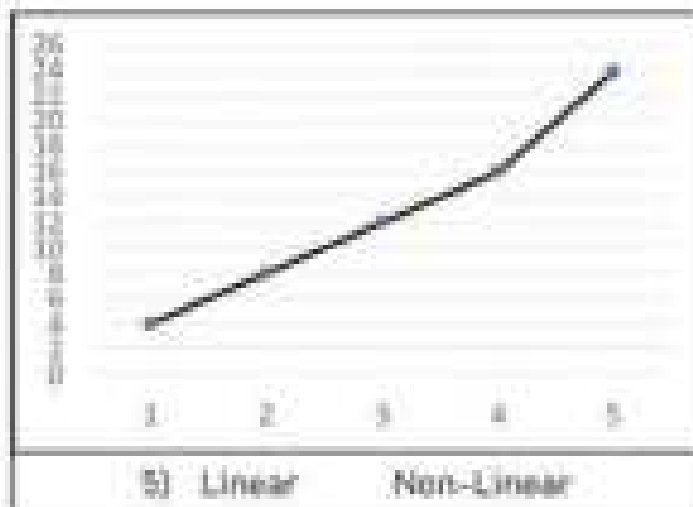
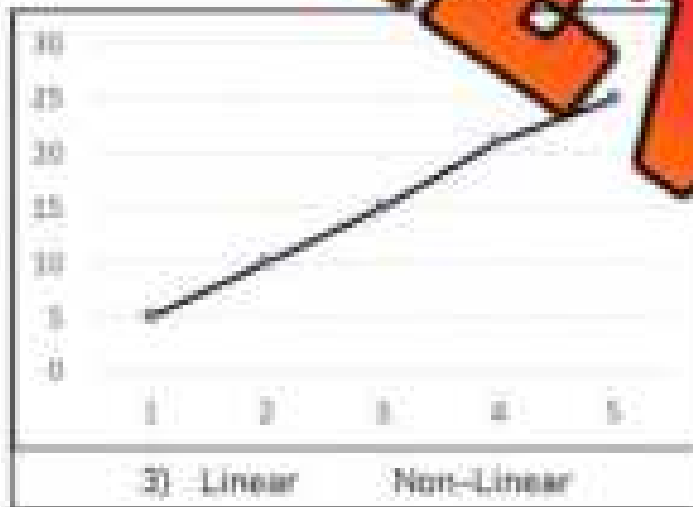
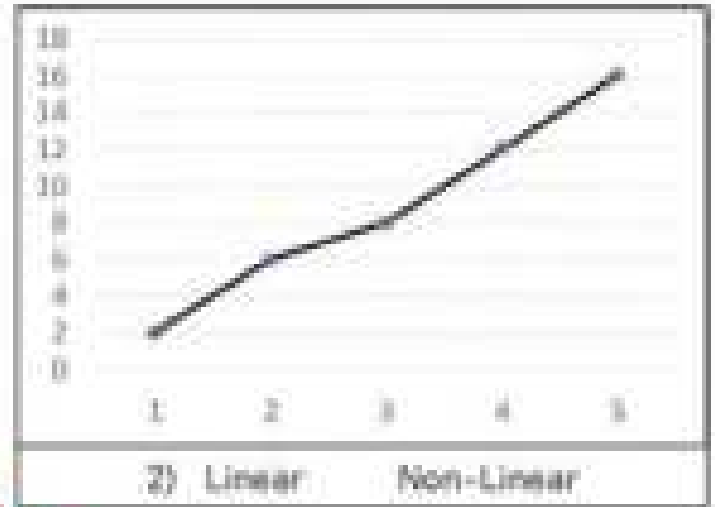
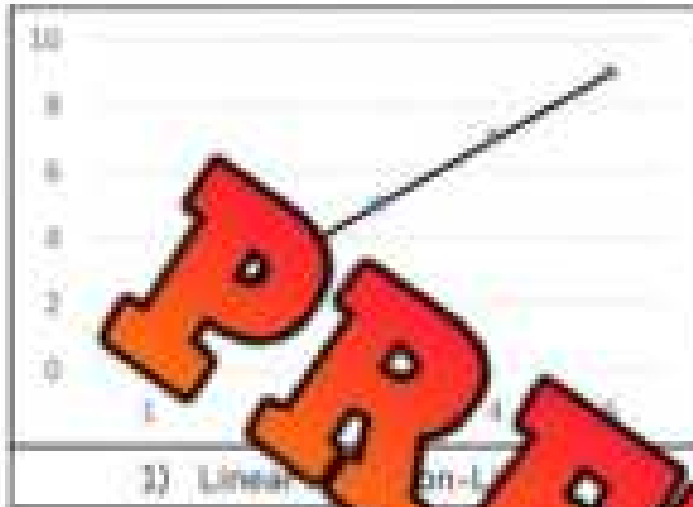
\_\_\_\_\_

3) How many blocks would be in term number 10? \_\_\_\_\_

# Increasing Linear Patterns – Yes or No?

## Questions

Circle if the pattern displayed on the graph is linear or not



**PREVIEW**

## Increasing Linear Patterns – Yes or No?

### Questions

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

Term Number	Term Value	Term Number	Term Value	Term Number	Term Value
1	2	1	10	1	15
2	6	2	16	2	18
3	10	3	20	3	21
4	14	4	26	4	25
5	18	5	32	5	28
Linear	Non-Linear	Linear	Non-Linear	Linear	Non-Linear








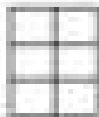







Term Number	Term Value	Term Number	Term Value	Term Number	Term Value
1	14	1	25	1	25
2	19	2	50	2	75
3	24	3	75	3	125
4	29	4	100	4	175
5	34	5	125	5	225
Linear	Non-Linear	Linear	Non-Linear	Linear	Non-Linear

Term Number	Term Value	Term Number	Term Value	Term Number	Term Value
1	112	1	210	1	500
2	126	2	260	2	650
3	138	3	310	3	700
4	152	4	360	4	850
5	166	5	410	5	1000
Linear	Non-Linear	Linear	Non-Linear	Linear	Non-Linear

# T-Tables – Finding Patterns

**Questions**

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

<p>1)   </p> <p>Figure 1                      Figure 2                      Figure 3</p>			<p><b>Figure</b></p> <p>1</p> <p>2</p> <p>3</p> <p>4</p>	<p><b>Lines</b></p> <p>7</p>
<p>2)   </p> <p>Figure 1                      Figure 2                      Figure 3</p>			<p><b>Figure</b></p> <p>1</p> <p>2</p> <p>3</p> <p>5</p>	<p><b>Lines</b></p>
<p>3)   </p> <p>Figure 1                      Figure 2                      Figure 3</p>			<p><b>Figure</b></p> <p>3</p> <p>6</p>	<p><b>Lines</b></p>
<p>4)   </p> <p>Figure 1                      Figure 2                      Figure 3</p>			<p><b>Figure</b></p> <p>1</p> <p>2</p> <p>3</p> <p>8</p>	<p><b>Lines</b></p>
<p>5)   </p> <p>Figure 1                      Figure 2                      Figure 3</p>			<p><b>Figure</b></p> <p>1</p> <p>2</p> <p>3</p> <p>10</p>	<p><b>Lines</b></p>


PREVIEW

# Exit Cards

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

Name: \_\_\_\_\_

a) Draw the next figure.



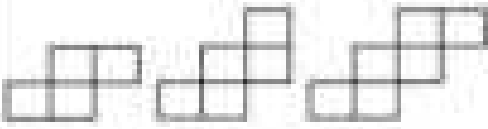
b) Write the algebraic expression

c) Write the number of lines that represents the figure sequence.

Figure	Lines
1	_____
4	_____
8	_____

Name: \_\_\_\_\_

a) Draw the next figure.



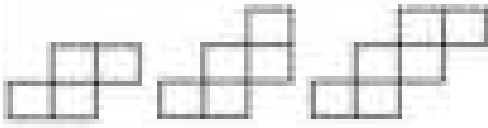
b) Write the algebraic expression

c) Write the number of lines that represents the figure sequence.

Figure	Lines
1	_____
4	_____
8	_____

Name: \_\_\_\_\_

a) Draw the next figure.



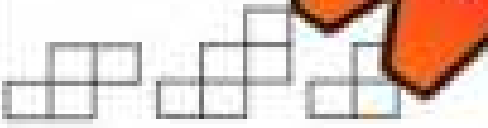
b) Write the algebraic expression

c) Write the number of lines that represents the figure sequence.

Figure	Lines
1	_____
4	_____
8	_____

Name: \_\_\_\_\_

a) Draw the next figure.



b) Write the algebraic expression

c) Write the number of lines that represents the figure sequence.

Figure	Lines
1	_____
4	_____
8	_____

PREVIEW

# 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 had different design ideas. Fill in the tables below.

Phase	Blocks
1	
2	
3	
4	22
5	

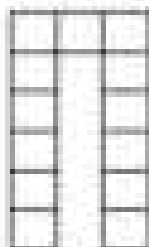
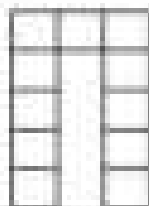
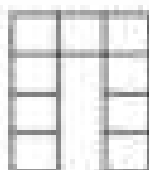
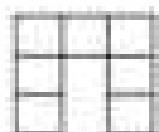
Phases	Blocks
1	
2	12
3	
4	
5	27

Phases	Blocks
1	8
2	
3	
4	
5	36

- b) Whoops, Matt made a mistake when he completed Phase 5. His structure was supposed to add the same number of blocks each phase. Find his error and correct it.

Phases	1	2	3	4
Blocks	12	17	21	

- c) You want to build a house out of blocks, but each block costs \$5. You have created 4 different design plans. You have \$70 to spend. Which design will you choose?



Design	Blocks	\$
1		
2		
3		
4		

## Table of Values – Finding Term N

When finding a random term in a pattern, we can use a variable. Often  $n$  is used to take the place of the term number. When we use  $n$ , we can change the value to find the term value for any term number.

We can find the value for  $n$  by looking at the pattern between the term number and term value. To do this, we look across the table from the term number to the term value.

**Practice** Find the pattern rule when you look across the table of values.

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

$$n + 2$$

Term Number	Term Value
1	3
2	5
3	7
4	9
5	11
6	13
9	

$$n \times 2 + 1 \text{ or } 2n + 1$$

Term Number	Term Value
1	5
2	10
3	15
4	20
5	25
6	
8	

Term Number	Term Value
1	4
2	7
3	10
4	13
5	16
6	
11	

Term Number	Term Value
1	4
2	6
3	8
4	10
5	12
6	
11	

Term Number	Term Value
10	4
15	9
20	14
25	19
30	24
35	
50	

## Table of Values – Finding Term N

### Practice

Find the pattern rule when you look across the table of values.

Term Number	Term Value
1	8
2	13
3	17
4	22
5	27
6	32

Term Number	Term Value
1	14
2	15
3	16
4	17
5	18

Term Number	Term Value
1	9
2	19
3	29
4	39
5	49
11	

Term Number	Term Value
1	7
2	11
3	15
4	19
5	23
11	

Term Number	Term Value
1	14
2	15
3	16
4	17
5	18
11	

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

### Word Problem

Use a table of values and find the  $n^{\text{th}}$  term.

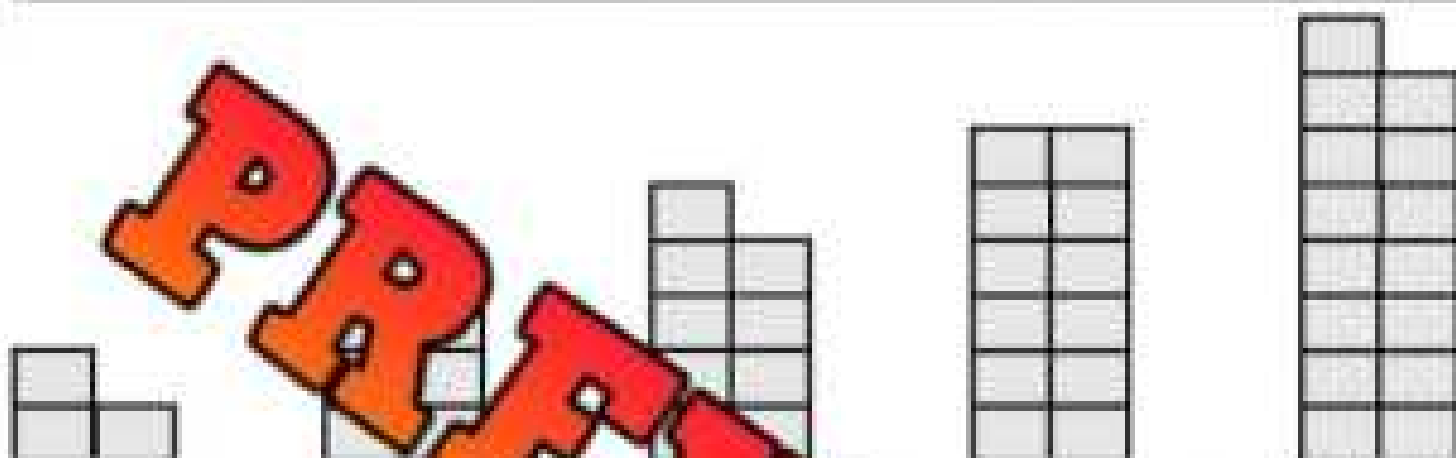
Joe goes out looking for shells on a beach. He records how many shells he finds each day. He found 10 shells the first day, 20 shells the second day, 30 the third day, and 40 the fourth day. How many will he find on the 30th day if the pattern continues.

## Growing Pattern Challenge

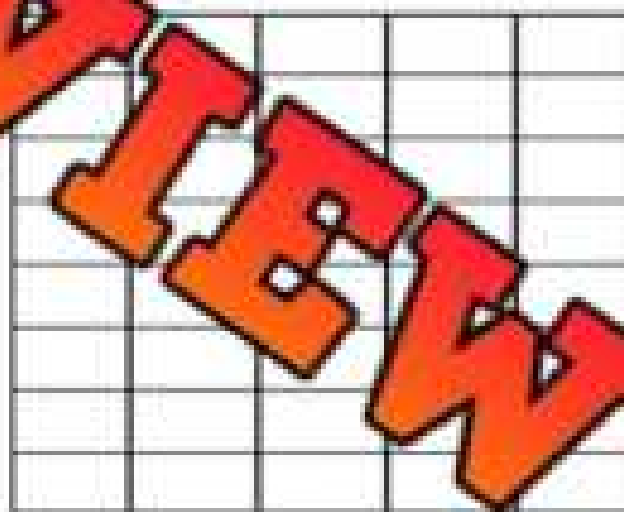
**Questions**

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 10<sup>th</sup> shape if he continued his pattern?

2) Write an expression that represents the function

3) Which shape would use 63 blocks?

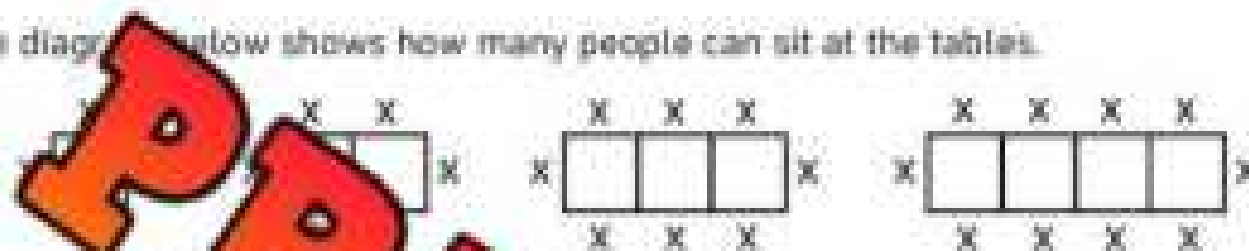
## Picnic Word Problem – T-Tables

### 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-table below with the pattern of how many people can attend the banquet.

Tables	1	2	3	4	5
# of Seats					

b) Write an algebraic expression that represents the pattern.

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?

# Basketball Skills Challenge

## Instructions

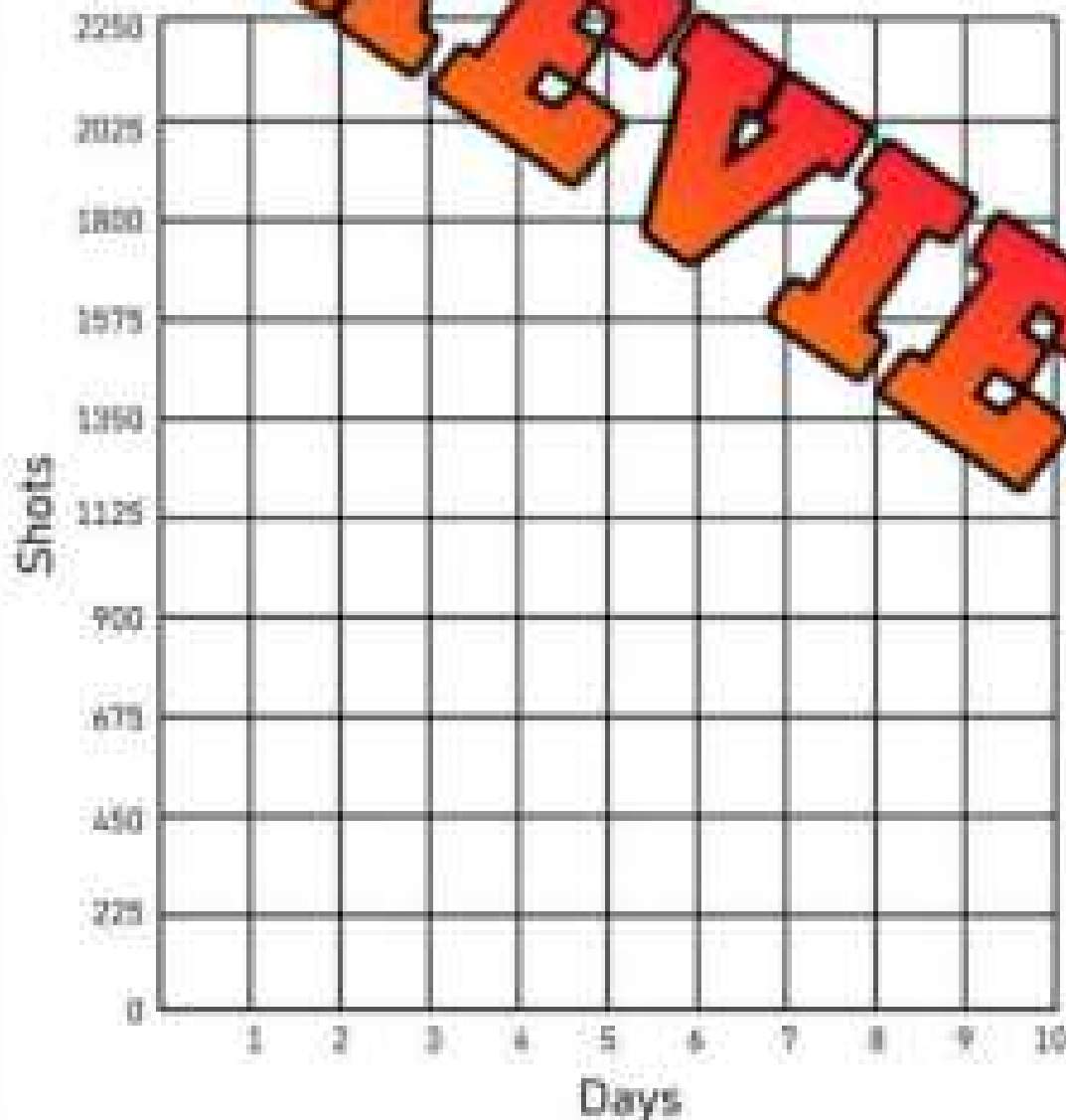
Complete the table of values and graph the results.



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

Term Number (Day)	1	2	3	4	5	6	7	8	9	10
Term										

Function	pr



## Questions

1. Which day did Connor finish 1500 shots?

2. How many shots would Connor take in 7 days?

3. If his friend took 300 shots for 7 days, who would have taken more? Explain.

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# Algebra Quiz - Patterning

## Part 1

Continue the pattern and circle the pattern core.

1) 

2) 

3) 


## Part 2


Draw patterns using shapes, numbers, or letters.

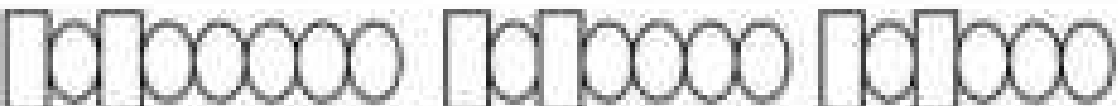
1)	A	B	A	A	B	B
Translated						
2)	A	B	C	A	C	C
Translated						

## Part 3

Continue the growing and shrinking patterns below.

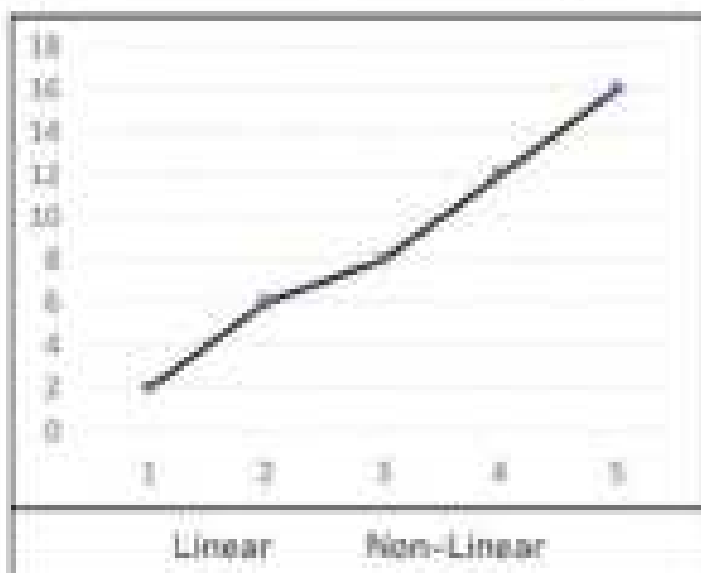
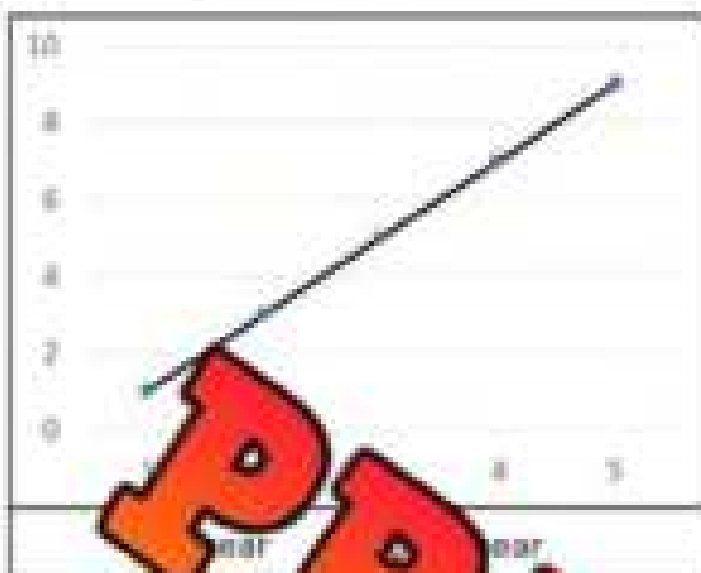
1) 

2) 

3) 

**Part 4**

Circle if the pattern displayed on the graph is linear or not



**Part 5**

Circle if the pattern in the tables below

**Subtract by**

In	Out
41	
83	
	104
	124

**Rule: Add 13**

In	Out
14	

**Rule: Divide by 2**

In	Out
215	
233	
268	
291	

**Rule: Multiply by 5**

In	Out
7	
13	
	105
	145

**PREVIEW**

Steven wants to buy a new gaming system that is on sale for \$386. The sale will end in 6 days. He has \$50 saved already and can make \$8 an hour for cutting grass.

- a) How much more money does he need to have enough to buy the gaming system?
- b) How many hours does he need to work to save enough money to buy the gaming system?
- c) How many hours should he work each day to ensure he can buy the gaming system within the next 6 days?
- d) He can cut 2 yards in each hour. How many yards will he need to cut to have enough money?
- e) Steven's parents decided to give him \$120 extra dollars for his gaming system. How many hours will he need to work now?

**PREVIEW**

**Grade 6**  
**C2. Equations and Inequalities**

	<b>Curriculum Expectations</b>	<b>Pages That Cover the Expectations</b>
<b>C2.1</b>	add monomials with a degree of 1 that involve whole numbers, using tools	158 - 159
<b>C2.2</b>	evaluate algebraic expressions that involve whole numbers and decimal tenths	150, 154 - 157
<b>C2.3</b>	solve equations that involve multiple terms and whole numbers in various contexts, and verify solutions	82 - 149, 151 - 153
<b>C2.4</b>	solve inequalities that involve two operations and whole numbers up to 100, and verify and graph the solutions	161 - 173

**Addition – Are They Equal?**

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

$8 + 4 = 12$

$23 + 15 = 36$

$47 + 13 = 50$

**Instructions:**

Put a slash through the equal sign (=) if it is not balanced

1) $12 + 3 = 15$	2) $43 + 10 = 63$	3) $41 + 13 = 55$
4) $58 + 12 = 60$	5) $45 + 32 = 77$	6) $82 + 15 = 98$
7) $92 + 5 = 97$	8) $105 + 13 = 118$	9) $114 + 7 = 122$
10) $125 + 15 = 150$	11) $137 + 11 = 149$	12) $146 + 8 = 154$
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) $255 + 40 = 285$

**PREVIEW**

# Pre-Algebra – Balancing Addition Equations

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

Examples:

$$\begin{array}{c} 52 \\ \swarrow \quad \searrow \\ 37 + 15 = \boxed{52} \end{array}$$

$$\begin{array}{c} 78 \\ \swarrow \quad \searrow \\ 46 + 32 = \boxed{78} \end{array}$$

Instructions:

Fill in the missing number to balance the equation.

1)  $45 + \square = 60$

2)  $53 + 9 = \square$

3)  $67 + 12 = \square$

4)  $15 + \square = 30$

5)  $28 + \square = 57$

6)  $68 + \square = 81$

7)  $\square + 12 = 95$

8)  $\square + 25 = \square + 59 = 66$

10)  $72 + 14 = \square$

11)  $64 + \square = 80$

9)  $\square + 15 = 75$

13)  $68 + \square = 82$

14)  $83 + 15 = \square$

15)  $89 + \square = 102$

16)  $105 + \square = 118$

17)  $121 + 14 = \square$

18)  $145 + \square = 160$

19)  $177 + \square = 198$

20)  $215 + 41 = \square$

21)  $217 + \square = 229$

**Activity – Math Hot Seat: Addition Challenge****Objective**

What are we learning about?

Students will practice solving addition problems to find unknown values by participating in a fun and interactive game, enhancing their arithmetic skills and quick thinking.

$$X+10=25$$

**Material**

What you will need for the activity

- Index cards with math problems
- Chairs arranged in a circle
- Stopwatch
- Whiteboard and markers

**Instructions**

How you will complete

1. Prepare a stack of index cards with various addition problems. Ensure some problems require finding a missing number.
2. Arrange chairs in a circle with one "hot seat" chair.
3. Explain the rules of the game to the students. One student sits in the hot seat while the rest sit in the surrounding chairs.
4. The teacher will read an addition problem from the stack. The student in the hot seat has a limited time (e.g., 30 seconds) to solve the problem.
5. If the student in the hot seat answers correctly within the time limit, they stay in the hot seat for the next round. If they answer incorrectly or run out of time, they switch places with another student from the circle.
6. Continue the game until each student has had the opportunity to sit in the hot seat multiple times, or until the designated game time is up.
7. Keep track of the number of correct answers each student provides while in the hot seat. The student with the most correct answers at the end of the game wins.

The pet store sold 19 dogs and 13 cats. What was the total number of animals sold?

$$78 + a = 135$$

$$p + 32 = 96$$

$$58 + q = 112$$

The school choir performed at 3 different events. At the first event, they sang 27 songs. At the second event, they sang 19 songs. At the third event, they sang 14 songs. What was the total number of songs the choir sang?

$$28 + r + 14 = 87$$

$$y + 36 + 19 = 104$$

$$42 + z - 16 = 75$$

$$a + 63 - 27 = 91$$

The school library had 84 fiction books and 57 non-fiction books. They received 23 more fiction books and 18 more non-fiction books. How many books does the library have now?

$$70 + b = 150$$

$$79 + c + 17 = 115$$

$$d + 16 + 29 = 75$$

The art classroom had 62 colored pencils and 19 markers. They received 31 more colored pencils and 24 more markers. How many colored pencils and markers does the classroom have now?

$$e + 72 - 19 = 118$$

$$93 + f + 11 = 159$$

$$g + 54 - 23 = 86$$

$$h + 82 + 21 = 139$$

$$115 + i - 43 = 172$$

$$j + 39 + 28 = 102$$

The school band had 75 trumpets and 54 trombones. They received 29 more trumpets and 18 more trombones. How many instruments do they have now?

$$k + 67 - 31 = 124$$

$$131 + l + 22 = 203$$

## 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 **commutative 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.

**Instructions:** Write 2 equations for the orders below



#	Fries (f)	Burgers (b)	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		

## 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).

### Instructions

Write the equation and find the answer.



#	Customer's Order (\$)	Equation	Answer
1	$s = 9$	$c = g + b + s$ $c = 5 + 8 + 9$	22
2	$g = 7$	_____	
3	$g = 7$ $s = 15$	_____	
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	$g = 38$ $s = 24$	_____	

PREVIEW

# Word Problems – Writing Addition Equations

## Instructions

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 and Harry made \$75 together at work. Bruce can't remember how much he made but Harry made \$39. Which equation will tell us how much Bruce made?

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



3) Mary and Brianna found 121 Easter eggs together. Mary found 65. Which equation will tell us how many Brianna found?



$121 + b = 65$	$65 + b = 121$
$b + 65 = 121$	$121 + b = 65$

4) Brad scored 38 points in a basketball game. He had 12 points in the second half. Which equation will tell us how many points he had in the first half?

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



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) Tim drove 138km to get to work. Then he drove to the store. When he got to the store, he had driven 195 km in total. How many km did he drive to the store ( $s$ )?



2) Steve got 25 points for beating level 1 in a video game. He got 68 more points for level 2. How many total points ( $t$ ) did he have after level 2?

**Bonus** – He got 100 points for beating level 3. How many points did he get in level 3 ( $L$ )?



3) The Lakers scored 122 total points against the Toronto Raptors. Kobe Bryant had 81 points for the Lakers. How many points did the rest of the team have?



4) Jessica's boat can hold a whopping 200 litres of gas. She was out for a full tank. When she docked the boat after she was done, the tank only had 75 litres left. How many litres ( $l$ ) did she use?



5) Becca had \$187 in her bank account. She deposited some more money after she babysat for a summer. Now she has \$410. How much money ( $m$ ) did she make babysitting?



## Math Basketball: Addition Equations Challenge

### Objective

What are we learning about?

To reinforce students' understanding and application of addition through engaging word problems and a fun basketball shooting game.



### Materials

What you will need for the activity

- 20 recycled paper balls
- Trash can (or a bucket) as the hoop
- Index cards with addition word problems
- Marker or pencil
- Timer or stopwatch

### Instructions

How you will complete

1. Divide the class into small groups of four to five students.
2. Set up each group behind a desk with a student holding a recording sheet, several recycled paper balls, and a trash can or bucket set away.
3. Have each group line up behind their desk.
4. When the teacher says "go," the first student in each group picks a word problem and writes the answer on the recording sheet.
5. After answering, the student shoots a paper ball into the trash can.
6. They record whether their shot was a basket or not on the sheet.
7. Then the next person in line repeats the process.
8. Continue until all questions have been answered.
9. After the activity, the class goes over the correct answers together.
10. Each group earns one point for every correct answer and one point for each successful basket.
11. The team with the most total points wins the game.

## Index Cards

Use the following table for the game.

1	Maria has 24 apples in total. She picked 10 apples from one tree and 8 apples from another. How many apples did she pick from the third tree (a)?
2	Jason collected 50 marbles in total. He found 20 marbles in the park and 15 marbles at home. How many marbles did he find at school (m)?
3	Emily read 90 pages of her book in total. She read 40 pages on Monday and 30 pages on Tuesday. How many pages did she read on Wednesday (p)?
4	Michael has 75 toy cars in total. He received 20 toy cars for his birthday and 25 toy cars from his friends. How many toy cars did he already have (c)?
5	Sarah saw 50 birds in total. She saw 20 sparrows and 15 robins. How many pigeons did she see (h)?
6	Liam built 100 Lego structures in total. He built 30 houses and 40 cars. How many towers did he build (t)?
7	Olivia has 25 books. She has 10 novels and 5 comic books. How many picture books does she have (p)?
8	Noah drew 75 pictures in total. He drew 30 landscape pictures and 20 animal pictures. How many animal pictures did he draw (a)?
9	Ava has 10 school supplies. She has 5 pencils and 2 pens. How many erasers does she have (e)?
10	James collected 200 stamps in total. He collected 120 stamps from his travels and 50 stamps from friends. How many stamps did he buy (s)?
11	Mia baked 80 cookies. She baked 30 chocolate chip cookies and 20 oatmeal cookies. How many sugar cookies did she bake (c)?
12	Ethan has 150 toy soldiers in total. He has 70 green soldiers and 50 red soldiers. How many blue soldiers does he have (b)?

## Index Cards

Use the following table for the game.

13	Emma has 40 stickers in total. She received 15 stickers from her friend and 10 stickers from her teacher. How many stickers did she already have (s)?
14	Lucas collected 100 seashells in total. He found 40 seashells on the beach and 35 seashells in the sand. How many seashells did he find in the water (t)?
15	Olivia built 60 sandcastles in total. She built 20 sandcastles on Monday and 30 sandcastles on Tuesday. How many sandcastles did she build on Wednesday (u)?
16	Jack has 80 toy trains in total. He got 10 toy trains for Christmas and 12 toy trains for his birthday. How many toy trains did he already have (t)?
17	Ella saw 70 animals in the zoo. She saw 25 monkeys and 20 lions. How many giraffes did she see (a)?
18	Ryan has 90 blocks. He has 30 red blocks and 40 blue blocks. How many green blocks does he have (b)?
19	Lily has 50 crayons. She has 20 red crayons and 15 orange crayons. How many yellow crayons does she have (c)?
20	Oliver drew 80 pictures in total. He drew 30 animals and 20 cars. How many houses did he draw (h)?
21	Chloe has 20 balloons. She has 8 red balloons and 5 blue balloons. How many yellow balloons does she have (b)?
22	Mason collected 120 baseball cards in total. He got 50 cards from his dad and 40 cards from his friend. How many cards did he already have (c)?
23	Grace read 150 pages in total. She read 60 pages in the morning and 50 pages in the afternoon. How many pages did she read at night (p)?
24	Benjamin has 70 cars. He has 30 toy cars and 25 model cars. How many remote control cars does he have (r)?

Name: \_\_\_\_\_

100

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## Recording Sheet

### Instructions

Write your answers below

1	
2	
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**PREVIEW**

### Tally Chart

Record your made baskets by adding a tally for each make

Number of Correct Answers	
Number of Made Baskets	
Total Score	

**Subtraction – Are They Equal?**

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

$16 - 8 = 8$

$95 - 11 = 86$

$105 - 12 = 93$

**Instructions!**

Put a slash through the equal sign (=) if it is not balanced

1) $23 - 6 = 17$	2) $46 - 4 = 42$	3) $57 - 6 = 51$
4) $68 - 10 = 57$	5) $82 - 25 = 57$	6) $75 - 13 = 63$
7) $84 - 14 = 70$	8) $92 - 16 = 76$	9) $108 - 12 = 95$
10) $135 - 15 = 110$	11) $126 - 20 = 109$	12) $143 - 27 = 116$
13) $168 - 22 = 144$	14) $174 - 13 = 161$	15) $157 - 16 = 142$
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**

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

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

**Instructions:** Fill in the missing number to balance the equation

1)  $36 - 2 = \square$

2)  $53 - 7 = \square$

3)  $44 - 5 = \square$

4)  $58 - \square = 45$

5)  $\square - 2 = 39$

6)  $65 - \square = 55$

7)  $\square - 5 = 52$

8)  $\square - 3 = \square - 7 = 71$

10)  $83 - 11 = \square$

11)  $91 - \square = 75$

13)  $105 - \square = 99$

14)  $112 - 9 = \square$

15)  $122 - \square = 111$

16)  $132 - \square = 119$

17)  $146 - 15 = \square$

18)  $158 - \square = 136$

19)  $173 - \square = 164$

20)  $185 - 17 = \square$

21)  $197 - \square = 182$

## 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,  $n = 14$ .



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

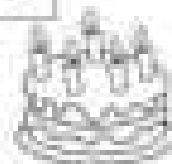
1) $39 - n = 25$ $n =$	2) $n - 15 = 20$ $n =$	3) $47 - n = 35$ $n =$
4) $68 - 16 = p$ $p =$	5) $45 - p = 53$ $p =$	6) $p - 16 = 50$ $p =$
7) $76 - y = 61$ $y =$	8) $87 - y = 72$ $y =$	9) $92 - 13 = y$ $y =$
10) $105 - t = 91$ $t =$	11) $114 - t = 101$ $t =$	12) $121 - t = 119$ $t =$
13) $153 - a = 137$ $a =$	14) $168 - a = 145$ $a =$	15) $176 - a = 159$ $a =$

### 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,  $c = m - p$

$m = 20$ $p = 15$	$c = 20 - 15$	$c = 5$	$m = 60$ $p = 51$	$c = \underline{\quad} - \underline{\quad}$	$c =$
$m = 30$ $p = 19$	$c = \underline{\quad} - \underline{\quad}$	$c =$	$m = 100$ $p = 77$	$c = \underline{\quad} - \underline{\quad}$	$c =$
$m = 50$ $p = 27$	$c = \underline{\quad} - \underline{\quad}$	$c =$	$m = 100$ $p = 61$	$c = \underline{\quad} - \underline{\quad}$	$c =$

## 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) $7.2 - n = 0$	5) $9.1 - p = 7$ $p =$	6) $12.1 - r = 10.5$ $r =$
7) $16.3 - n = 10.1$ $n =$	8) $n - 3.5 = 11.5$ $n =$	9) $t - 4.4 = 15$ $t =$
10) $22.7 - n = 20.1$ $n =$	11) $5.2 - t = 2.1$ $t =$	12) $34.6 - 6 = p$ $p =$
13) $47.6 - n = 44.4$ $n =$	14) $58.8 - 4 = 4$ $n =$	15) $67.2 - s = 62.4$ $s =$
16) $75.5 - s = 71.4$ $s =$	17) $88.4 - 2.3 = s$ $s =$	18) $7.2 - 2.3 = s$ $s =$

PREVIEW

### Word Problem

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 ( $p$ ).



### Instructions

Write the equations and find the answer.

#	P	Baked Goods	Equation	Answer
1	50	32	$c = p - g$ $c = 50 - 32$	$c = 18$
2	80		_____	
3	100	72	_____	
4	120	103	_____	
5	100	86	_____	
6	150	94	_____	
7	200	118	_____	
8	150	137	_____	

PREVIEW

## 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) Sarah is doing a running challenge. She needs to run 42km in 5 days. It is the last day and she has 8km left to run. Which equation will tell us how many km she has run in the first 4 days?

$$42 - r = 8$$

$$8 - r = 42$$

$$42 - 8 = r$$

$$r - 8 = 42$$



3) Tom collected 142 shells on the beach. He gave 94 shells to his sister. Now he has 94 shells left. Which equation tells us how many shells he gave to his sister?

$$142 - 94 = s$$

$$142 - s = 94$$

$$s - 94 = 142$$

$$s - 94 = 142$$



4) Courtney saved 125 dollars to buy new shoes. She now has 45 dollars left. Which equation tells us how much the shoes cost?

$$s - 45 = 125$$

$$125 - 45 = s$$

$$45 + s = 125$$

$$125 - s = 45$$



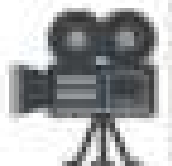
5) The movie is 118 minutes long. They have watched 31 minutes. Which equation tells us how many minutes are left?

$$m - 31 = 118$$

$$118 - 31 = m$$

$$31 + m = 118$$

$$31 - m = 118$$



## Word Problems – Solving Subtraction Equations

### Instructions

Solve the word problems using equations and variables

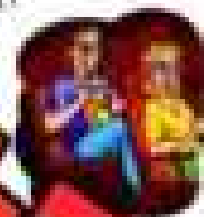
1) Bridgette started the weekend with \$214 in her bank account. She went shopping ( $s$ ) at the mall and now had \$76. How much did she spend at the mall?



2) Sarah found 100 eggs during her Easter egg hunt. She gave some to her friends and now has 35 eggs left. How many did she give ( $g$ ) away?



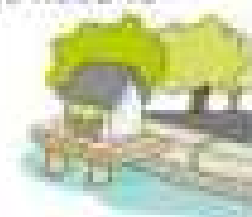
3) There are 128 minutes in a movie. Tom is watching it. He watches 41 minutes and then pauses the movie for popcorn. How many minutes ( $m$ ) are left?



4) Jeremy is climbing Mount Everest to Base Camp. It is 5,464 metres high. He has a break with 1,100m left. How many metres has he climbed ( $c$ ) already?



5) Pam is driving to her cottage in northern Alberta. The total distance is 721km. She has driven 315km 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:  $l = x - f - s$  or  $l = x - (f + s)$

$l = 1350 - 415 - 480$

$l = 455$ km. Therefore, Ron and his family have 455km remaining to drive.



2) The family goes to a restaurant for \$300 on dinner out for 3 nights. They spent \$75 on the first (f) dinner, and \$125 on the second (s) dinner. How much do they have left for the third dinner (t)?

Equation: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ Therefore, \_\_\_\_\_



3) The family heads to the waterside playground. They bring \$100 total (t). The two adults (a) cost \$25 each. The two kids (k) cost \$15 each. How much do they have left (l)?

Equation: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ Therefore, \_\_\_\_\_



4) The family buys a 24 pack of mini donuts (d). Ron (r) has 4 and he has 1 sister (s). The kids (k) eat 10 together. How many donuts are left (l)?

Equation: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ Therefore, \_\_\_\_\_



5) On the drive home, they take a short cut. The drive is 950km (d). They drive 380km the first day (f) and 430km the second (s) day. How many km do they have left (l)?

Equation: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ Therefore, \_\_\_\_\_



**Math Activity Title: Algebraic Bottle Flip Challenge****Objective**

What are we learning about?

To practice and reinforce understanding of basic one-step and two-step subtraction algebra problems through the engaging and physically active bottle flip game.

**Materials**

What you will need for the activity:

- Plastic bottles (one per pair/group) filled to approximately one-third with water (or plastic cups)
- Set of subtraction algebra cards
- Answer sheet for each group

**Instructions**

How you will do the activity:

1. Start with a short lesson on one-step and two-step subtraction problems, using examples like  $x - 3 = 4$ .
2. Arrange the students into pairs or small groups. Give each group a bottle and a set of question cards to each.
3. Each pair or group receives an answer sheet to record their answers.
4. Explain the rules: One student draws a question card and solves the subtraction algebra problem.
5. Once they believe they have the correct answer, they write it on the answer sheet.
6. The student then gets to attempt a bottle flip. After answering each question, the student gets only one flip. After they flip their bottle, they should keep track of successful flips and unsuccessful flips.
7. Alternate turns within each group or pair until they have completed all the question cards.
8. Groups or pairs tally their successful flips and compare with the rest of the class to determine the winning team (team with the most successful flips/correct answers). For incorrect answers, deduct a point from their successful bottle flips.
9. Go through the answer sheet with the class to ensure understanding and correct any misconceptions.
10. Discuss the strategies used to solve the subtraction problems and how this type of algebra is used in real-life situations.

## Questions

Cut out the questions below and use for the game

$x - 15 = 85$	$b - 20 = 50$	$200 - d - 10 = 167$	$190 - 30 - 54 = w$
$22 - g = 75$	$b - 33 = 67$	$180 - 25 - k = 110$	$e - 144 - 30 = 82$
$150 - 10 = p$	$50 - c = 100$	$170 - j - 30 = 98$	$193 - t - 40 = 122$
Dylan had 150 candies and gave some away. Now he has 25. How many did he give away?	Eva had 90 books and gave some away. Now she has 30. How many did she give away?	Sarah had 200 stickers, she gave 50 to one friend and 30 to another. How many stickers does she have left?	Sara set aside \$400 for school supplies. She spent \$90 on notebooks, \$125 on textbooks, and some amount on art supplies. She has \$125 left for pens and pencils. How much did she spend on art supplies?
Max had 150 marbles and lost some. Now he has 120. How many did he lose?	Ben had 200 pencils and gave some to his friends. Now he has 140. How many did he give away?	Jane had 100 books, she sold 20 and donated 80. How many books does she have left?	Emma saved \$500 for a vacation. She spent \$200 on a plane ticket, \$150 on accommodation, and some amount on food. She has \$100 left. How much did she spend on food?
Lily had 120 stickers and used some. Now she has 90. How many did she use?	Charlie had 180 toys and gave some to charity. Now he has 130. How many did he give away?	Mike had 250 coins, he spent 70 and lost 50. How many coins does he have left?	Jack set aside \$600 for a new computer. He spent \$300 on the computer, \$150 on accessories, and some amount on software. He has \$50 left. How much did he spend on software?

**PREVIEW**

**Algebraic Bottle Flip Challenge****Answers**

Record your answers below.

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24	

**PREVIEW**

## Pre-Algebra – Balancing Multiplication Equations

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

Examples:

$$\begin{array}{c} 24 \\ \wedge \\ 8 \times 3 = 24 \end{array}$$

$$\begin{array}{c} 42 \\ \wedge \\ 7 \times 6 = 42 \end{array}$$

Instructions:

Fill in the missing number to balance the equation

1) $6 \times \square = 18$	2) $5 \times 7 = \square$	3) $4 \times 5 = \square$
4) $8 \times \square = 16$	5) $\square \times 3 = 18$	6) $4 \times \square = 28$
7) $\square \times 5 = 25$	8) $\square \times 6 = 18$	9) $\square \times 3 = 18$
10) $9 \times 4 = \square$	11) $7 \times \square = 56$	12) $\square \times 4 = 20$
13) $3 \times \square = 33$	14) $10 \times 9 = \square$	15) $6 \times \square = 54$
16) $8 \times \square = 48$	17) $20 \times 3 = \square$	18) $4 \times \square = 44$
19) $12 \times \square = 48$	20) $14 \times 4 = \square$	21) $11 \times \square = 110$

## 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:  $7n = 14$  means  $7 \times n = 14$

We can figure out the unknown number by balancing the equation -  $n = 2$



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

1) $5n = 15$ $n =$	2) $n \times 8 = 16$ $n =$	3) $s \times 6 = 48$ $s =$
4) $10 \times 4 = p$ $p =$	5) $3 \times 7 = q$ $q =$	6) $6k = 18$ $k =$
7) $3n = 18$ $n =$	8) $4 \times 3 = r$ $r =$	9) $n \times 6 = 66$ $n =$
10) $5n = 25$ $n =$	11) $6 \times 4 = t$ $t =$	12) $8 \times 4 = p$ $p =$
13) $3n = 24$ $n =$	14) $10n = 100$ $n =$	15) $7c = 21$ $c =$
16) $9s = 27$ $s =$	17) $5 \times 8 = s$ $s =$	18) $3 \times 4 = t$ $t =$

### Part 2 Calculate the area using the variables for length and width

The formula for calculating area is:  $A = L \times W$

Calculate the area in the questions below using the values for the variables L and W

L = 5 W = 8	A =
L = 9 W = 7	A =
L = 6 W = 11	A =

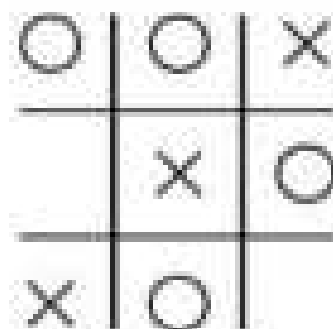
L = 4 W = 12	A =
L = 8 W = 5	A =
L = 3 W = 13	A =

## Math Tic-Tac-Toe: Solving Variables

### Objective

What are we learning about?

To help students practice solving subtraction equations involving variables in a fun and interactive way through a Tic-Tac-Toe game.



Materials: What you will need for the activity.

- Whiteboard or paper
- Markers (one for each team)
- Math Tic-Tac-Toe grid template (to be drawn on the whiteboard or printed on paper)

### Instructions

How you will complete it

1. Draw a large tic-tac-toe grid on the whiteboard. In each cell of the grid, write a subtraction equation involving variables (e.g.,  $5 - x = 7$ ). Divide the class into two teams: Team X and Team O.
2. Explain to the students that they will play tic-tac-toe. If a student places a mark (X or O) in a cell, they must first correctly solve the equation written in that cell.
3. Team X will go first. A student from Team X will choose a cell, come to the board, and solve the equation written in that cell. If they solve it correctly, they place an X in that cell.
4. If the student answers incorrectly, they do not place their mark, and it becomes Team O's turn. A student from Team O will then choose a cell, solve the equation, and place an O if correct.
5. Continue alternating turns between the two teams. The first team to get three marks in a row (horizontally, vertically, or diagonally) wins the game.
6. After the game, discuss the different strategies used to solve the equations and any challenges faced during the activity.

## Tic-Tac-Toe

Use the following tic-tac-toe grids for the game.

$5p = 40$	$6 \times 9 = g$	$7n = 21$
$8s = 64$	$3 \times 12 = f$	$4m = 28$
$9$		$10a = 20$

$7p = 35$	$5 \times 8 = w$	$6m = 36$
$9s = 63$	$4 \times 11 = c$	$8n = 56$
$2t = 14$	$3 \times 14 = z$	$10b = 80$

$4p = 28$	$6 \times 12 = 72$	$5 \times 20 = 100$
$8s = 72$	$3 \times 10 = m$	$7k = 42$
$9q = 54$	$2 \times 16 = v$	$10r = 90$

$3p = 21$	$7 \times 11 = q$	$6m = 18$
$5 \times 10 = 50$	$9 \times 9 = j$	$8n = 64$
$2k = 20$	$4 \times 15 = 60$	$10l = 100$

$2p = 14$	$5 \times 10 = d$	$7n = 49$
$9s = 81$	$3 \times 13 = e$	$4m = 32$
$8r = 40$	$6 \times 7 = y$	$10b = 70$

$6p = 30$	$4 \times 12 = t$	$9s = 27$
$5k = 25$	$3 \times 14 = r$	$7m = 21$
$8q = 64$	$2 \times 15 = b$	$10e = 50$

**PREVIEW**

## 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 –  $a = l \times w$



Option 1

$$a = 7 \times 3$$

$$a = 21\text{cm}^2$$

Option 2

$$a = 3 \times 7$$

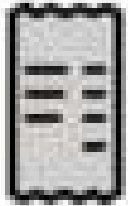
$$a = 21\text{cm}^2$$

**Question** Write two equations that represent the area of a rectangle

#	Length	Width	Equation 1	Equation 2
1	7m			
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	8		
4	3		
5	7		
6	9		
7	10		
8	5		

**Part 2** Amelia sells tickets to two different people in the same fraction

#	# 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

### Practice

Find the value of the variables below

1) $1.5n = 3$ $n =$	2) $n \times 2.5 = 5$ $n =$	3) $s \times 2.2 = 6.6$ $s =$
4) $2.1p = p$ $p =$	5) $5.3p = 15.9$ $p =$	6) $12.1r = 48.4$ $r =$
7) $1.3n =$ $n =$	8) $n \times 3.5 = 17.5$ $n =$	9) $t \times 4.4 = 22$ $t =$
10) $6.7n = 20.1$ $n =$	11) $1.1t =$ $t =$	12) $3.4 \times 2 = p$ $p =$
13) $7.6n = 38$ $n =$	14) $1.5n = 4.5$ $n =$	15) $10.1s = 50.5$ $s =$
16) $7.5s = 45$ $s =$	17) $4.2 \times 3 = s$ $s =$	18) $1.2 \times n =$ $n =$

### Word Problem

Solve the questions below

- Rylan has grown 32.5cm since she was born. She grew 6.5cm each year. How many years has she been alive?
- It rained 3.3mm every hour. In total, it rained 26.4mm. How many hours did it rain?



## Activity: Multiplication Race

**Objective**

What are we learning about?

Students will practice multiplication algebra questions by racing to solve equations quickly and accurately.

**Materials**

What you will need for the activity:

- Index cards
- Markers or pens
- Timer/stopwatch

**Instructions**

How to run the activity:

1. Prepare a stack of index cards with multiplication and one-step algebraic equation questions. Include a mix of problems for variety.
2. Have students line up in a single file.
3. Call the first two students in line to the front of the line to race to answer the multiplication algebraic equation question (Teacher pulls a card from the stack).
4. Pull a card from the stack and read the question aloud.
5. The first student to answer correctly wins the round. If a student gives the wrong answer, they are out and go to the end of the line.
6. The student who answers correctly stays at the front to compete against the next student in line.
7. The student who loses goes to the end of the line.
8. Optional: If a student wins five rounds in a row, they move to the back of the line to give others a chance to play.
9. Continue the game until all students have had a chance to compete multiple times or until the designated game time is up.

Name: \_\_\_\_\_

125

Multiplication Equations  
125

Multiplication Equations

Use these for the race

$5x = 25$

$4y = 16$

$3z = 9$

$2.5a = 10$

$7b = 49$

$0.5c = 1$

$6y = 36$

$1.5z = 3$

$8x = 40$

$5y = 11$

$2c = 20$

$10x = 50$

$3y = 15$

$6z = 18$

$4x = 12$

$2.2y = 11$

$5c = 3$

$1.5x = 7.5$

$9y = 27$

$5x = 45$

$7.5y = 15$

$3.5c = 7$

$2x = 10$

$6.5y = 13$

$8z = 32$

$0.6x = 3$

$5.2y = 10.4$

$2.5z = 5$

**PREVIEW**

# Pre-Algebra – Balancing Division Equations

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

Examples

$$25 \div 5 = \boxed{5}$$

$$18 \div \boxed{3} = 6$$

Instructions

Fill in the missing number to balance the equation

1)  $36 \div$

2)  $35 \div 7 =$

3)  $20 \div 5 =$

4)  $24 \div \square = 8$

5)  $30 \div \square = 3$

6)  $35 \div \square = 7$

7)  $\square \div 5 = 4$

8)  $\square \div 6 = 9$

9)  $\square \div 3 = 9$

10)  $36 \div 4 =$

11)  $56 \div \square = 8$

13)  $24 \div \square = 3$

14)  $99 \div 9 =$

15)  $64 \div \square = 8$

16)  $48 \div \square = 6$

17)  $20 \div 4 =$

18)  $48 \div \square = 12$

19)  $49 \div \square = 7$

20)  $36 \div 3 =$

21)  $72 \div 6 =$

## 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.

#		# of Staff (s)	Formula	Answer
1	16 donuts	8	$d \div s = t$	$16 \div 8 = 2$
2	12 cookies	3	$c \div s = t$	
3	20 muffins (m)	5		
4	16 slices of pizza (p)	4		
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		

PREVIEW

## 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:  $t = p \div b$

$t = 1000 \div$

$t = 50$  Therefore, Jonathon will have 50 bags of potatoes to sell.



2) Mr. Smith teaches 4 subjects ( $s$ ) for 140 minutes total ( $t$ ). If he teaches the 4 subjects equally, how many minutes ( $m$ ) will he teach each subject?

Equation: \_\_\_\_\_



3) A family with 2 brothers and a sister went on a hunt. The 4 kids ( $k$ ) find 240 easter eggs in total ( $t$ ). How many eggs ( $e$ ) did each kid find if they are split equally?

Equation: \_\_\_\_\_

\_\_\_\_\_

Therefore, \_\_\_\_\_

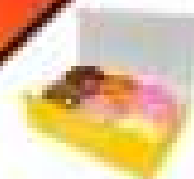


4) A family of 5 ( $f$ ) buys a pack of donuts. Each family member gets 3 donuts. How many donuts were there in total ( $t$ )?

Equation: \_\_\_\_\_

\_\_\_\_\_

Therefore, \_\_\_\_\_



5) A group of friends ( $f$ ) go on a trip together. They all agree they will equally split up the driving duties. The total ( $t$ ) distance is 1750km. Each friend drove ( $d$ ) 250km. How many friends went on the trip?

Equation: \_\_\_\_\_

\_\_\_\_\_

Therefore, \_\_\_\_\_



# Matching Game: Do The Equations Match

## Objective

What are we learning about?

To enhance students' understanding of equality within addition and subtraction equations. Students will identify and match pairs of equations that yield the same result, fostering critical thinking and problem-solving skills in a collaborative group setting.

Materials: \_\_\_\_\_ will need for the activity

- Pre-prepared addition and subtraction cards.
- Small bags or envelopes to hold the cards for each group.



## Instructions

How you will complete the activity

1. Before the class, the teacher will cut out the prepared matching game cards.
2. Divide the students into small groups and give each group a small envelope containing a set of the matching cards.
3. In their groups, students will spread out the cards face down on their table.
4. Each person takes a turn to try to match two cards. They will need to solve both equations to see if they match (equal the same).
5. If they find a correct match, they keep the cards out and continue with their next turn. If the cards don't match, they turn them back over in the same place, and the next player takes a turn.
6. The activity continues until all pairs are correctly matched within each group.

Cards

Matching Game Cards

$35 + 20$

$25 + 30$

**PREVIEW**

$30 \times 4 + 80$

$80 \div 2$

$100 - 60$

$12.5 + 22.5$

$25 + 10$

$60 - 25$

$30 + 5$

## Cards

## Matching Game Cards

$50 \div 2 + 30$

$10 + 45$

$35 + 15$

$60 + 25$

$24.5 + 10.5$

$5 \times 1$

$40 \div 2 - 15$

$20 - 20 + 5$

$45 \times 2 - 30$

$60 + 0$

**PREVIEW**

## Algebra Jeopardy

### Objective

What are we learning about?

To reinforce students' understanding of basic algebraic concepts and their application to solve simple equations and word problems in a fun and competitive game format.

### Materials

Materials you will need for the activity.

- Jeopardy board (see next page)
- Buzzer or bell



### Instructions

How you will complete the activity.

1. Print the Jeopardy board on the next page.
2. Divide the class into two teams.
3. Ask one team to go first by selecting a point value.
4. Read the question aloud from the point value.
5. The first team to ring the bell or buzzer gets to answer.
6. If they answer correctly, award them the points. If not, another team can answer.
7. Continue the game until all questions have been answered.
8. Tally the points to determine the winning team.
9. Conclude by discussing what they learned about the topic in the questions.

## Jeopardy Questions

Ask students the questions below

\$100	\$200	\$300	\$400	\$500
$7 + 5 = ?$	$4y = 24$ . Find $y$ .	$4x - 5 = 15$ . Find $x$ .	If 5 apples cost \$10, what is the cost of one apple?	Sarah is 4 years older than twice her sister's age. If Sarah is 28, how old is her sister?
12		$24 = 3x + 18$ . Find $x$ .	If 4 cookies cost \$8, how much does each cookie cost?	Tom has 3 times as many books as Jerry. Together they have 44 books. How many books does each have?
$5 + 8 = a$ What is $a$ ?	$5a = 25$ . Find $a$ .	$3x + 2 = 17$ . What is $x$ ?	Sarah bought 3 apples for \$15. How much did each apple cost?	Sarah has 5 times as many marbles as Ben. Together they have 42 marbles. How many marbles does each have?
$5a = 25$ . Find $a$ .	$2x + 3 = 13$ . Find $x$ .	$21n + 7 = 84$ . Solve for $n$ ?	1. The first side of a triangle is 12 cm, the second side costs \$15, and the third side costs \$18. What is the total cost?	The perimeter of a triangle is 36 cm. One side is twice the length of another side and the third side is 6 cm. How long are the other two sides?
$14 - 9 = ?$	$6 = 7 - 4 = ?$	$12r - 4 = 32$ . What is $r$ ?	If a box contains 24 candies and you give 5 to each friend, how many friends can you give candies to?	A rope is cut into two pieces. One piece is 5 times as long as the other. Together, they are 72 meters long. How long is each piece?
$5 + 8 = 3$ . What is $x$ ?	$8 = 3 - 4 = ?$	$12 = 4 + 2 = ?$	If a movie ticket costs \$12 and you buy 3 tickets, what is the total cost?	In a garden, the number of roses is 2 times the number of tulips. If there are 45 flowers in total, how many roses and tulips are there?

PREVIEW

## Mixed Operations - BEDMAS

When solving an equation, you need to follow the order of operations. This means you have to solve the equation in the correct order, not just from left to right. Using BEDMAS helps us remember the order to solve.

1. Brackets 2. Exponents 3. Division or Multiplication (whichever is first) 4. Addition or Subtraction (whichever is first)

**Example 1**

$$2 + (3 \times 7) = n$$

**Example 2**

$$\begin{aligned} n - (2 \times 3) &= 4 \\ n - 6 &= 4 \\ n &= 10 \end{aligned}$$

**Example 3**

$$\begin{aligned} (4n) - 8 &= 20 \\ 4 \times 7 - 8 &= 20 \\ n &= 7 \end{aligned}$$

### Questions

Solve the following equations using BEDMAS

1)  $3 + (4 \times 5) = n$

2)

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

4)  $n + (12 + 6) = 12$

5)  $12 + (2 + 10) - 2 = 8$

7)  $24 + 6 + 14 = t$

8)  $17 - 2 \times 5 = n$

9)  $25 - 5n = 20$

10)  $14 + n - 7 = 22$

11)  $6n + 5 = 35$

12)  $18 - 5 \times 2 = t$

## 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: 10t



### Part 1

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

1)  $9 - t$

Nine subtract

2)  $n$

3)  $b + b$

4)  $12r$

5)  $\frac{t}{9} + 5$

### Part 2

Write an algebraic expression for each statement.

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 a variable, or it could also include a coefficient.



Terms	
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 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

### Instructions

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?	

# Algebraic Expression - Terms



## Part 1

Answer the questions below about the expression provided

Expression	$9 - 3n + 30t - (2y + 7x) - 5$
List the variables	
List the constants	
List the coefficients	
How many terms are there?	

Expression	$\frac{32}{n} + 7m + 125 + 3b - 75 + 2 \times 5$
List the variables	
List the constants	
List the coefficients	
How many terms are there?	

## Part 2

Write your own expressions by following the instructions

1) Write an expression that has 4 terms, 3 coefficients, 3 variables, and 1 constant

2) Write an expression that has 5 terms, 3 coefficients, 4 variables, and 1 constant

3) Write an expression that has 6 terms, 2 coefficients, 3 variables, and 3 constants

## 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 23 cookies away to the students in her class.

Expression:



2) Cori has  $t$  brownies and divides them into  $b$  pieces. She eats 3 brownies.

Expression:



3) Alyse makes  $e$  cupcakes and shares them equally with her 8 friends.

Expression:



4) Hani gives 3 freezies to each of his  $f$  friends.

Expression:



5) Scott has 8 sodas in his fridge and buys  $s$  sodas today.

Expression:



6) Dan buys a dozen donuts and eats  $d$  number of donuts for breakfast.

Expression:



7) Steve buys  $x$  number of cookies and gives 18 to his staff.

Expression:



8) Alexa has 28 suckers that she shares equally with her  $f$  number of friends.

Expression:



9) Brian has 100 gummy worms and takes  $n$  number of gummies from his brother.

Expression:



10) Trisha gets  $n$  number of treats for every 10 goals she scores in hockey.

Expression:



## Finger Signals Quiz - Understanding Algebraic Expressions

**Objective**

What are we learning about?

Students will reinforce their understanding of algebraic expressions through an interactive finger signals quiz.

**Materials**

You will need for the activity.

- A list of questions

**Instructions**

How to complete the activity

1. Prepare a list of questions with answers labeled A, B, C, and D.
2. Explain the finger signals for each answer choice: one finger for A, two fingers for B, three fingers for C, and four fingers for D.
3. Inform the students they will show their answer by raising the appropriate number of fingers when you read each question.
4. Read the first question aloud clearly and repeat if necessary.
5. Give students a few moments to think about their answer and decide independently.
6. After a countdown (e.g., "3, 2, 1"), have all students show their answer simultaneously by raising the appropriate number of fingers.
7. Reveal the correct answer and explain why it is correct.
8. Repeat with different questions to reinforce understanding of algebraic expressions.

Question	A	B	C	D
A musician practices $m$ hours each day for 7 days. What is the total practice time?	$7+m$	$7-m$	$7m$	$m \times 7$
A cyclist rides $d$ kilometers per day for 5 days. What is the total distance?	$5+d$	$5-d$	$5d$	$d \times 5$
A library has $b$ books and gives away 3. How many books are left?	$b+3$	$b-3$	$3b$	$b \div 3$
Mia collects $s$ stamps every month. How many stamps does she collect in 3 months?	$3+s$	$3-s$	$3s$	$s \div 3$
Ben runs $r$ kilometers for a week (7 days). What is the total distance?	$7+r$	$7-r$	$7r$	$r \times 7$
A factory produces $p$ widgets every hour for 8 hours. How many widgets are produced in total?	$8+p$	$8-p$	$8p$	$p \times 8$
Lily has $t$ toys and gives away 4 to her friends. How many toys does she have left?	$t+4$	$t-4$	$4t$	$t \div 4$
David collects $c$ coins every day. How many coins does he collect in 10 days?	$10+c$	$10-c$	$10c$	$c \times 10$
Olivia reads $p$ pages every day. How many pages does she read in a week (7 days)?	$7+p$	$7-p$	$7p$	$p \times 7$
James has $b$ balloons and gives 3 away. How many balloons are left?	$b+3$	$b-3$	$3b$	$b \div 3$
Emma writes $p$ pages of her book each day for 5 days and then tears out 3 pages. How many pages are left?	$5p-3$	$5p+3$	$5 \times p + 3$	$5p \div 3$
Alex has $q$ quarters. He buys a toy that costs \$2 (8 quarters). How many quarters does he have left?	$q+8$	$q-8$	$q \times 8$	$q \div 8$
A pizza is cut into $s$ slices. Tom eats 3 slices. How many slices are left?	$s+3$	$s-3$	$3s$	$s \div 3$
Kate has $m$ marbles. She buys 7 more and then loses 2. How many marbles does she have now?	$m \times 7$	$m+2-7$	$m+7-2$	$m \div 2$
John has $t$ toys. He gives 5 to his friend and then buys 3 more. How many toys does he have now?	$t-5+3$	$t+5-3$	$5t \div 3$	$t \div 5 + 3$

## 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 1**  $y = 2$

$$2 + (1 + 2)$$

$$2 + 3$$

$$2 + 3$$

$$5$$

**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 the following expressions for  $x = 4$

1)  $x + 5 - 3$

2)  $10 - x$

3)  $42 - 3x$

4)  $\frac{12}{x} + 5^2$

5)  $15x - (20 + 5)$

### Part 2

Evaluate the following expressions for  $y = 6$

1)  $y + 8 - 2^2$

2)  $2^2 + (y - 4)$

3)  $100 - (y^2 + 3)$

## Evaluating Algebraic Expressions

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

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

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

1) $y - n + 22$ _____	2) $5n + y + n$ _____	4) $y + 7 + n$ _____
5) $35 + y + n$ _____	6) $11n - y$ _____	7) $10 + n + y$ _____

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

1) $x + p - 10$ _____	2) $10x + (2p)$ _____	3) $54 + x - p$ _____	4) $x + 9 + (3p)$ _____
5) $18 + x + (5p)$ _____	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 Write four different expressions that represent the number 8. Use  $y = 3$ .

1)

2)

3)

Part 2 Write four different expressions using multiplication or division that represents the number 6. Use  $y = 10$ .

1)

2)

3)

4)

**Adding Monomials****Questions**

Add the monomials below

1)  $4n + 6n$

= \_\_\_\_\_  $n$

2)  $8p + 2p$

= \_\_\_\_\_  $p$

3)  $13t + 12t$

= \_\_\_\_\_  $t$

4)  $7n + 7n$

= \_\_\_\_\_  $n$

5)  $24n + 32n$

= \_\_\_\_\_  $n$

6)  $29p + 39p$

= \_\_\_\_\_  $p$

7)  $7y + 9y + 18y$

= \_\_\_\_\_  $y$

8)  $14n + 16n + 8n$

= \_\_\_\_\_  $n$

9)  $17x + 26x + 34x$

= \_\_\_\_\_  $x$

10)  $n + 35n + 41n$

= \_\_\_\_\_  $n$

11)  $12y + 19y + 16y$

= \_\_\_\_\_  $y$

12)  $4p + 16p + 21p$

= \_\_\_\_\_  $p$

13)  $15y + 11y + 28y$

= \_\_\_\_\_  $y$

14)  $24n + 31n + 12n + 8n$

= \_\_\_\_\_  $n$

15)  $6y + 12y + 17y + 11y$

= \_\_\_\_\_  $y$

16)  $13y + 26y + 15y + 11y$

= \_\_\_\_\_  $y$

17)  $31t + 37t + 11t + 7t$

= \_\_\_\_\_  $t$

18)  $a + 97a + 13a + 21a$

= \_\_\_\_\_  $a$

## Adding Monomials

### Multiple Choice

Circle the correct answer

1) $10s + 6s$	6) $22p + 7p$
a) $16s$	a) $29$
b) $15s$	b) $28$
c) $16$	c) $29p$
d) $16s^2$	d) $29p^2$
2) $59x + 59y$	7) $65n + 37n$
a) $59x$	a) $97n$
b) $59b^2$	b) $102n$
c) $59b$	c) $102n^2$
d) $59$	
3) $12y + 9y + 8y$	8) $24n + 15n$
a) $28y$	a) $39n$
b) $28y^2$	b) $39$
c) $29y$	c) $67n$
d) $29y^2$	d) $67n$
4) $n + 63n + 46n$	9) $18y + 19y + 14y$
a) $110$	a) $59y$
b) $111n$	b) $58y$
c) $110n$	c) $59y^2$
d) $111$	d) $58y^2$
5) $22y + 13y + 28y + y + y$	10) $27n + 22n + 11n + 8n$
a) $64y$	a) $68n$
b) $65y^2$	b) $68n^2$
c) $68y$	c) $67n^2$
d) $68y$	d) $67$

## Introduction to Inequalities

Inequalities are used to tell the relative size of two expressions or numbers. We can use the greater than sign ( $>$ ), or the smaller than sign ( $<$ ). We can also use a new sign ( $\geq$ ) to show that a value is equal to or greater/less than the other value.

We often use a number line to graph the range of values that hold true for an inequality. An open dot on a number line is used when an inequality involves "less than" or "greater than", and a closed dot is used when it also includes "equal to".

Examples:



### Questions

Graph the inequality on the number line and write the word form.

1)  $x \geq 7$



Word Form -  $x$  is greater than or equal to 7.

2)  $x \leq 15$



Word Form - \_\_\_\_\_

3)  $x < 7$



Word Form - \_\_\_\_\_

4)  $x > 19$



Word Form - \_\_\_\_\_

5)  $x \geq 12$



Word Form - \_\_\_\_\_

6)  $x \leq 17$



Word Form - \_\_\_\_\_

**Inequalities – Multiple Choice****Questions**

Circle the values that satisfy each inequality

1)

$x > 26$

45   18   10   33

2)

$x < 49$

17   62   55   33

3)

$x < 75$

47   75   5

4)

$x > 55$

62   53   71   55

5)

$x < 68$

52   66   75   73

$x \leq 88$

72   91

7)

$x > 83$

83   92   82   95

8)

$x < 85$

88   85   83

9)

$x \leq 96$

95   85   96   103

10)

$x > 92$

92   90   95   93

11)

$x < 99$

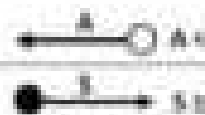
95   88   102   99

12)

$x < 95$

95   90   100   98

**PREVIEW**

**Solving Inequalities - Addition****Questions**

Graph the addition inequalities using the number line

1)  $3 + a = 10$



2)  $8 + b \leq$



3)  $c$



4)  $d + 10 \leq 11$



5)  $13 + e \geq 15$



6)  $5 + f = 18$



7)  $g + 1 = 7$



8)  $10 + h \geq 18$

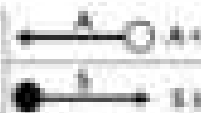


9)  $12 + m = 20$



10)  $n + 11 \leq 16$

**PREVIEW**

**Solving Inequalities - Subtraction****Questions**

Graph the subtraction inequalities using the number line

1)  $13 - a > 7$



2)  $18 - b < 9$



3)  $c < 10$



4)  $d - 10 \leq 6$



5)  $13 - e \geq 4$



6)  $5 - f = 1$



7)  $g - 1 > 7$



8)  $10 - h \geq 6$



9)  $12 - m > 8$



10)  $n - 11 \leq 9$

**PREVIEW**

## Inequalities to 100

### Part 1

Graph the inequality on the number line and write the word form

1)  $x < 40$



Word Form - \_\_\_\_\_

2)  $x \leq 60$



Word Form - \_\_\_\_\_

3)  $x > 20$



Word Form - \_\_\_\_\_

4)  $x = 40$



Word Form - \_\_\_\_\_

5)  $x \geq 10$



Word Form - \_\_\_\_\_

### Part 2

Write the inequality shown on each number line



Answer  
\_\_\_\_\_



Answer  
\_\_\_\_\_



Answer  
\_\_\_\_\_



Answer  
\_\_\_\_\_

**Addition and Subtraction Inequalities to 100****Part 1**

Graph the addition inequalities using the number line.

1)  $40 + a > 70$



2)  $60 + b \leq 40$



3)  $c < 40$



4)  $d + 20 \leq 50$



5)  $40 + e \geq 80$

**Part 2**

Graph the subtraction inequalities using the number line.

6)  $50 - f > 30$



7)  $g - 10 > 70$



8)  $50 - h \geq 30$



9)  $100 - m < 80$



10)  $n - 10 \leq 70$



**Inequalities – Adding and Subtracting****Questions**

Solve the inequalities below

1)

$$x + 6 = 12 - 5$$
$$x > 13$$

2)

$$x < 9 \times 3 - 8$$

3)

$$7 \leq 3$$

4)

$$t \geq 5 - 4 + 20$$

5)

$$x < 8 + 10 - (4 \times 2)$$

$$p \leq 27 - 7 + 15$$

7)

$$x > 6 \times 5 + 2$$

8)

$$7$$

9)

$$x \leq 16 + 4 \times 10$$

10)

$$x > 65 - 6 + 13$$

11)

$$x < 9 \times (4 + 6)$$

12)

$$x < (24 + 8) \times 6$$

**PREVIEW**

## Graphing Inequalities – Multiple Operations

### Questions

Graph the inequalities on the number line



1)

$$x > 2 + 10 - 5$$



2)

$$x < 14 - 10 + 4$$



3)

$$x \leq 12 - 9$$



4)

$$t > 15 - 13 + 16$$



5)

$$t \geq 12 \times 3 - 9$$



$$p \leq 42 + 6 + 15$$



7)

$$x > 11 \times 6 - 13$$



8)

$$x < 18 + 9$$



9)

$$x \leq 32 + 4 \times 9$$



10)

$$x > 65 + 16 - 8$$



11)

$$9 \times 3 \times 3 + 10 < x$$



12)

$$60 + 6 \times 9 + 8 > x$$



PREVIEW

## Inequalities – Isolating the Variable

### Steps to isolating a variable

1. Add or subtract the same amount from both sides so that the variable is by itself
2. If the number that is with the variable is positive, you will subtract the same number from both sides.
3. If it is negative, you will add the number to both sides.
4. Since we want the variable on the left, we might need to flip it to the other side at the end. When we do this, we switch the inequality sign from  $>$  to  $<$  or from  $<$  to  $>$ .

Example

$$\begin{aligned}y - 14 &< 9 \\ y - 14 + 14 &< 9 + 14 \\ y &< 23\end{aligned}$$

$$\begin{aligned}15 &> x + 9 \\ 15 - 9 &> x + 9 - 9 \\ 6 &> x \\ x &< 6\end{aligned}$$

### Questions

Solve for the variable.

1)

$$x - 5 < 9$$

$$y + 10 < 19$$

3)

$$x + 13 \leq 18$$

4)

$$13 \leq 18 - s$$

5)

$$9 < p + 15$$

6)

$$48 < h + 21$$

7)

$$x + 25 > 39$$

8)

# Inequalities – Isolating the Variable

## Questions

Graph the inequalities on the number line



1)

$$6 + x > 10$$



2)

$$x - 8 < 1$$



3)



4)

$$6 + t > 25 - 5$$



5)

$$8 + t \geq 10 \times 3$$



6)

$$t \leq 50 \div 5$$



7)

$$x - 10 > 11 \times 4$$



8)

$$x - 12 \leq 9 + 15$$



9)

$$8 + x \leq 9 \times 9$$



10)

$$11 + x + 65 + 20 = 3$$



PREVIEW

## Algebra Quiz - Equations

### Part 1

Find out the value of the variable

$9 + n = 15$ $n =$	$124 + 15 = y$ $y =$	$p + 48 = 79$ $p =$
$9 + 2 = y$ $y =$	$76 - y = 61$ $y =$	$p - 16 = 50$ $p =$
$n \times 6 = 36$ $n =$	$n \times 6 = 36$ $n =$	$s \times 6 = 48$ $s =$
$45 + n = 11 + 5$ $n =$	$11 + 5$ $n =$	$24 + 4 = p$ $p =$

### Part 2

Find out the value of the variable

$a + b + c = d$ $a = 9$ $b = 10$ $c = 8$ $\underline{\quad} + \underline{\quad} + \underline{\quad} = d$ $d =$	$t + g = 6$ $\underline{\quad} + \underline{\quad} = 6$ $h =$
$r + y = t$ $r = 28$ $y = 7$ $\underline{\quad} + \underline{\quad} = t$ $t =$	$en = f$ $e = 2$ $\underline{\quad} \times \underline{\quad} = f$ $f =$
$ab + c$ $a = 6$ $b = 8$ $\underline{\quad} \times \underline{\quad} + c$ $c =$	$e + c + g = t$ $e = 9$ $c = 6$ $g = 14$ $\underline{\quad} + \underline{\quad} + \underline{\quad} = t$ $t =$
$a - b = c$ $a = 108$ $b = 11$ $\underline{\quad} - \underline{\quad} = c$ $c =$	$e - n = f$ $e = 125$ $n = 22$ $\underline{\quad} - \underline{\quad} = f$ $f =$

**Part 3**

Find the value of the variables below

$$6.5 - n = 3$$

$$n =$$

$$n - 2.5 = 4$$

$$n =$$

$$s - 3.2 = 2$$

$$s =$$

$$22.7 - n = 20.1$$

$$n =$$

$$9.1 - p = 7$$

$$p =$$

$$12.1 - r = 10.5$$

$$r =$$

$$n =$$

$$n + 16.5 = 18.5$$

$$n =$$

$$22.2 + n = 23.1$$

$$n =$$

**Part 4**

Find the value of the variables using BEDMAS

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

$$25$$

$$(8 \times 4) + (4 + 2) = t$$

$$n + (12 + 6) = 12$$

$$18 - 5 + (6 \times 8) = n$$

$$75$$

**Part 5**

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 decide to budget (b) \$400 on dinner out for 4 nights. They spent \$90 on the first (f) dinner, \$128 on the second (s) dinner and \$85 on the third (t) dinner. How much do they have left for the fourth dinner (f)?

Equation: \_\_\_\_\_

\_\_\_\_\_

Therefore, \_\_\_\_\_

3) A family of 6 (f) buys a pack of donuts. Each family member gets 4 donuts (d). How many donuts were there in total (t)?

Equation: \_\_\_\_\_

\_\_\_\_\_

Therefore, \_\_\_\_\_

4) Hailey spent (t) at a sporting goods store. She bought new skates (s) for \$275, new gloves (g) for \_\_\_\_\_ and a new stick for (c) number of dollars. How much is s worth?

Equation: \_\_\_\_\_

\_\_\_\_\_

Therefore, \_\_\_\_\_

### Part 6

Add the monomials together

1)  $7n + 4n$

= \_\_\_\_\_  $n$

2)  $11p + 5p$

= \_\_\_\_\_  $p$

4)  $12b + 11b$

= \_\_\_\_\_  $b$

5)  $28n + 32n$

= \_\_\_\_\_  $n$

6)  $32p + 39p$

= \_\_\_\_\_  $p$

7)  $18y + y + 18y$

= \_\_\_\_\_  $y$

8)  $14n + 28n + 18n$

= \_\_\_\_\_  $n$

9)  $15x + 16x + 34x$

= \_\_\_\_\_  $x$

## Part 7

Graph the inequalities on the number line

1)  $3 + a > 10$



2)  $8 + b \leq 15$



3)  $c - 5 > 12$



4)  $d - 2 < 6$



5)

$x > 2 + 10 - 5$

$x < 14 - 10 + 4$



7)

$y \leq 12 + 3 + 13$



8)

$t < 15$



9)

$x - 10 > 11 \times 4$



10)

$x - 12 \leq 9 + 3 \times 15$

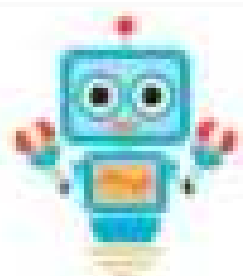


**Grade 6**  
**C3. Coding**

	<b>Curriculum Expectations</b>	<b>Pages That Cover the Expectations</b>
<b>C3.1</b>	solve problems and create computational representations of mathematical situations by writing and executing efficient code, including code that involves conditional statements and other control structures	178 - 179, 182 - 188, 190 - 198, 201 - 210
<b>C3.2</b>	read and alter existing code, including code that involves conditional statements and other control structures, and describe how changes to the code affect the outcomes and the efficiency of the code	180 - 181, 183, 185 - 186, 189, 195 - 197, 199 - 200

Name: \_\_\_\_\_

# Writing Code

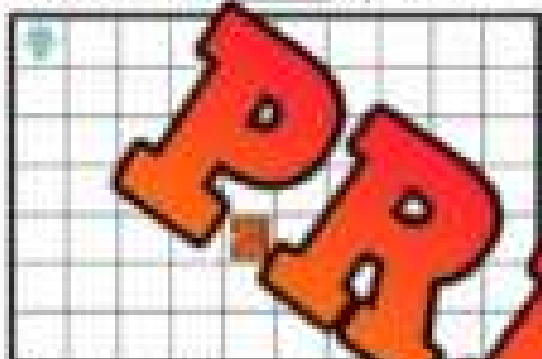


## Writing Code - Code Bank

- go right (# of spaces)
- go left (# of spaces)
- go down (# of spaces)
- go up (# of spaces)
- open door



Robot moved \_\_\_\_\_ squares



1. Write the code that gets the robot to the door

Line 1: \_\_\_\_\_

Line 2: \_\_\_\_\_

Line 3: \_\_\_\_\_

2. Write the code that gets the robot to the gym then home.

Line 1: \_\_\_\_\_

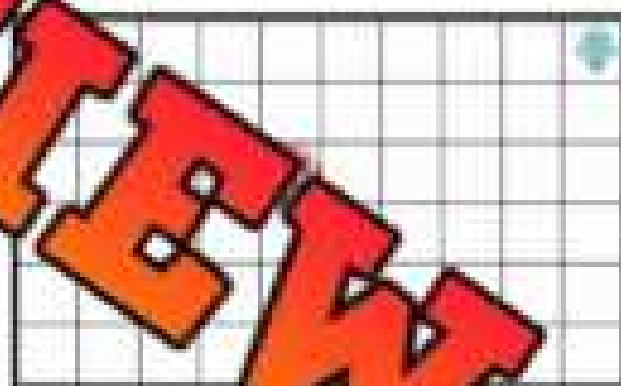
Line 2: \_\_\_\_\_

Line 3: \_\_\_\_\_

Line 4: \_\_\_\_\_

Line 5: \_\_\_\_\_

Line 6: \_\_\_\_\_



Robot moved \_\_\_\_\_ squares

3. Write the code that gets the robot to the gym and then home.

Line 1: \_\_\_\_\_

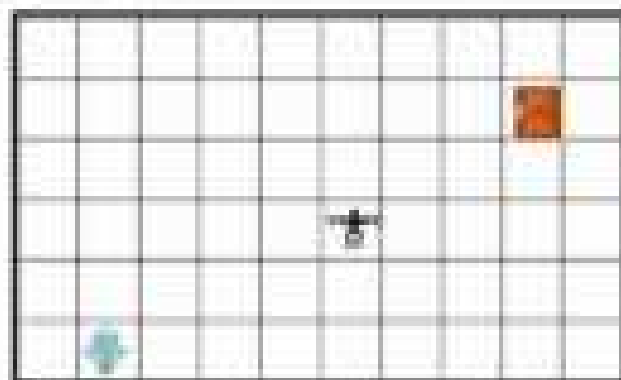
Line 2: \_\_\_\_\_

Line 3: \_\_\_\_\_

Line 4: \_\_\_\_\_

Line 5: \_\_\_\_\_

Line 6: \_\_\_\_\_



Robot moved \_\_\_\_\_ squares

**PREVIEW**

# Fixing Code

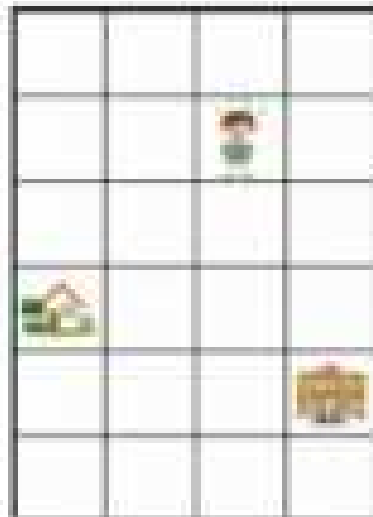
**Question**

Put the scrambled code in the correct order by labelling the steps 1-6

1. Go to school and then home

**Code**

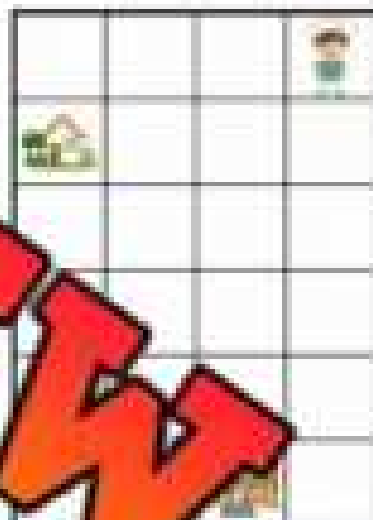
- \_\_\_\_\_ - go up 1
- \_\_\_\_\_ - go down 3
- \_\_\_\_\_ - go left 3
- \_\_\_\_\_ - enter school



2. Go to school and then home

**Code**

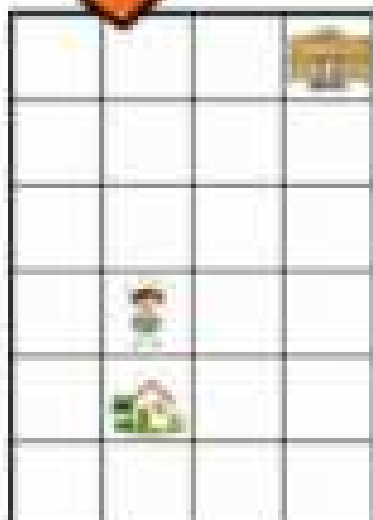
- \_\_\_\_\_ - go up 4
- \_\_\_\_\_ - go down 5
- \_\_\_\_\_ - go left 2
- \_\_\_\_\_ - enter school
- \_\_\_\_\_ - go left 1
- \_\_\_\_\_ - enter home



3. Go to school and then home

**Code**

- \_\_\_\_\_ - go up 3
- \_\_\_\_\_ - go down 4
- \_\_\_\_\_ - go right 2
- \_\_\_\_\_ - enter school
- \_\_\_\_\_ - go left 2
- \_\_\_\_\_ - enter home

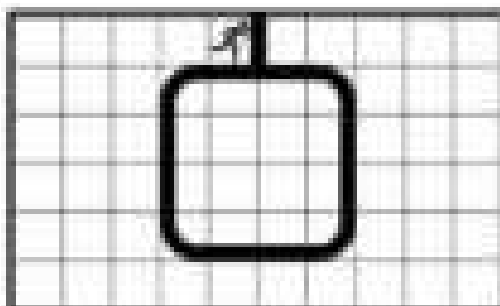


**PREVIEW**

# Writing Code - Loops

## Writing Code - Code Bank

- go right (# of spaces)
- go left (# of spaces)
- go down (# of spaces)
- go up (# of spaces)
- loop \_\_\_ times



## Example

- loop 5 times
- go right 3
- go down 3
- go left 3
- go up 3
- go right 2
- go right 1

Question: Write a code that sends the runner around the track.

1. Use a loop to send the runner around the track 5 times. (Don't forget to cross the finish line!)

Line 1: \_\_\_\_\_

Line 2: \_\_\_\_\_

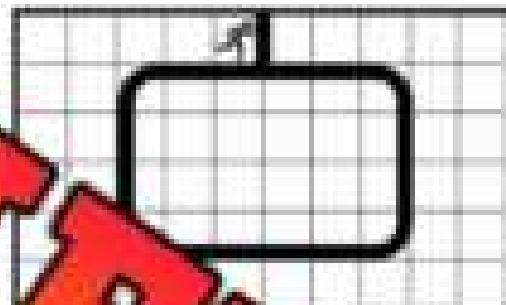
Line 3: \_\_\_\_\_

Line 4: \_\_\_\_\_

Line 5: \_\_\_\_\_

Line 6: \_\_\_\_\_

Line 7: \_\_\_\_\_



2. Use a loop to send the runner around the track 3 times. (Don't forget to cross the finish line!)

Line 1: \_\_\_\_\_

Line 2: \_\_\_\_\_

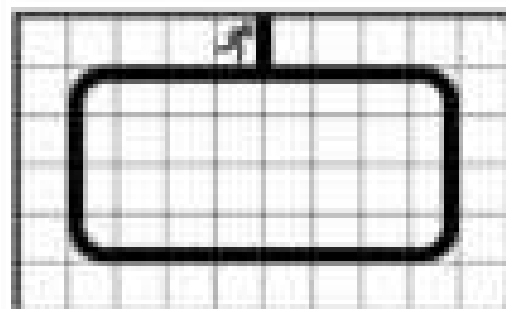
Line 3: \_\_\_\_\_

Line 4: \_\_\_\_\_

Line 5: \_\_\_\_\_

Line 6: \_\_\_\_\_

Line 7: \_\_\_\_\_



**PREVIEW**

# Writing Code - Loops

1. Use a loop to send the runner 1600 metres.

Line 1: \_\_\_\_\_

Line 2: \_\_\_\_\_

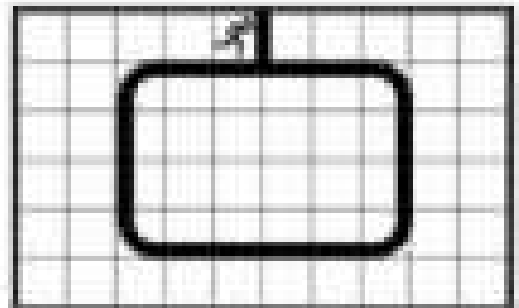
Line 3: \_\_\_\_\_

Line 4: \_\_\_\_\_

Line 5: \_\_\_\_\_

Line 6: \_\_\_\_\_

Line 7: \_\_\_\_\_



1 lap = 200 metres

2. Use a loop to send the runner 1000 metres.

Line 1: \_\_\_\_\_

Line 2: \_\_\_\_\_

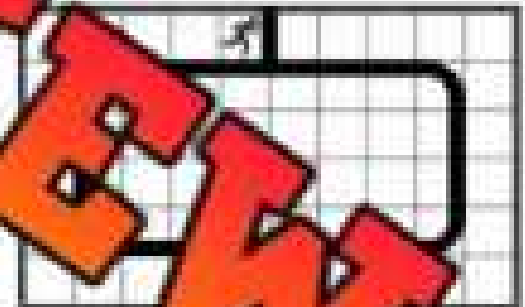
Line 3: \_\_\_\_\_

Line 4: \_\_\_\_\_

Line 5: \_\_\_\_\_

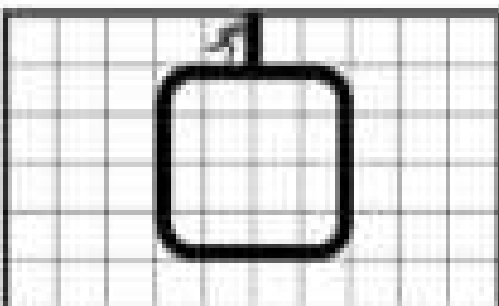
Line 6: \_\_\_\_\_

Line 7: \_\_\_\_\_



1 lap = 200 metres

**PREVIEW**



1 lap = 200 metres

3. Read the code and figure out how far the runner went.

### Code

```

loop 15 times
  go right 3 spaces
  go down 5 spaces
  go left 5 spaces
  go up 5 spaces
  go right 2 spaces
go right 1 space
run program

```

My Answer

# Concurrent Coding

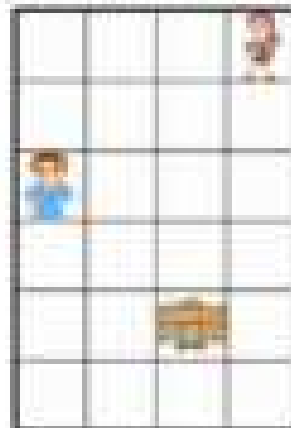
Concurrent codes are events that happen at the same time. It is the opposite of sequential codes, which happen one after the other.

Example - race to school - concurrent coding

Boy    Go down 2    Go right 2    Enter school

Girl    Go down 4    Go left 1    Enter school

Who won? Spaces traveled - (boy 4) girl 5

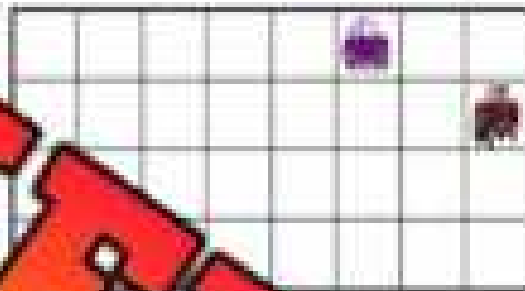


## Questions

two vehicles as the vehicles race to the store

Car





Truck



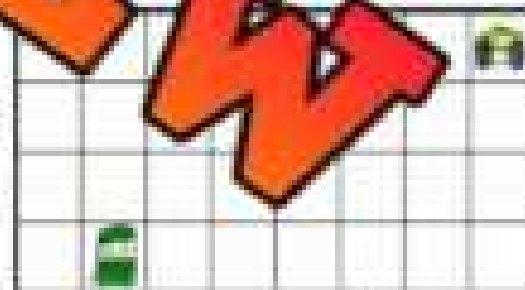

Who won? Spaces traveled - car \_\_\_\_\_ truck \_\_\_\_\_

Bus




Monster Truck





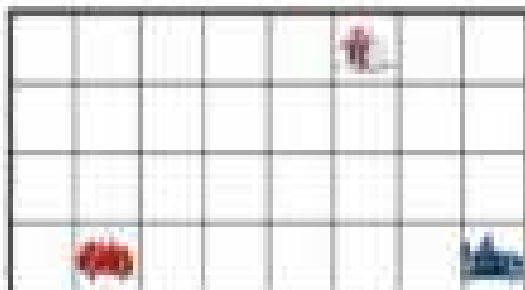
Who won? Spaces traveled - Bus \_\_\_\_\_ Monster Truck \_\_\_\_\_

F1




Sports car





Who won? Spaces traveled - F1 \_\_\_\_\_ Sports Car \_\_\_\_\_

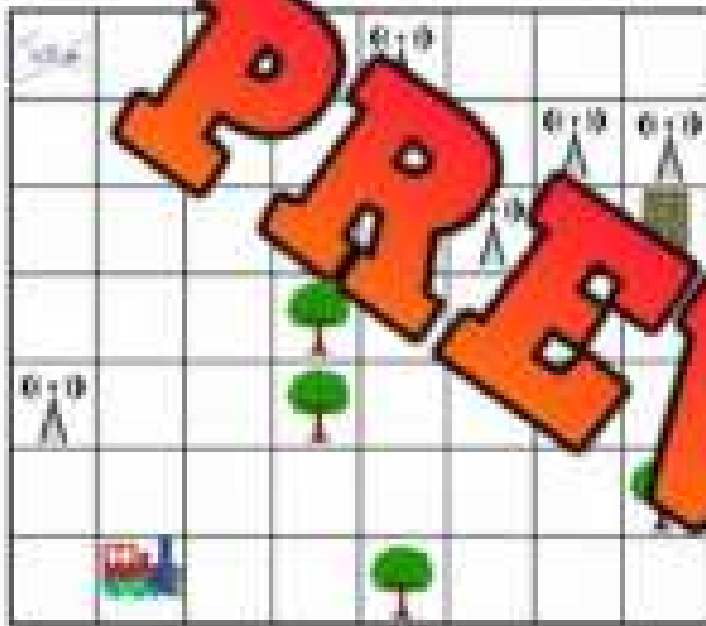


# Concurrent Coding

**Part 1** Write two separate codes as the train and plane race to the building.

Look out for the towers and trees! Make sure you code around these obstacles.

Plane						
Train						



Who won?

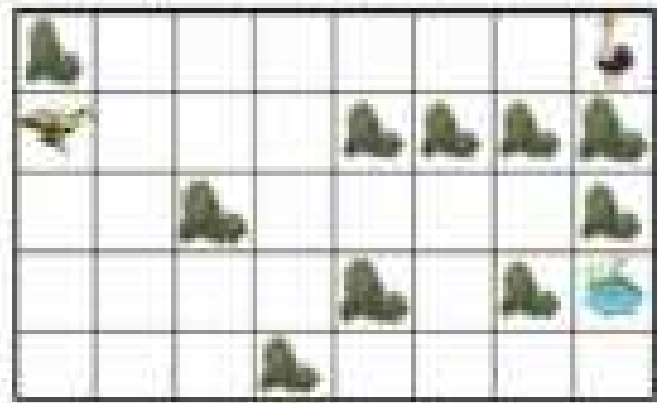
Train = \_\_\_\_\_ spaces

Plane = \_\_\_\_\_ spaces

**Part 2** Write two separate codes as the cheetah and ostrich race to the watering hole.

Look out for the bushes! Make sure you code around them.

Cheetah					
Ostrich					



Who won?

Cheetah = \_\_\_\_\_ spaces

Ostrich = \_\_\_\_\_ spaces

## Introduction to If/Then Statements

An if/then statement is a conditional that is an action that could occur if something specific happens.

For example - If the bell goes at school, then the students go to class.



### Questions

Fill in the If/Then Statements with outcomes that make sense

1)	If the eggs _____	then _____
2)	If the red _____ whistle _____	_____
3)	If it is hot _____	_____
4)	If the alarm clock goes off in the morning _____	_____
5)	If I cross the finish line first _____	_____
6)	If the traffic light is red _____	_____
7)	If the phone battery is 0 _____	_____
8)	If the time limit is reached _____	_____
9)	If the SHIFT key is pressed when typing a letter _____	_____
10)	If the soccer ball goes out of bounds _____	_____

## If Statements – Conditional Coding

An if statement allows a code to be run if an event has happened. If the event does not happen, the code is not run. All interactive games use if statements. For example, when a game has a button in it, the button will have an if code. This means that if the button is pushed, then a code will run that causes something to happen.

**Example Code** - If player gets 50 points, then print "Great Job"



**Question** Write the answer to the question and then run the code

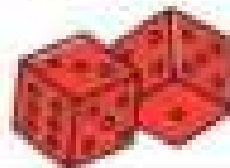
Written	The Computer Prints...
If answer is $\geq 75$ , then print "Great job!" If answer is $< 75$ , then print "Try again!" run $9 \times 9 - 12$	
If y is $< 135$ , then print "Better luck next time!" If y is $\geq 135$ , then print "Wow, great job!" run $y = 7 \times 11 + 50$	
If player has $\geq 100$ points (p), then print "You win" If player has $< 100$ points (p), then print "You lose" run $p = 28 + 4 \times 15$	
If student mark (m) is $\geq 80\%$ , then print "Genius!" If student mark (m) is $< 80\%$ , then print "Good effort!" run $m = 75/100$	
If student mark (m) is $\geq 50\%$ , then print "You passed" If student mark (m) is $< 50\%$ , then print "You failed" run $m = 49/90$	

## If Statements – Dice Game

The object of the game is to get as many points as you can. Follow the if/then statements to get points.

### Instructions

1. Start at question 1. Read the if/then statement to get points
2. Go through all 10 questions and add up your points at the end



**Questions** Use a dice to play the game below. Follow the if/then codes:

If/Then Code	Point Total
1) If you roll an even number, then you get 10 points If you roll an odd number, then you get 0 points	
2) If you roll a 6, then you get 10 points If you don't roll a 6, then you get 0 points	
3) If you roll a 3 or 4, then you get 10 points If you don't roll a 3 or 4, then you get 0 points	
4) If you roll a 2, then you lose all your points If you roll any other number, then you get 15 points	
5) If you roll 3 or less, then you get 10 points If you roll 4 or more, then you get 0 points	
6) If you roll a 1 or 6, then you get 10 points If you don't roll a 1 or 6, then you get 0 points	
7) If you roll 2 or more, then you get 5 points If you roll a 1, then you lose 5 points	
8) If you roll an odd number, then you get 10 points If you roll an even number, then you get 0 points	
9) If you roll a 3, then you get 10 points If you don't roll a 3, then you get 0 points	
10) If you roll a 5 or less, then you get 20 points If you roll a 6, then you lose 10 points	

## If Statements – Dice Game

The object of the game is to get as many points as you can. Follow the if/then statements and solve any equation from the list you are sent to. Cross out the equation once you have used it because you can only use each equation once. You earn the answer from the equation as points. Record your points in the column on the right.



**Instruction:** Follow the if/then codes to solve equations and earn points

If/Then Code	Points
1) If you roll a 1 or a 2, then solve an equation from list 1. If you roll a 3 or 4, then solve an equation from list 2.	
2) If you roll a 3 or 4, then solve an equation from list 3. If you roll a 2 or less, then solve an equation from list 4.	
3) If you roll a 6, then solve an equation from list 5. If you roll a number other than 6, then solve an equation from list 2.	
4) If you roll an even number, then solve an equation from list 3. If you roll an odd number, then solve an equation from list 4.	
5) If you roll a 1 or a 6, then solve an equation from list 5. If you roll a 2, 3, 4, or 5, then solve an equation from list 2.	
6) If you roll a 2 or 5, then solve an equation from any list. If you roll a 1, 3, 4, or 6, then solve an equation from list 2.	
<b>Total Points</b>	

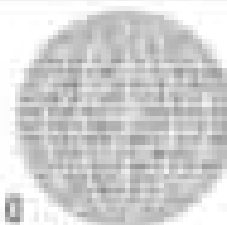
List 1	List 2	List 3	List 4	List 5	List 6
$5 + 5$	$15 - 5$	$3 \times 2$	$25 \div 5$	$12 + 12$	$3 \times 3$
$12 + 6$	$14 - 6$	$7 \times 5$	$30 \div 10$	$23 + 5$	$4 \times 6$
$13 + 8$	$40 - 32$	$3 \times 6$	$20 \div 4$	$15 + 13$	$7 \times 3$
$21 + 13$	$32 - 21$	$4 \times 5$	$12 \div 2$	$41 - 13$	$40 \div 4$
$14 + 22$	$45 - 15$	$9 \times 4$	$15 \div 3$	$50 - 10$	$48 \div 8$
$30 + 20$	$50 - 21$	$6 \times 6$	$36 \div 6$	$40 - 15$	$9 + 3$



# What is Binary Code?

## What is Binary Code?

Binary code is a coding system using the numbers 0 and 1 to represent everything a computer needs to know. The 0s and 1s are called bits.



### For example

- The on button is represented by 1 while the off switch is represented by 0
- Letters are represented by 0s and 1s. A = 01000001 or 1, B = 01000010 or 10
- Numbers are also represented by 0s and 1s. The number 1 = 1, 2 = 10, 3 = 11, 4 = 100

## Why Do Computers Use Binary?

Computers struggle to make sense of complicated data. The binary counting system is the simplest method available because it uses only two numbers. Computers can process 0s and 1s to allow them to understand what we are sending to it.

## Binary Code Alphabet

Below you can find the binary number for each letter and number in our alphabet. Binary is read from right to left. You will notice that uppercase and lowercase have their own binary code because they are different to the computer. The circles also represent binary. The black circles represent 1s while the white circles represent 0s.

01000001	A	00000000	0	00100000	0	00000000
01000010	B	00000001	1	00100001	1	00000000
01000011	C	00000010	2	00100010	2	00000000
01000100	D	00000011	3	00100011	3	00000000
01000101	E	00000100	4	00100100	4	00000000
01000110	F	00000101	5	00100101	5	00000000
01000111	G	00000110	6	00100110	6	00000000
01001000	H	00000111	7	00100111	7	00000000
01001001	I	00001000	8	00101000	8	00000000
01001010	J	00001001	9	00101001	9	00000000
01001011	K	00001010	10	00101010	10	00000000
01001100	L	00001011	11	00101100	11	00000000
01001101	M	00001100	12	00101101	12	00000000
01001110	N	00001101	13	00101110	13	00000000
01001111	O	00001110	14	00101111	14	00000000
01010000	P	00001111	15	00110000	16	00000000
01010001	Q	00010000	16	00110001	17	00000000
01010010	R	00010001	17	00110010	18	00000000
01010011	S	00010010	18	00110011	19	00000000
01010100	T	00010011	19	00110100	20	00000000
01010101	U	00010100	20	00110101	21	00000000
01010110	V	00010101	21	00110110	22	00000000
01010111	W	00010110	22	00110111	23	00000000
01011000	X	00010111	23	00111000	24	00000000
01011001	Y	00011000	24	00111001	25	00000000
01011010	Z	00011001	25	00111010	26	00000000



## Writing Binary

When these letters are typed, what does the computer see?

Input	Binary Code Version
Example Sam	01010011 01100001 01101101
Your Name (Choose a short form)	
Canada	
Jan 11	

## Reading Binary

Read the binary code and decode the message. The answer is told  
Hint - it is all in the code.

Binary Code Version	Input
01100011 01101111 01100100 01100101	
01101101 01100001 01110100 01101000	
01110011 01100011 01101001 01100101 01101110 01100011 01100101	
01100110 01110101 01101110	

# What is Binary Code?

## Writing Binary

Shade in the 1s and leave the 0s white



Input	Binary Code Version		
Example Sam	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
code	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
binary	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
bit	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

**PREVIEW**

## Reading Binary

Read the binary code and write what was told  
Hint - It is a word

Binary Code Version		
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

## Writing Code – TV Remote

### How Does a TV Remote Work?

The battery inside the remote gives it electricity. The remote has an LED light that sends binary code to the TV. The TV has been programmed to understand the binary code it is being sent.



For example,

Remote Code	
if <b>on</b> button pressed	
then send <b>01101110</b> to the television	
TV Code	
if <b>on</b> button pressed	
then <b>close</b> the TV	

### Binary

When the remote button is pressed, what binary code is sent to the TV?



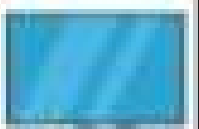
Remote Code	
if volume <b>up</b> button is pressed	
then send <input style="width: 80%;" type="text"/> to the television	



Remote Code	
if channel <b>down</b> button is pressed	
then send <input style="width: 80%;" type="text"/> to the television	



Remote Code	
if <b>off</b> button is pressed	
then send <input style="width: 80%;" type="text"/> to the television	



## Coding Challenge: Metres and Centimetres Converter

### Objective

What are we learning about?

You're going to build a simple program that can convert between metres (m) and centimetres (cm). Your program will ask the user what kind of conversion they want to do, take their measurement, and show the answer.



### Instructions

How you will complete the activity

1. You're going to build a simple program that asks the user whether they want to convert from centimetres to metres or from metres to centimetres. Based on what they choose, your program will do the right math and show the answer.
2. Start by creating variables to store the user's input (like choice, metres, centimetres) or the result of the conversion (like converted).
3. Ask the user what they want to do. Then use an `input` block like `ask`, `prompt`, or `input`. Let them choose between two options. For example, they can type "A" to convert metres to centimetres or "B" to convert centimetres to metres!
4. Use a conditional statement to check their answer. You can use an `if-else` block to run different code depending on whether they chose "A" or "B".
5. If they chose A, ask them to enter a number in metres. Multiply that number by 100 to convert to centimetres and save the result.
6. If they chose B, ask them to enter a number in centimetres. Multiply that number by 0.01 to convert to metres and save the result.
7. Use a `print`, `output`, or `say` command to show the answer back to the user. Make sure it clearly explains what the number means.
8. Test your program by running it and trying different answers. Make sure the output makes sense and the math is correct.
9. If you finish early, try making your code fancier: you could add more instructions, use a loop to repeat the program, or add sound effects.

**Example**

Below is an example program that performs this task

Line #	Code (Pseudocode Style)
1	set metres = 0
2	set centimetres = 0
3	set convertMetres = 0
4	set convertCentimetres = 0
5	set key = "blank" or keyPressed = "B"
6	output "Enter A to convert from metres to centimetres. Type B to convert from centimetres to metres."
7	store user input as key
8	if keyPressed = "A" then
9	output "Enter measurement in metres:"
10	store user input as metres
11	set convertCentimetres = metres * 100
12	output metres = "metres is" convertCentimetres "centimetres."
13	else
14	output "Enter measurement in centimetres:"
15	store user input as centimetres
16	set convertMetres = centimetres * 0.01
17	output centimetres = "centimetres is" convertMetres "metres."
18	

**Program**

Use the space below to write your code using lines of code or a flow chart

**PREVIEW**

## Interpreting Code – Heads or Tails Probability

### Analyze

The code below keeps track of a user flipping a coin 10 times. It uses a counter to add 1 each time a heads or tails happens.

```
set heads = 0
set tails = 0
flip = 0
repeat 10 times
  coin = random number between 0 and 1
  if coin < 0.5
    heads = heads + 1
  else
    tails = tails + 1
output "Number of heads" heads
output "Number of tails" tails
```

### Questions

Answer the questions below

- 1) Why do we set the variables heads and tails to zero at the beginning?
- 2) What does the repeat 10 times command tell the program to do? Why is 10 used?
- 3) What does coin == 1 then mean?

**Questions**

Answer the questions below

4) If 1 == heads, then why isn't 2 used for tails?

5) What does the line `heads = heads + 1` actually do?

6) How could you make the program perform...

100 coin flips?

1 000 coin flips?

10 000 coin flips?

7) How does the program "know" whether to add to heads or tails?

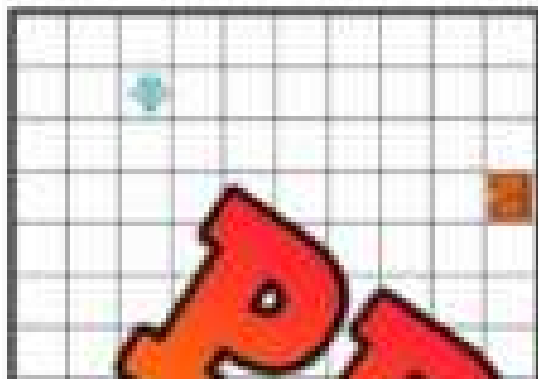
8) How could you modify the program to repeat until one side reaches 5 instead of using repeat 10 times?

**PREVIEW**

# Coding Quiz

## Part 1

Write the code below



1. Write the code that gets the robot to the door

Line 1: \_\_\_\_\_

Line 2: \_\_\_\_\_

Line 3: \_\_\_\_\_

Robot moved

2. Write the code that gets the robot to the store and then home.

Line 1: \_\_\_\_\_

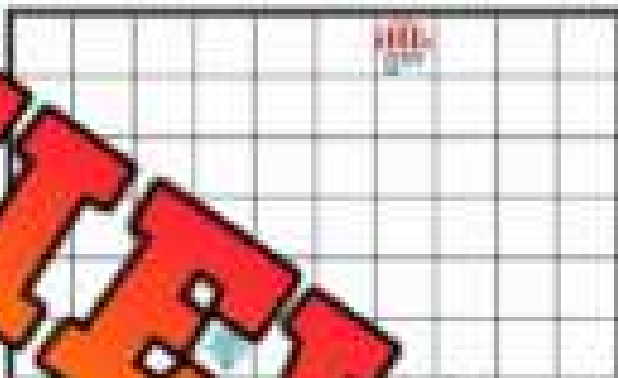
Line 2: \_\_\_\_\_

Line 3: \_\_\_\_\_

Line 4: \_\_\_\_\_

Line 5: \_\_\_\_\_

Line 6: \_\_\_\_\_



Robot moved

## Part 2

Put the scrambled code in the correct order by labeling the steps 1-6

3. Go to school and then home

### Code

- \_\_\_\_\_ - go up 4
- \_\_\_\_\_ - go down 2
- \_\_\_\_\_ - enter school
- \_\_\_\_\_ - go left 3
- \_\_\_\_\_ - enter home
- \_\_\_\_\_ - go right 3



**Part 3**

Write code that sends the runner around the track

Use a loop to send the runner 5000 metres.

Line 1: \_\_\_\_\_

Line 2: \_\_\_\_\_

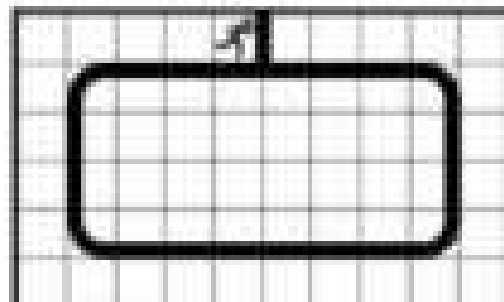
Line 3: \_\_\_\_\_

Line 4: \_\_\_\_\_

Line 5: \_\_\_\_\_

Line 6: \_\_\_\_\_

Line 7: \_\_\_\_\_



1 lap = 250 metres

**Part 4**

Write the code that should reply with based on the code written

Code Written	The Computer Prints	Code Written	The Computer Prints
<pre>x = 236 y = x + 28 print (y)</pre>	-----	<pre>y = x = (y)</pre>	---
<pre>x = 310 y = x - 18 print (y)</pre>	---	<pre>y = x print (y)</pre>	

**Part 5**

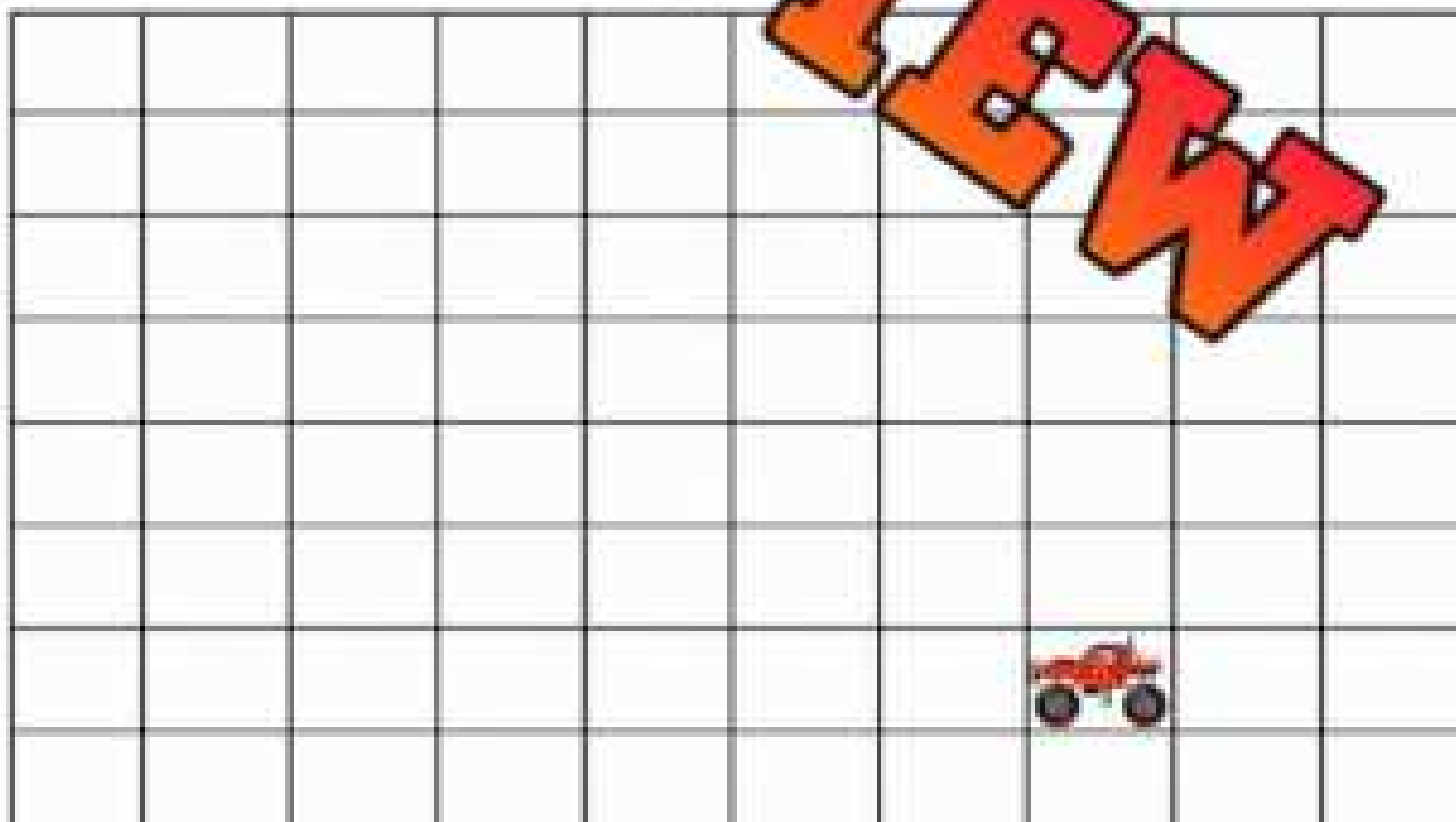
Calculate the answer to the question and then run the code

Code Written	The Computer Replied
<pre>If player has &gt;100 points (p), then print "You win" If player has &lt;100 points (p), then print "You lose"  run p = 48 + 6 x 10</pre>	
<pre>If student mark (m) is &gt;50%, then print "Genius!" If student mark (m) is &lt;50%, then print "Good effort!"  run m = 30/70</pre>	

## Part 6

Follow the if/then statements and move the bike around the grid

If/Then Conditional Statements	If/Then Conditional Statements
1) If $y = +60$ , then move bike up 5 $y = 35 + 40 - 10$	6) If $y = +350$ , then move bike right 7 $y = 100 \times 3 + 65$
2) If $t = +90$ , then move bike left 6 $t = 10 \times 3$	7) If $t = +400$ , then move bike up 4 $t = 250 + 350 - 125$
3) If $p = +100$ , then move bike down 3 $p = 7 \times 100$	8) If $p = +500$ , then move bike left 2 $p = 7 \times 100 - 250$
4) If $y = +250$ , then move bike right 4 $y = 20 \times 5 \times 3$	9) If $y = +750$ , then move bike left 4 $y = 50 \times 8 \times 2 - 100$
5) If $b = +300$ , then move bike down 5 $b = 20 \times 5 + 185$	10) If $b = +1000$ , then move bike down 5 $b = 1000 - (100 \times 2)$





# Google Slides Lessons Preview





# Ontario Math Spatial Sense Unit – Grade 6

## 3-Part Lesson Format

### Part 1 – Minds On!

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

**Learning Goal**

You are learning to plot and read coordinates in all four quadrants of a Cartesian plane so you can describe how a point moves from one place to another using translations.

**Four Quadrants - Cartesian Plane**

Coordinates	Quadrant
(1, 2)	
(2, 1)	
(-1, 2)	
(-2, 1)	
(1, -2)	
(2, -1)	
(-1, -2)	
(-2, -1)	

### Part 2 – Action!

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

### Part 3 – Consolidation!

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

**Exit Card - Quick Draw**

On a small grid (your teacher will give you or show you), plot these 3 points:

- A (-3, 4)
- B (2, -1)
- C (4, 2)

Then, draw a quick draw connecting them in order (A to B to C). Under your drawing, write one sentence explaining which quadrants your points are in and how you know.



# Ontario Math Spatial Sense Unit – Grade 6

### Translation or Not?

Are the two figures related by a translation? Write YES or NO in the box.

### Reflection

Are the two figures related by a reflection? Write YES or NO in the box.

### Clockwise and Counterclockwise

How do the shapes relate? Using the model, draw...



# Ontario Math Spatial Sense Unit – Grade 6

### Estimating Capacity

Directions: Use the capacity of the objects to estimate the capacity of the unknown objects.

Object	Capacity
Teapot	1 L
Spoon	10 mL
Bottle	250 mL
Unknown 1	?
Unknown 2	?
Unknown 3	?
Unknown 4	?
Unknown 5	?
Unknown 6	?
Unknown 7	?
Unknown 8	?
Unknown 9	?
Unknown 10	?

### Using Printed Pictures

Directions: Use the printed pictures to estimate the area of the shapes.

1. Estimate the area of the circle.

2. Estimate the area of the circle.

3. Estimate the area of the circle.

### Using Nets - Prisms

Directions: Use the nets to estimate the surface area of the prisms.

1. Estimate the surface area of the prism.

2. Estimate the surface area of the prism.

3. Estimate the surface area of the prism.



# Workbook Preview

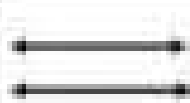


## Grade 6

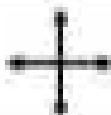
### E1 – Geometric and Spatial Reasoning

	Curriculum Expectations	Pages That Cover the Expectations
E1.1	create lists of the geometric properties of various types of quadrilaterals, including the properties of the diagonals, rotational symmetry, and line symmetry	5 - 33
E1.2	<b>Preview of 120 pages from this product that contains 450 pages total.</b>	
E1.3	plot and read coordinates in all four quadrants of a Cartesian plane, and describe the translations that move a point from one coordinate to another	46 - 56
E1.4	describe and perform combinations of translations, reflections, and rotations up to $360^\circ$ on a grid, and predict the results of these transformations	57 - 96

# Parallel, Perpendicular and Intersecting Lines



= Parallel Lines



= Perpendicular Lines



= Intersecting Lines

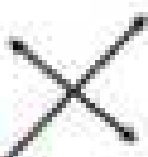
## Part 1

Label the lines parallel, perpendicular, or intersecting

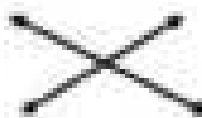
1)



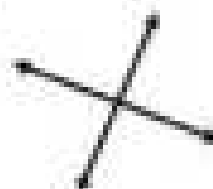
2)



3)



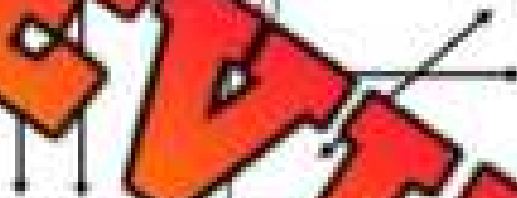
4)



5)



7)



8)



## Part 2

Draw a second line that is intersecting, perpendicular, or parallel to the other line

1)



2)



3)



4)



Perpendicular

Parallel

Intersecting

Parallel

5)



6)



7)



8)



Intersecting

Perpendicular

Intersecting

Parallel

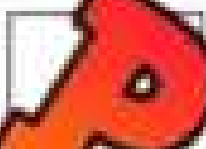
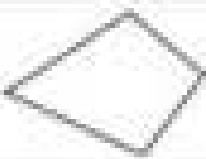




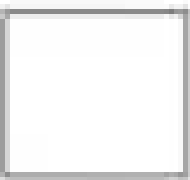
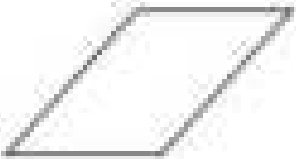

## Quadrilaterals - Lines

### Word Bank


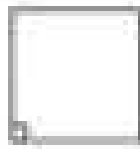
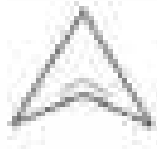
Kite    Trapezoid    Parallelogram    Rectangle    Rhombus    Square

### Practice


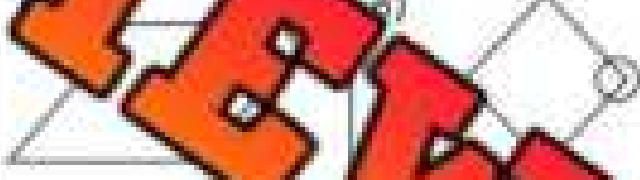
1. Label the quadrilaterals using the word bank (can be used twice).
2. How many pairs of perpendicular, intersecting, and parallel lines are there?

1) 	2) 	3) 
Name: _____	Name: _____	Name: _____
Perpendicular Lines: _____	Perpendicular Lines: _____	Perpendicular Lines: _____
Parallel Lines: _____	Parallel Lines: _____	Parallel Lines: _____
Intersecting Lines: _____	Intersecting Lines: _____	Intersecting Lines: _____
4) 	5) 	6) 
Name: _____	Name: _____	Name: _____
Perpendicular Lines: _____	Perpendicular Lines: _____	Perpendicular Lines: _____
Parallel Lines: _____	Parallel Lines: _____	Parallel Lines: _____
Intersecting Lines: _____	Intersecting Lines: _____	Intersecting Lines: _____
7) 	8) 	9) 
Name: _____	Name: _____	Name: _____
Perpendicular Lines: _____	Perpendicular Lines: _____	Perpendicular Lines: _____
Parallel Lines: _____	Parallel Lines: _____	Parallel Lines: _____
Intersecting Lines: _____	Intersecting Lines: _____	Intersecting Lines: _____

## Naming Angles in Quadrilaterals

	<p><b>Obtuse</b> Larger than right angle</p> <p><b>Acute</b> Smaller than right angle</p>	 <p><b>right angle</b> 90°</p>	 <p><b>Reflex</b> Larger than 180°</p>
---	---	---	---

**Part 1** Draw the inside angle that is circled. Then label it an acute, obtuse, right, or reflex angle.

1) 	2) 	3) 	4) 
Right Angle			
5) 	6) 	7) 	

**Part 2** Circle the angles below on the shapes.

9)  2 Acute Angles	10)  2 Obtuse Angles	11)  1 Reflex Angle
--	--	---

## Quadrilaterals - Angles

### Word Bank

Kite      Trapezoid      Parallelogram      Rectangle      Rhombus      Square

#### Practice

1. Label the quadrilaterals using the word bank (can be used twice).
2. Label the angles right (R), obtuse (O), reflex (Re) or acute (A)

<p>1) </p>	<p>2) </p>	<p>3) </p>
Name: _____	Name: _____	Name: _____
# of Acute = 1	# of Acute = _____	# of Acute = _____
# of Obtuse = 2	# of Obtuse = _____	# of Obtuse = _____
# of Right = 1	# of Right = _____	# of Right = _____
# of Reflex = 0	# of Reflex = _____	# of Reflex = _____
<p>4) </p>	<p>5) </p>	<p>6) </p>
Name: _____	Name: _____	Name: _____
# of Acute = _____	# of Acute = _____	# of Acute = _____
# of Obtuse = _____	# of Obtuse = _____	# of Obtuse = _____
# of Right = _____	# of Right = _____	# of Right = _____
# of Reflex = _____	# of Reflex = _____	# of Reflex = _____
<p>7) </p>	<p>8) </p>	<p>9) </p>
Name: _____	Name: _____	Name: _____
# of Acute = _____	# of Acute = _____	# of Acute = _____
# of Obtuse = _____	# of Obtuse = _____	# of Obtuse = _____
# of Right = _____	# of Right = _____	# of Right = _____
# of Reflex = _____	# of Reflex = _____	# of Reflex = _____

# Diagonals

A diagonal is a line segment that links 2 non-adjacent vertices of a polygon. This means it is a line that connects two corners that are not beside each other.





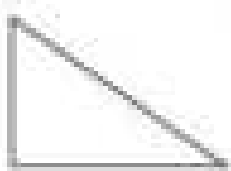


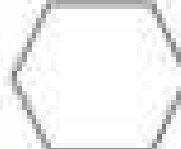

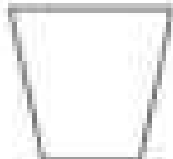



A rectangle has 2 diagonals



A pentagon has 5 diagonals

**Part 1** How many diagonal lines do the polygons have? Draw them and write the number

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

**Part 2** Draw a polygon with the specified number of diagonals

13) 9	14) 0	15) 14

## Diagonals

Diagonals can be categorized based on the following:



Whether they are of equal length




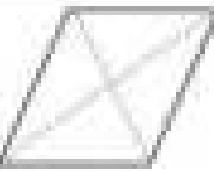


Whether they intersect at their midpoint



Whether they intersect at right angles


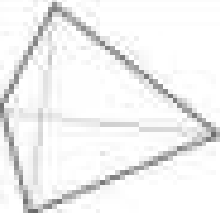


**Part 1** Do the diagonals have equal length?

1) 	2) 	3) 	4) 
Yes    No	Yes    No	Yes    No	Yes    No

**Part 2** Do the diagonals intersect at their midpoint?

5) 	6) 	7) 
Yes    No	Yes    No	Yes    No

**Part 3** Do the diagonals intersect at right angles?

9) 	10) 	11) 	12) 
Yes    No	Yes    No	Yes    No	Yes    No


# Exit Cards


Cut Out

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

Name: \_\_\_\_\_


How many diagonal lines do the polygons have? Draw them and write the number.

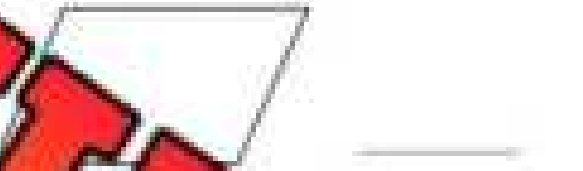
1) 

2) 

Name: \_\_\_\_\_

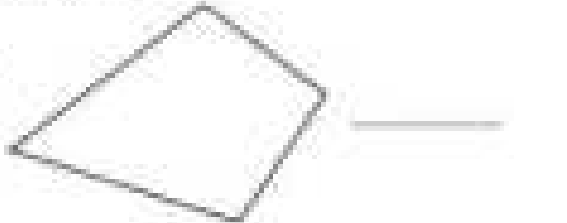
How many diagonal lines do the polygons have? Draw them and write the number.


1) 

2) 

Name: \_\_\_\_\_


How many diagonal lines do the polygons have? Draw them and write the number.


1) 

2) 

Name: \_\_\_\_\_

How many diagonal lines do the polygons have? Draw them and write the number.

1) 

2) 

**PREVIEW**


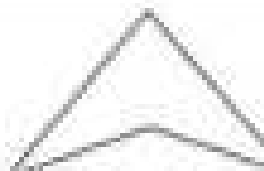



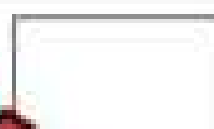



## Quadrilaterals - Diagonals

### Word Bank

Kite    Trapezoid    Parallelogram    Rectangle    Rhombus    Square




#### Practice

1. Label the quadrilaterals using the word bank (can be used twice)
2. Draw the diagonal lines on the quadrilaterals and answer the questions

1) 	2) 	3) 
Name: _____	Name: _____	Name: _____
Intersect at Midpoint? <input type="checkbox"/> Y <input type="checkbox"/> N	Intersect at Midpoint? <input type="checkbox"/> Y <input type="checkbox"/> N	Intersect at Midpoint? <input type="checkbox"/> Y <input type="checkbox"/> N
Intersect at Right Angle? <input type="checkbox"/> Y <input type="checkbox"/> N	Intersect at Right Angle? <input type="checkbox"/> Y <input type="checkbox"/> N	Intersect at Right Angle? <input type="checkbox"/> Y <input type="checkbox"/> N
Diagonals Same Length? <input type="checkbox"/> Y <input type="checkbox"/> N	Diagonals Same Length? <input type="checkbox"/> Y <input type="checkbox"/> N	Diagonals Same Length? <input type="checkbox"/> Y <input type="checkbox"/> N
4) 	5) 	6) 
Name: _____	Name: _____	Name: _____
Intersect at Midpoint? <input type="checkbox"/> Y <input type="checkbox"/> N	Intersect at Midpoint? <input type="checkbox"/> Y <input type="checkbox"/> N	Intersect at Midpoint? <input type="checkbox"/> Y <input type="checkbox"/> N
Intersect at Right Angle? <input type="checkbox"/> Y <input type="checkbox"/> N	Intersect at Right Angle? <input type="checkbox"/> Y <input type="checkbox"/> N	Intersect at Right Angle? <input type="checkbox"/> Y <input type="checkbox"/> N
Diagonals Same Length? <input type="checkbox"/> Y <input type="checkbox"/> N	Diagonals Same Length? <input type="checkbox"/> Y <input type="checkbox"/> N	Diagonals Same Length? <input type="checkbox"/> Y <input type="checkbox"/> N
7) 	8) 	9) 
Name: _____	Name: _____	Name: _____
Intersect at Midpoint? <input type="checkbox"/> Y <input type="checkbox"/> N	Intersect at Midpoint? <input type="checkbox"/> Y <input type="checkbox"/> N	Intersect at Midpoint? <input type="checkbox"/> Y <input type="checkbox"/> N
Intersect at Right Angle? <input type="checkbox"/> Y <input type="checkbox"/> N	Intersect at Right Angle? <input type="checkbox"/> Y <input type="checkbox"/> N	Intersect at Right Angle? <input type="checkbox"/> Y <input type="checkbox"/> N
Diagonals Same Length? <input type="checkbox"/> Y <input type="checkbox"/> N	Diagonals Same Length? <input type="checkbox"/> Y <input type="checkbox"/> N	Diagonals Same Length? <input type="checkbox"/> Y <input type="checkbox"/> N


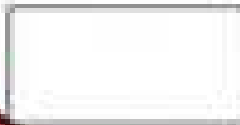

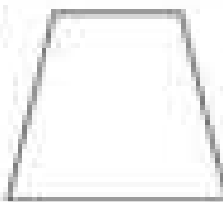
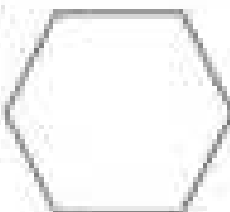

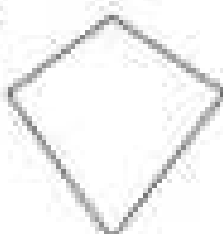
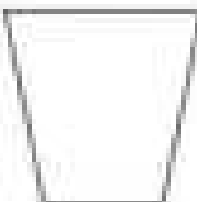
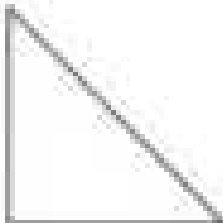

## Rotational Symmetry

A shape has rotational symmetry if it looks the same after it has been rotated from  $0^\circ$  to  $360^\circ$ . The number of times a shape matches as it is rotated is called the **order**.

Original Shape	$180^\circ$ rotation	$360^\circ$ rotation
		

This rectangle has an order of only 2 because it looks the same at  $180^\circ$  and  $360^\circ$ .

**Questions:** Find the order of rotational symmetry for each shape below

1) 	3) 	4) 	
5) 	6) 	7) 	
9) 	10) 	11) 	12) 

# Rotational Symmetry

**Questions**

Write the order of rotational symmetry for each object below

1) 	2) 	3) 	4) 
5) 	6) 	7) 	8) 
9) 	10) 	11) 	12) 
13) 	14) 	15) 	16) 


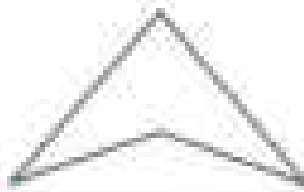
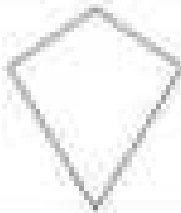



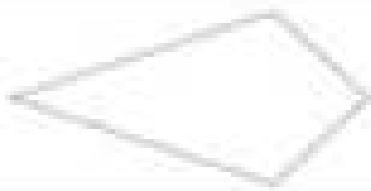


## Quadrilaterals – Rotational Symmetry

### Word Bank

Kite    Trapezoid    Parallelogram    Rectangle    Rhombus    Square

### Practice

1. Label the quadrilaterals using the word bank (can be used twice)
2. Fill in the questions about rotational symmetry

1) 	2) 	3) 
Name: _____	Name: _____	Name: _____
# of Lines of Symmetry: _____	# of Lines of Symmetry: _____	# of Lines of Symmetry: _____
Order of Rotational Symmetry: _____	Order of Rotational Symmetry: _____	Order of Rotational Symmetry: _____
4) 	5) 	6) 
Name: _____	Name: _____	Name: _____
# of Lines of Symmetry: _____	# of Lines of Symmetry: _____	# of Lines of Symmetry: _____
Order of Rotational Symmetry: _____	Order of Rotational Symmetry: _____	Order of Rotational Symmetry: _____
7) 	8) 	9) 
Name: _____	Name: _____	Name: _____
# of Lines of Symmetry: _____	# of Lines of Symmetry: _____	# of Lines of Symmetry: _____
Order of Rotational Symmetry: _____	Order of Rotational Symmetry: _____	Order of Rotational Symmetry: _____

## Quadrilaterals - Trapezoids

A trapezoid has at least one pair of parallel sides.



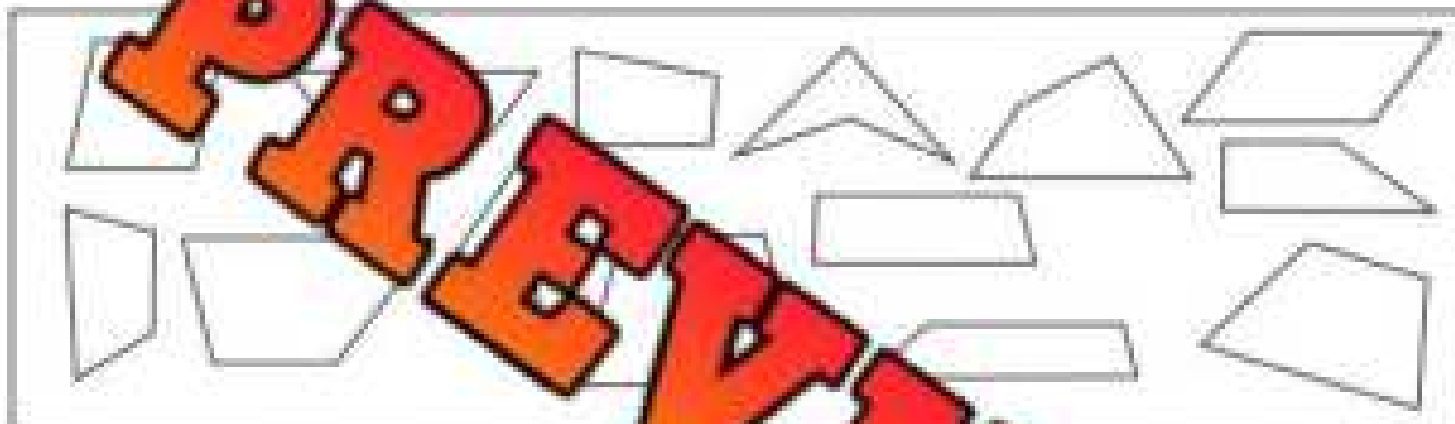
2 pairs of parallel lines



1 pair of parallel lines

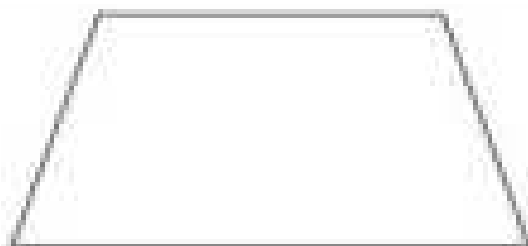
This means parallelograms, rectangles, and squares are all considered trapezoids.

**Part 1** Circle the trapezoids in the collection of quadrilaterals below.

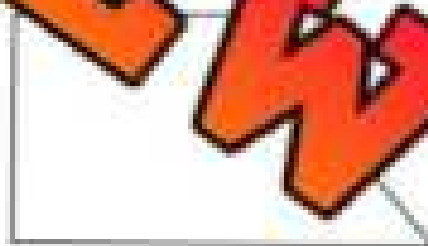


**Part 2** Describe the trapezoids below using the same terms as in Part 1.

1)



2)



Intersect at Midpoint?      Y / N

Intersect at Midpoint?      Y / N

Intersect at Right Angle?      Y / N

Intersect at Right Angle?      Y / N

Diagonals Same Length?      Y / N

Diagonals Same Length?      Y / N

Circle the parallel lines above.

Circle the parallel lines above.

How many sides does the trapezoid have?

How many sides does the trapezoid have?

## Quadrilaterals - Kite

A kite can look like a traditional kite that we fly or a dart that has a reflex angle and a diagonal outside of its shape.



Traditional Kite



Dart

### Part 1

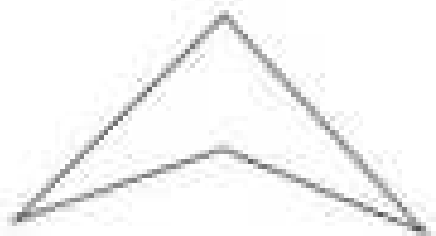
Colour or circle the kites in the collection of polygons below



### Part 2

Describe the kites below using their general properties

1)



2)



Intersect at Midpoint?

Y / N

Intersect at Midpoint?

Y / N

Intersect at Right Angle?

Y / N

Intersect at Right Angle?

Y / N

Diagonals Same Length?

Y / N

Diagonals Same Length?

Y / N

Circle the perpendicular lines

Circle the perpendicular lines

Put a square on the intersecting lines

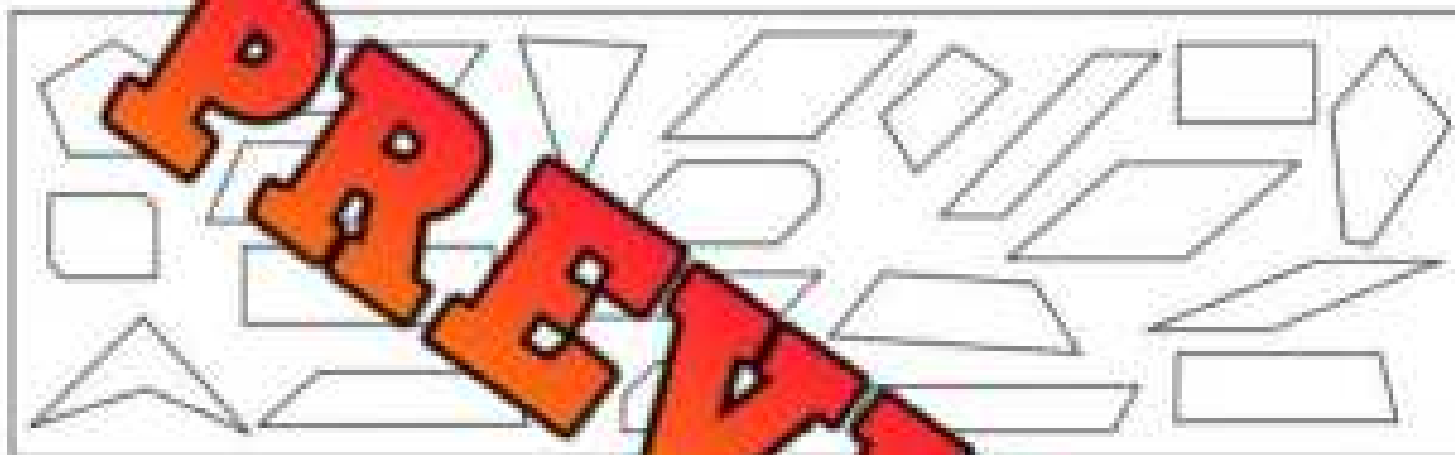
Put a square on the intersecting lines

## Quadrilaterals - Parallelogram

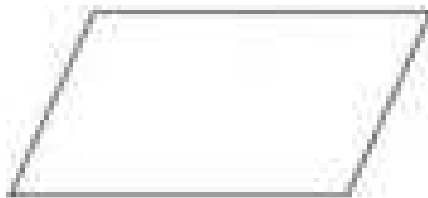

A parallelogram is a trapezoid with two pairs of parallel sides and congruent opposite sides.

Parallelogram       Rectangle       Rhombus       Square

**Part 1** Colour or circle the parallelograms in the collection of polygons below



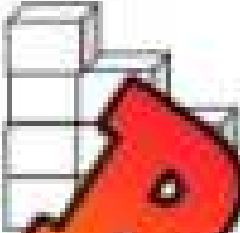
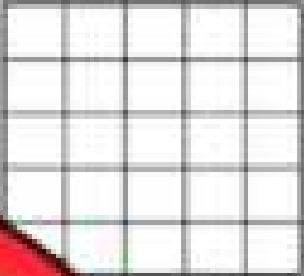
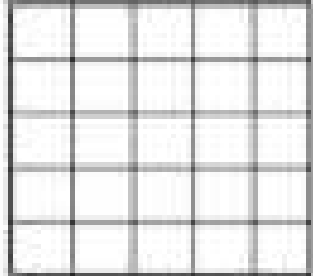
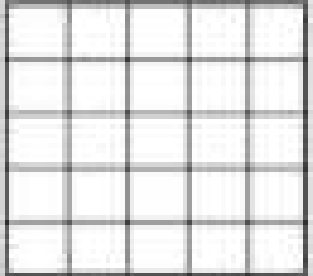
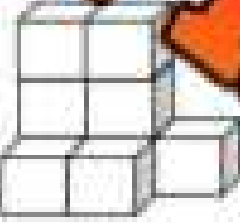
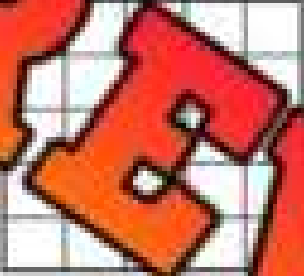
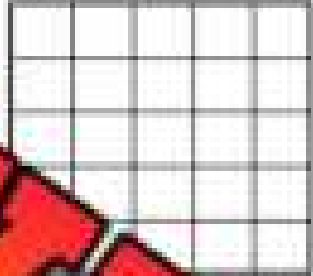
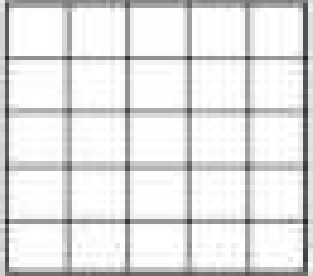
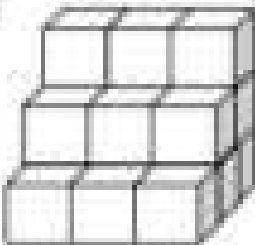
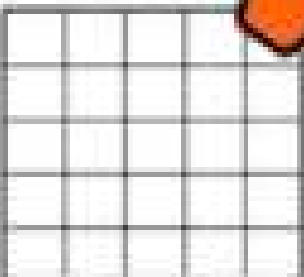
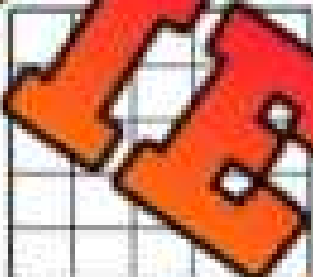
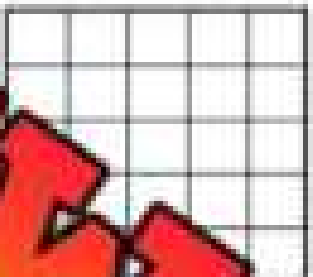
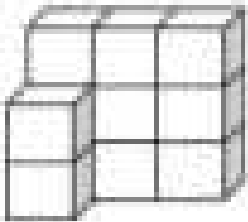
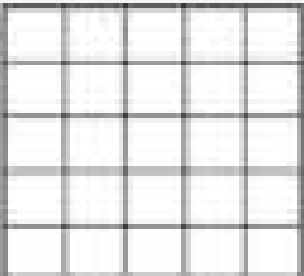
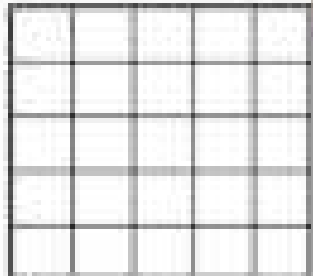
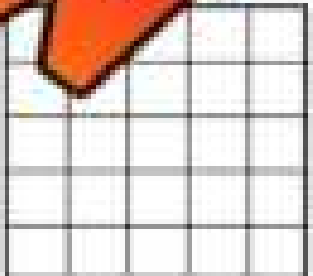
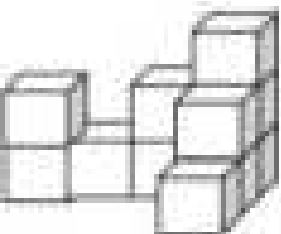
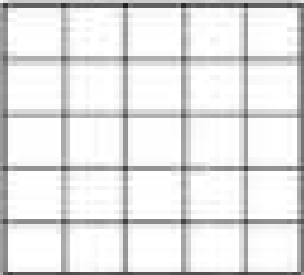
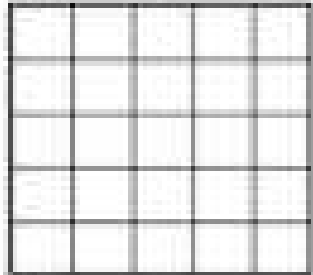
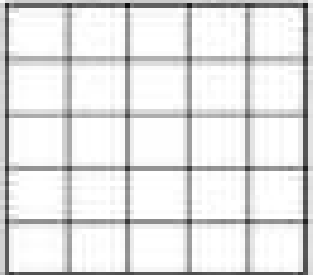
**Part 2** Describe the parallelograms below in terms of their properties

<p>1)</p> 	<p>2)</p> 
Intersect at Midpoint?      Y N	Intersect at Midpoint?      Y N
Intersect at Right Angle?      Y N	Intersect at Right Angle?      Y N
Diagonals Same Length?      Y N	Diagonals Same Length?      Y N
Circle the parallel lines	Circle the parallel lines
Put a square on the intersecting lines	Put a square on the intersecting lines

# Drawing Top, Front, and Side Views of Objects

**Questions**

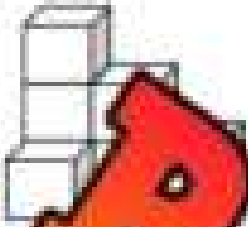
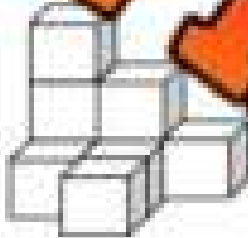
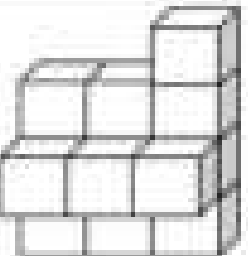
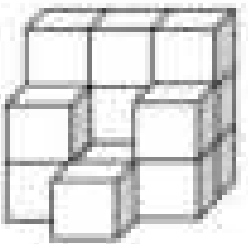
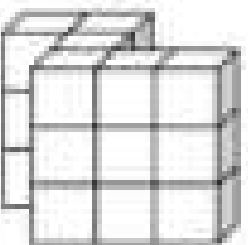
Drawing the top, front, and side view of the objects below

Original Shape	Top View	Front View	Side View
1) 			
2) 			
3) 			
4) 			
5) 			

# Drawing Top, Front, and Side Views of Objects

**Questions**

Drawing the top, front, and side view of the objects below

Original Shape	Top View	Front View	Side View
1) 			
2) 			
3) 			
4) 			
5) 			

PREVIEW

# Exit Cards

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

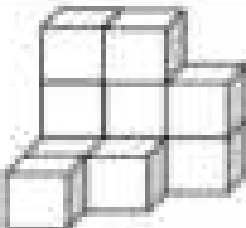
Name: \_\_\_\_\_

**Questions:** Drawing the top, front, and side view of the objects below.

Original Shape	Top View	Front View	Side View
			

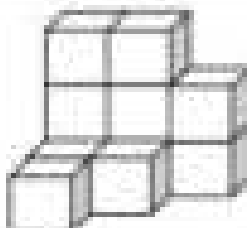
Name: \_\_\_\_\_

**Questions:** Drawing the top, front, and side view of the objects below.

Original Shape	Top View	Front View	Side View
			

Name: \_\_\_\_\_

**Questions:** Drawing the top, front, and side view of the objects below.

Original Shape	Top View	Front View	Side View
			

# Drawing Top, Front, and Side Views of Objects

**Instruction**

Look at the front, top, and side views and circle the matching 3D object

1) Top View	Front View	Side View

2) Top View	Front View	Side View

3) Top View	Front View	Side View

4) Top View	Front View	Side View

5) Top View	Front View	Side View

6) Top View	Front View	Side View

**PREVIEW**

## Using a Coordinate System



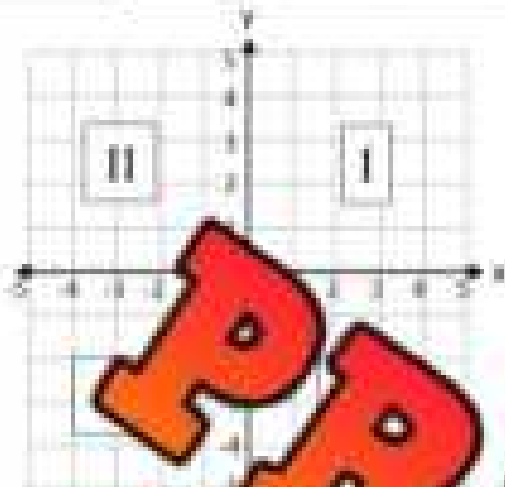
**Instructions:** Label the objects on the grid by using the number on the x-axis and the number on the y-axis.

Symbol	Coordinates (x, y)
	(9, 9)
	(   ,   )
	(   ,   )
	(   ,   )
	(   ,   )
	(   ,   )
	(   ,   )

Symbol	Coordinates (x, y)
	(   ,   )
	(   ,   )
	(   ,   )
	(   ,   )
	(   ,   )
	(   ,   )

## Four Quadrants - Cartesian Plane

**Part 1** Write which quadrant the points would be found



Coordinates (x, y)	Quadrant
(2, -4)	
(5, 4)	
(-4, -5)	
(-2, 3)	
(5, 2)	

**Part 2** Write your own coordinate point that could be found in the quadrant.

Quadrant	Coordinates (x, y)
Quadrant I	
Quadrant II	
Quadrant III	
Quadrant IV	
Quadrant III	
Quadrant II	
Quadrant IV	
Quadrant I	

**Part 3** Which quadrant number is associated with the descriptions below

	Description	Quadrant
1)	Both positive values	
2)	Both negative values	
3)	An x positive value and y negative value	
4)	An x negative value and y positive value	

## Using 4 Quadrants on a Cartesian Plane



### Instructions

Write the letters on the grid according to the coordinates.

Letter	Coordinates (x, y)
A	(-2, 4)
B	(-6, 6)
C	(8, -4)
D	(7, 4)
E	(-2, -2)

Letter	Coordinates (x, y)
F	(-5, 3)
G	(8, 8)
H	(-6, 1)
I	(3, -8)
J	(0, -7)

## Translating Objects on a Cartesian Grid



### Instructions

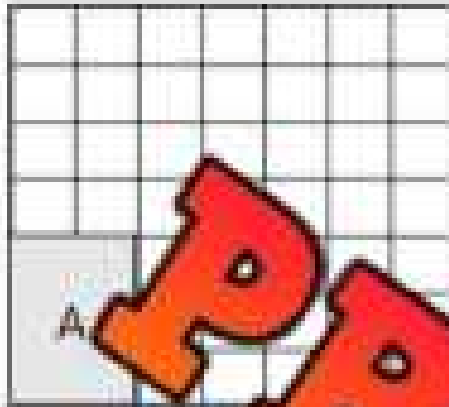
Write the coordinates of the animal and the translations.

Symbols	Coordinates	
→	$(-6, 8) \rightarrow (4, 4)$	Go right 10 and down 4
→	$(\quad, \quad) \rightarrow (\quad, \quad)$	
→	$(\quad, \quad) \rightarrow (\quad, \quad)$	
→	$(\quad, \quad) \rightarrow (\quad, \quad)$	
→	$(\quad, \quad) \rightarrow (\quad, \quad)$	
→	$(\quad, \quad) \rightarrow (\quad, \quad)$	

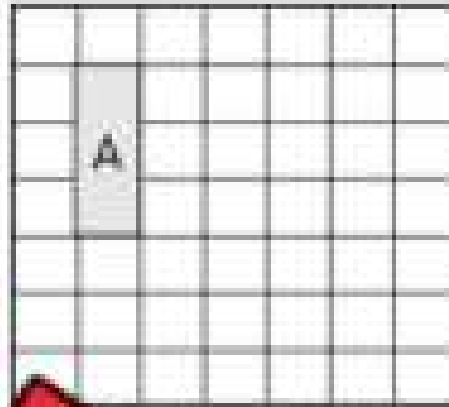
## Performing Translation

**Questions**

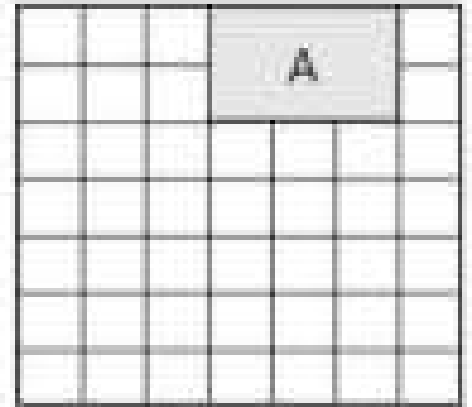
Draw the new shape after reading the 3 steps



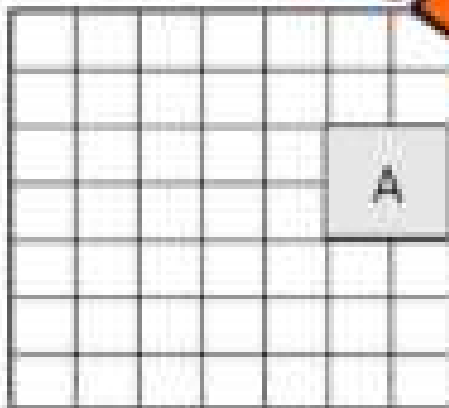
1)  $3 \downarrow, 4 \rightarrow, 1 \downarrow$



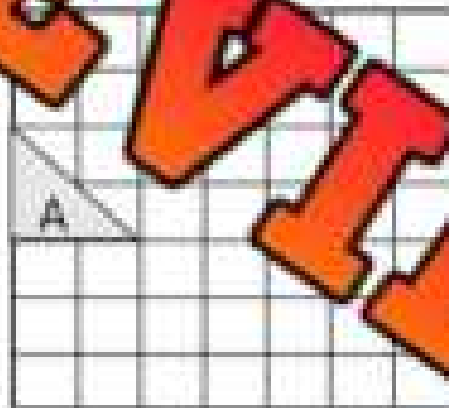
2)  $1 \downarrow, 4 \rightarrow, 1 \downarrow$



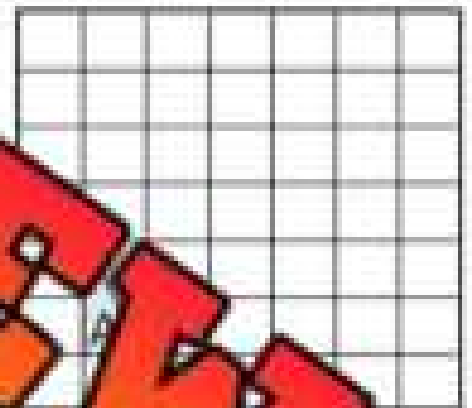
3)  $3 \downarrow, 2 \leftarrow, 2 \downarrow$



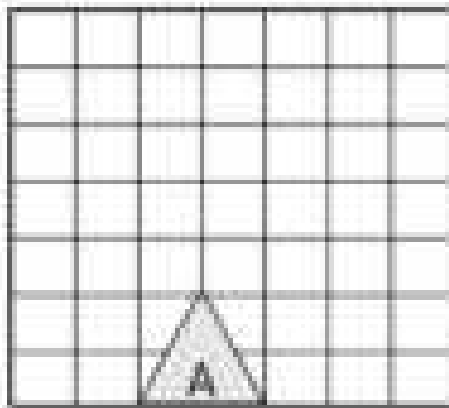
4)  $3 \downarrow, 4 \leftarrow, 1 \uparrow$



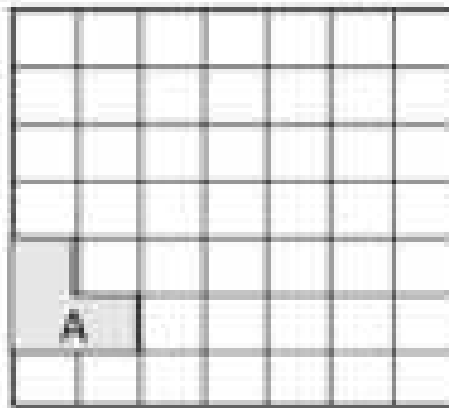
5)  $2 \downarrow, 4 \rightarrow, 3 \uparrow$



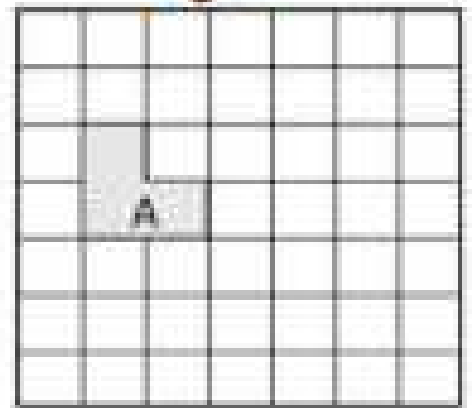
6)  $2 \downarrow, 1 \rightarrow, 1 \downarrow$



7)  $4 \uparrow, 2 \rightarrow, 3 \leftarrow$



8)  $4 \uparrow, 4 \rightarrow, 5 \downarrow$



9)  $3 \downarrow, 3 \rightarrow, 2 \uparrow$

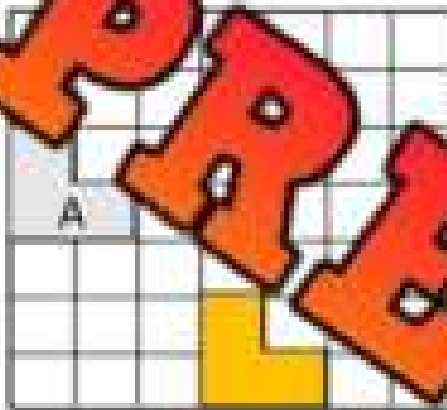
# Exit Cards

Cut Out

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

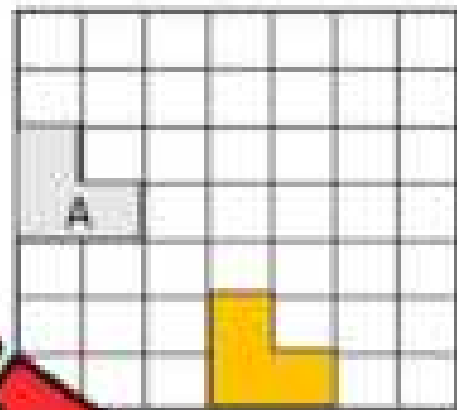
Name: \_\_\_\_\_

Describe the translation below. Shape A is the original object.



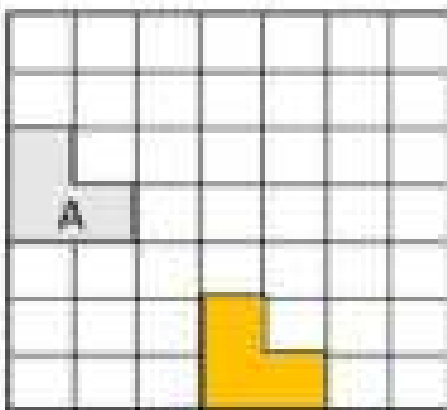
Name: \_\_\_\_\_

Describe the translation below. Shape A is the original object.



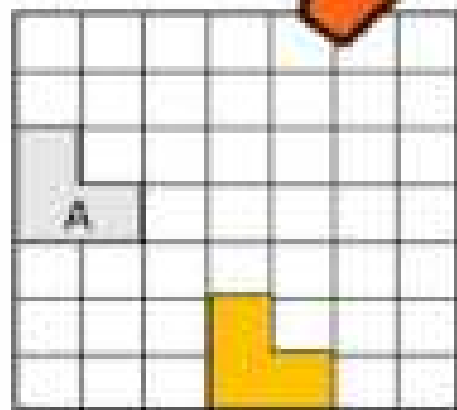
Name: \_\_\_\_\_

Describe the translation below. Shape A is the original object.



Name: \_\_\_\_\_

Describe the translation below. Shape A is the original object.



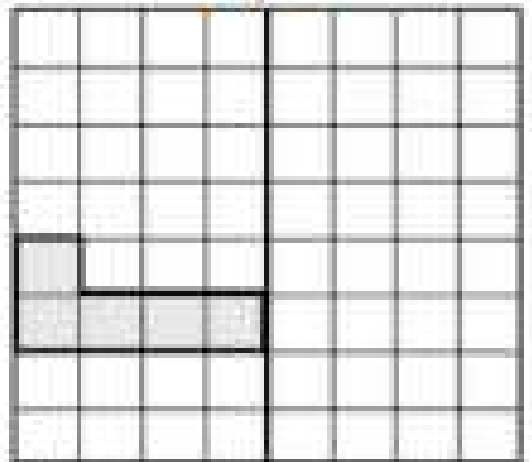
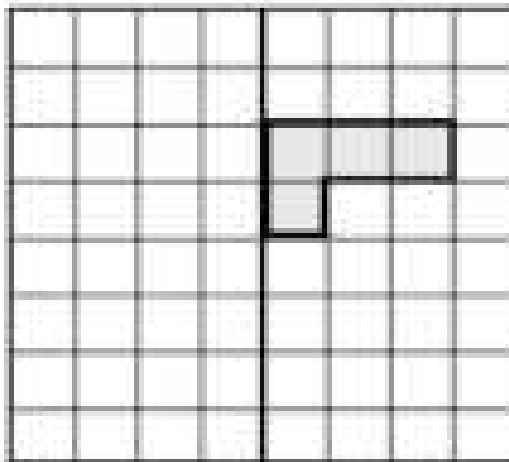
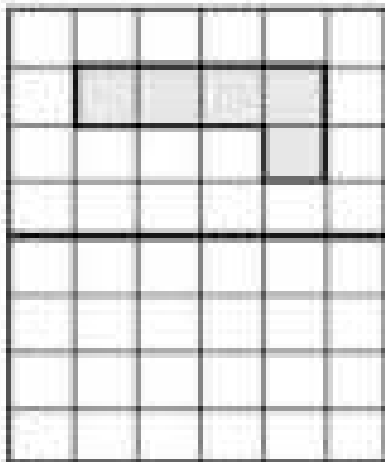
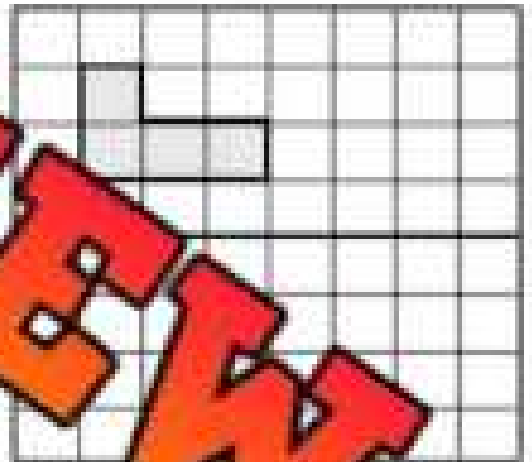
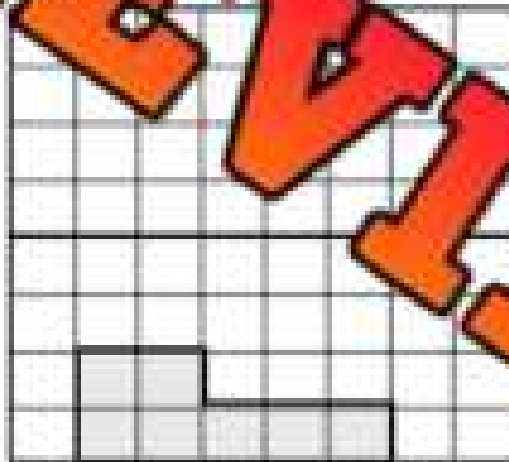
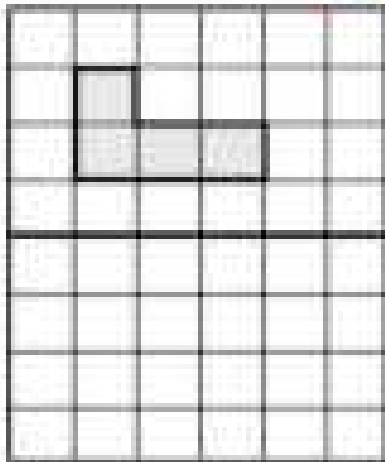
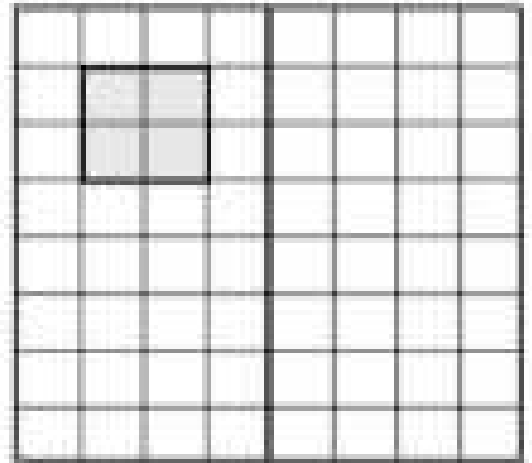
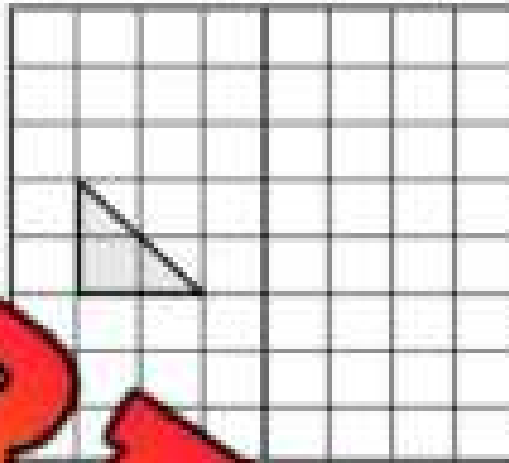
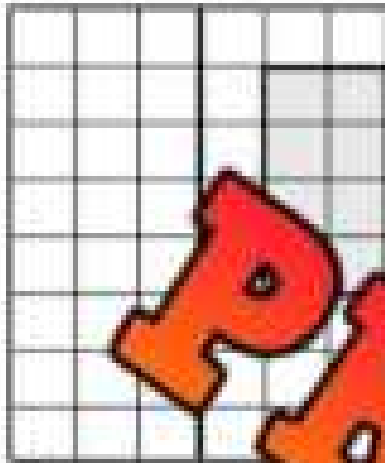
**PREVIEW**

Name: \_\_\_\_\_

# Drawing Reflections

## Instructions

Reflect the shapes across the mirror line

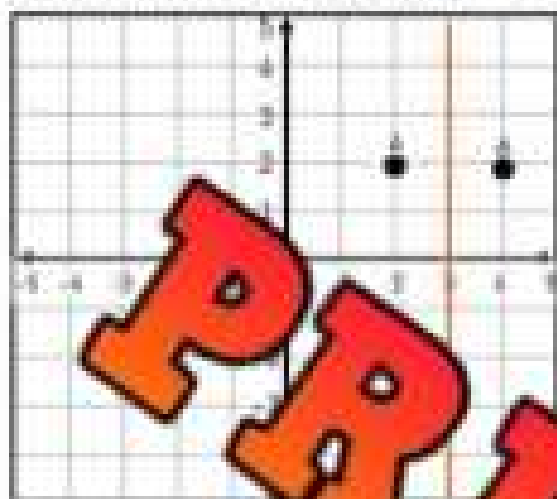
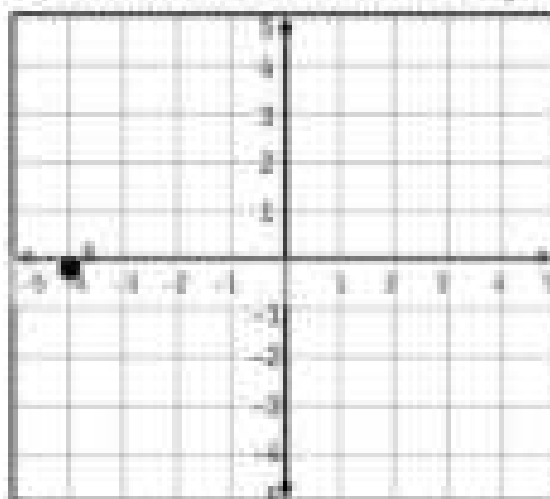
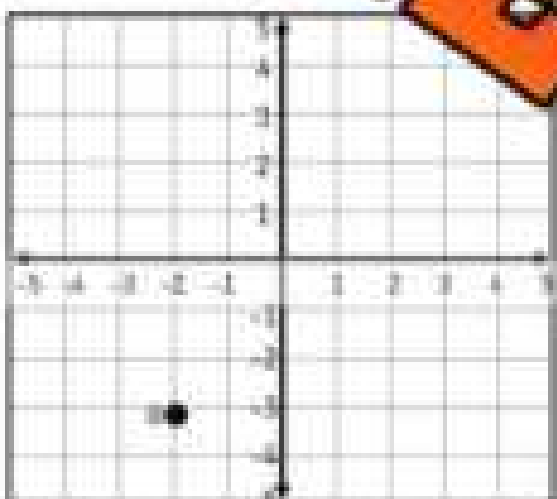
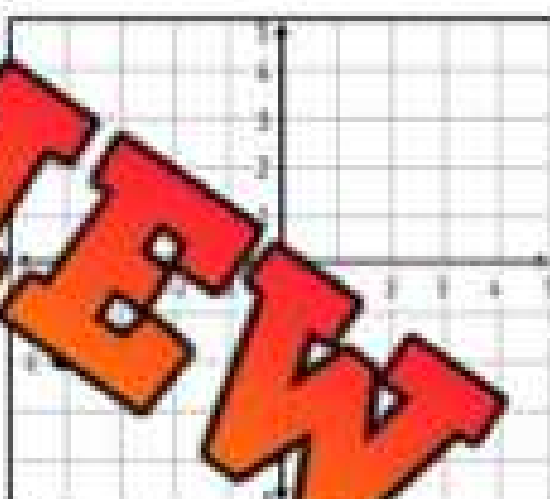
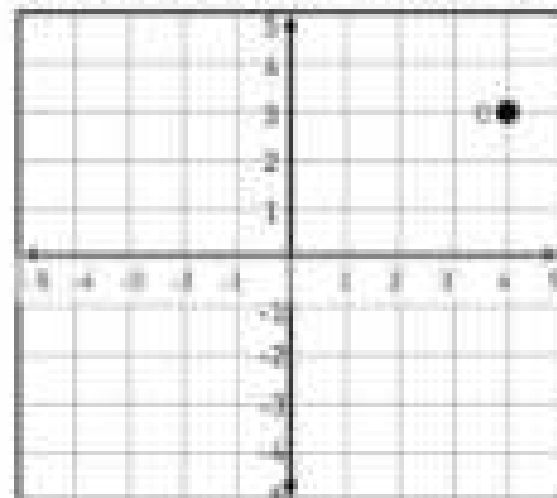


**PREVIEW**

## Reflecting a Point Using a Mirror Line

**Instructions**

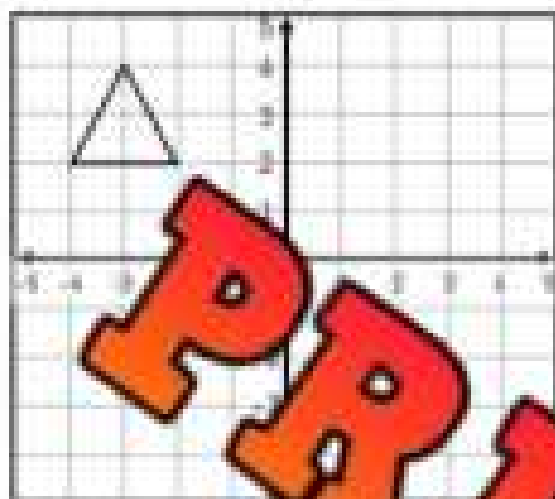
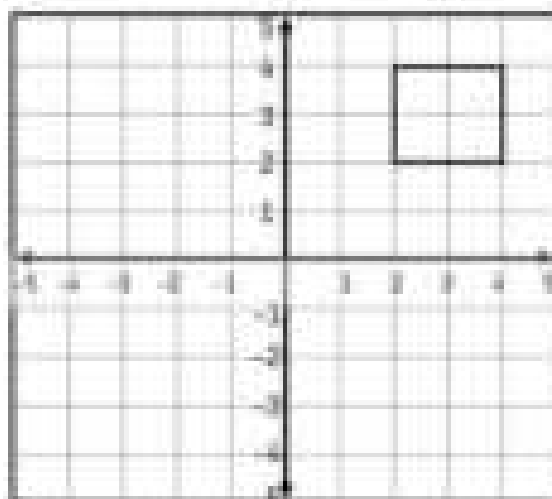
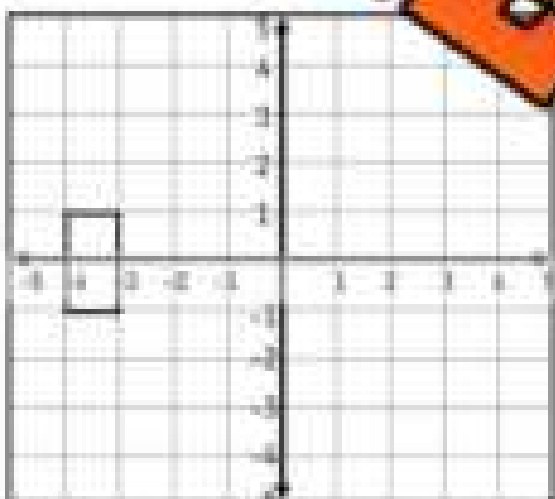
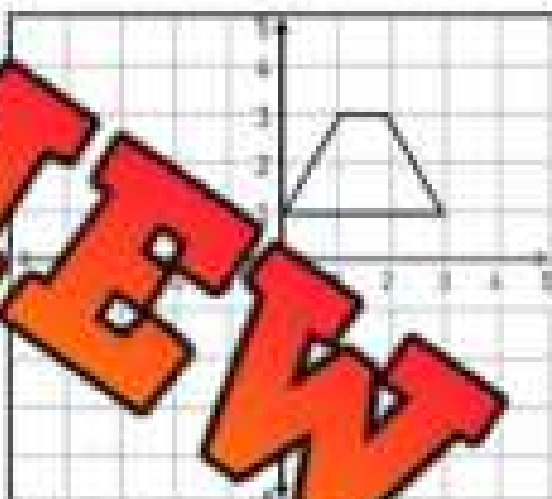
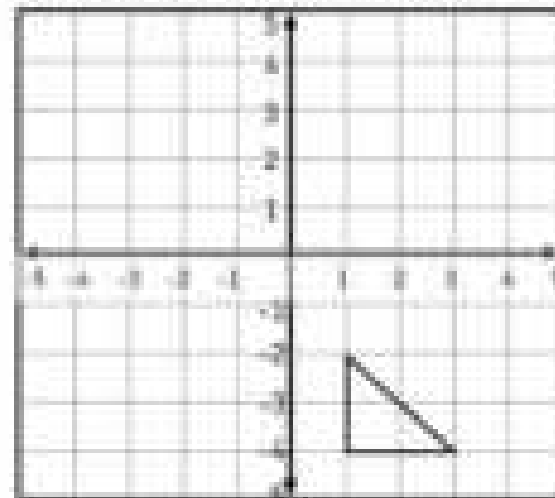
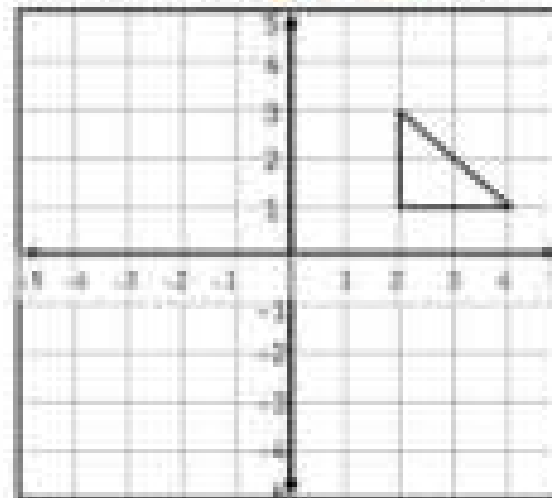
Graph the new position of each point. The first one is done for you.

1) Reflection across the line  $x = 3$ 2) Reflection across the line  $y = 2$ 3) Reflection across the line  $x = -2$ 4) Reflection across the line  $x = -2$ 5) Reflection across the line  $x = 1$ 6) Reflection across the line  $y = -3$ 

## Reflecting a Shape Using a Mirror Line

**Instructions**

Graph the new position of each shape after the given reflection

1) Reflection across the  $x$ -axis2) Reflection across the  $y$ -axis3) Reflection across the  $y$ -axis4) Reflection across the line  $x = -1$ 5) Reflection across the line  $y = -1$ 6) Reflection across the line  $x = 2$ 

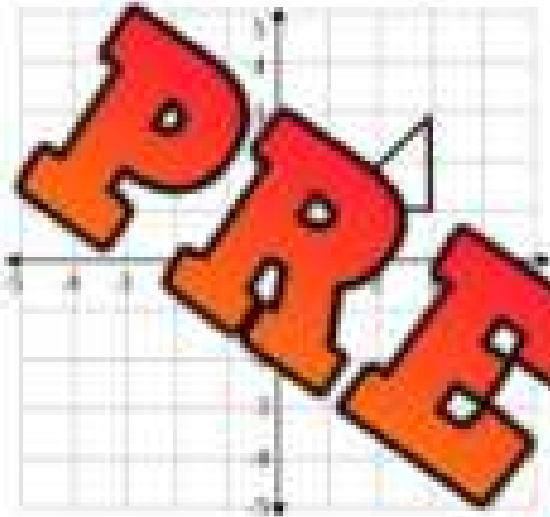
**PREVIEW**

# Exit Cards

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

Name: \_\_\_\_\_

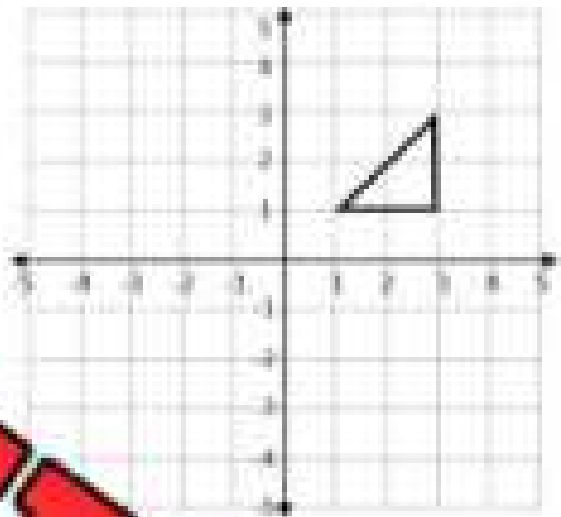
Graph the new position of the given shape



Reflection across the line  $x = -1$

Name: \_\_\_\_\_

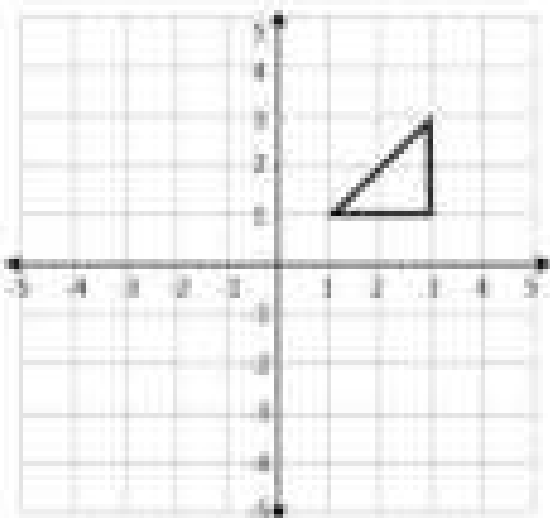
Graph the new position of the given shape



Reflection across the line  $x = 1$

Name: \_\_\_\_\_

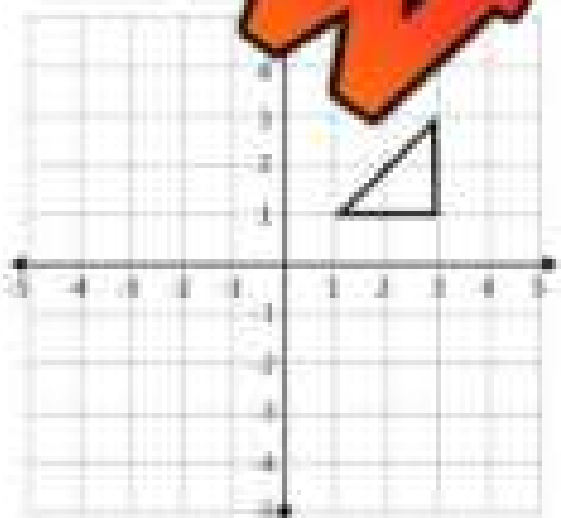
Graph the new position of the given shape



Reflection across the line  $x = 1$

Name: \_\_\_\_\_

Graph the new position of the given shape



Reflection across the line  $x = -1$

**PREVIEW**

## Clockwise and Counterclockwise Rotations

Rotations can either be clockwise or counterclockwise.

A clockwise rotation moves the same way the minute, second, and hour hands move on a clock.

A counterclockwise rotation moves the opposite way of a clockwise turn.

We can rotate things a lot or a little. Check out the three turns below.

360°  
rotation



180°  
rotation


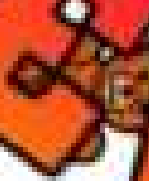










90°  
rotation



Instructions

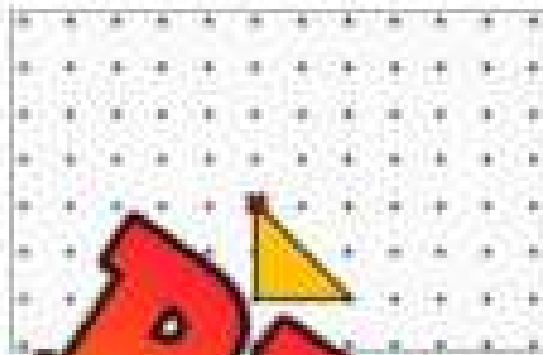
What object move? Circle the correct answer

1)			<input type="radio"/> Clockwise 90° rotation <input type="radio"/> Clockwise 180° rotation <input type="radio"/> Counterclockwise 90° rotation
2)			<input type="radio"/> Clockwise 90° rotation <input type="radio"/> Clockwise 180° rotation <input type="radio"/> Counterclockwise 90° rotation
3)			<input type="radio"/> Clockwise 90° rotation <input type="radio"/> Clockwise 180° rotation <input type="radio"/> Counterclockwise 360° rotation
4)			<input type="radio"/> Clockwise 90° rotation <input type="radio"/> Clockwise 180° rotation <input type="radio"/> Counterclockwise 90° rotation
5)			<input type="radio"/> Clockwise 90° rotation <input type="radio"/> Counterclockwise 90° rotation <input type="radio"/> Counterclockwise 180° rotation

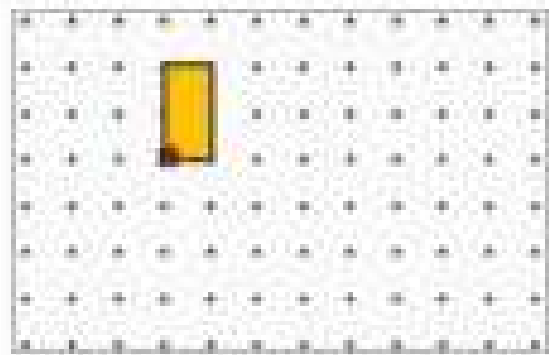
## Drawing Rotations

### Instructions

Rotate the shapes around the point marked .



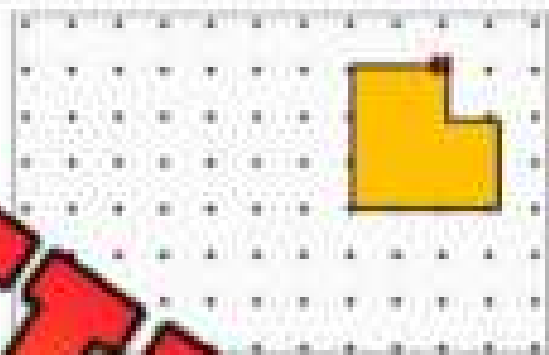
1) 90° clockwise rotation



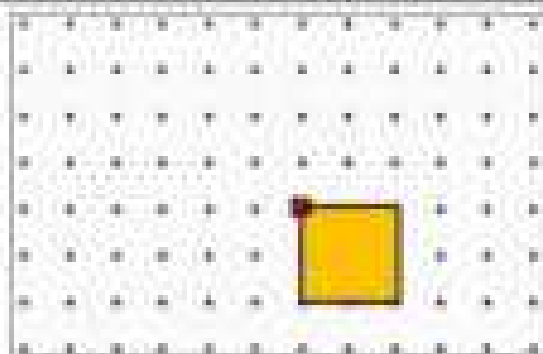
2) 180° counter-clockwise rotation



3) 180° clockwise rotation



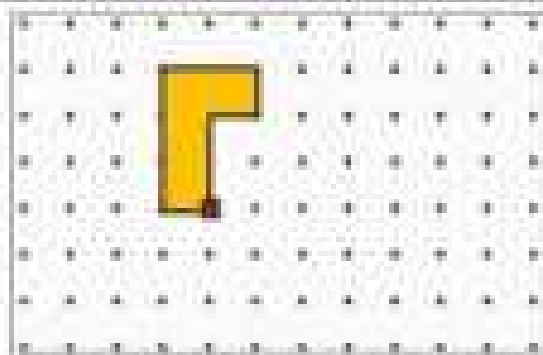
4) 360° clockwise rotation



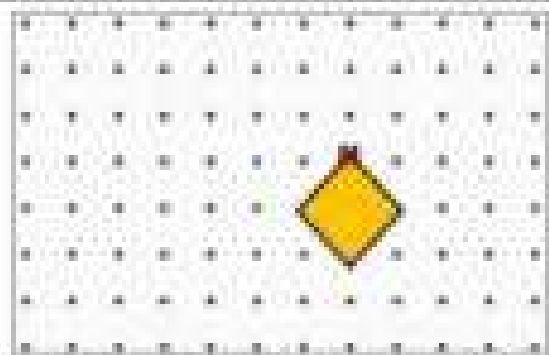
5) 90° counter-clockwise rotation



6) 180° counter-clockwise rotation



7) 90° clockwise rotation



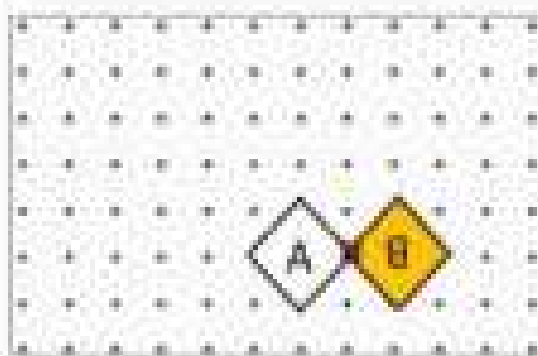
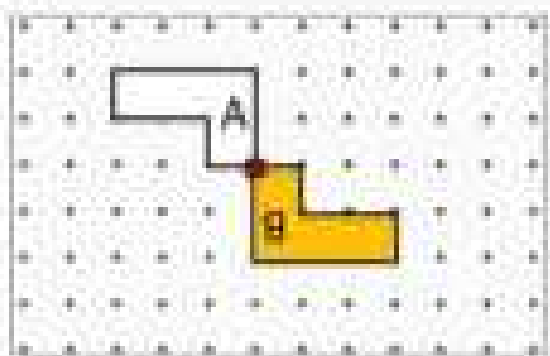
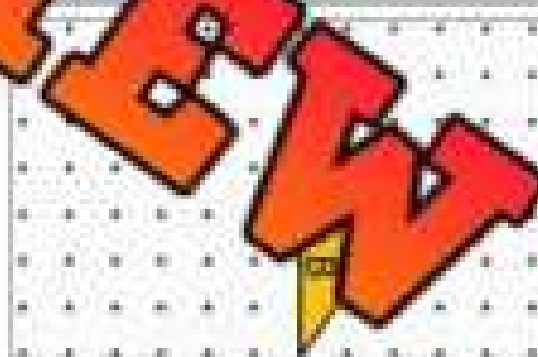
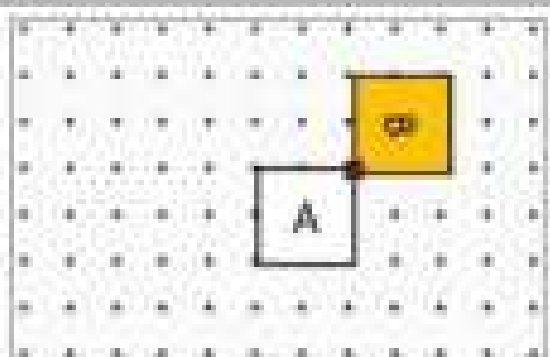
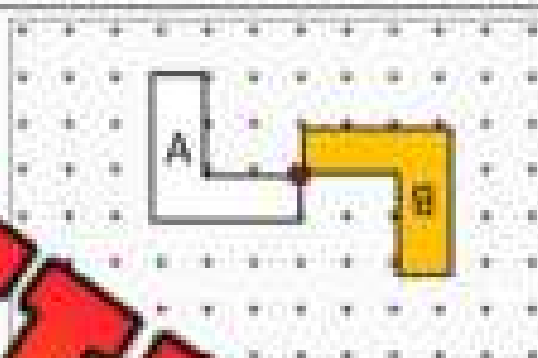
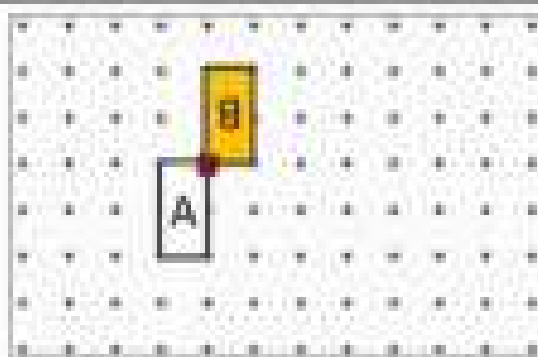
8) 180° counter-clockwise rotation

PREVIEW

## Describing Rotations

### Instructions

Describe the rotations. Shape A is the original shape.



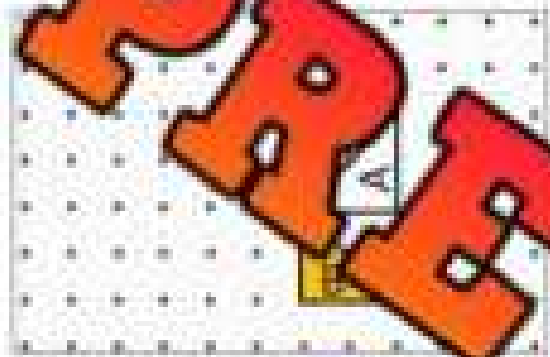
# Exit Cards

Cut Out

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

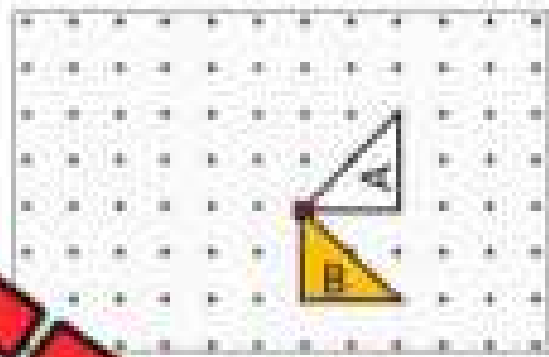
Name: \_\_\_\_\_

Describe the rotations. Shape A is the original.



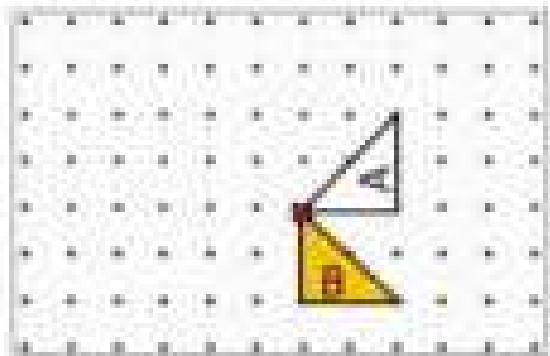
Name: \_\_\_\_\_

Describe the rotations. Shape A is the original shape.



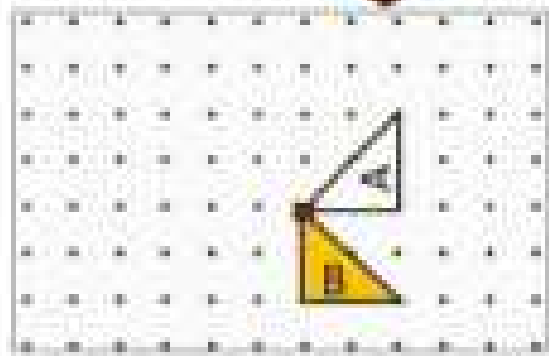
Name: \_\_\_\_\_

Describe the rotations. Shape A is the original shape.



Name: \_\_\_\_\_

Describe the rotations. Shape A is the original shape.

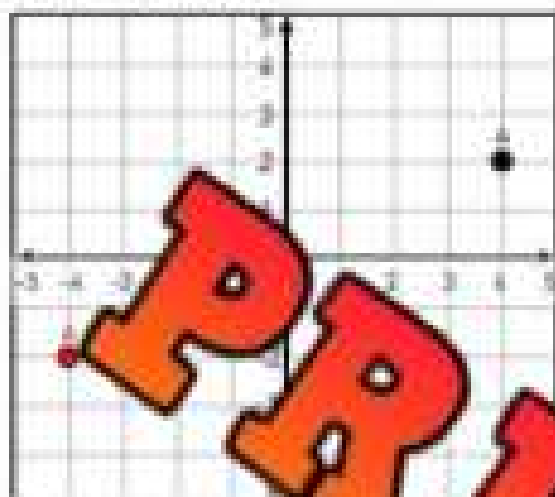


PREVIEW

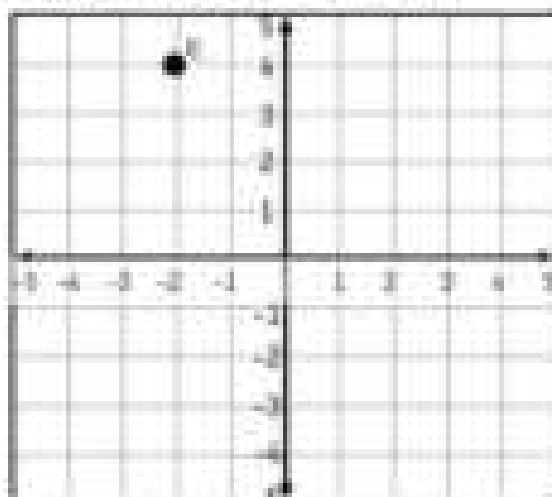
## Rotating a Point

**Instructions:** Graph the new position after rotating around the origin. The first one is done for you.

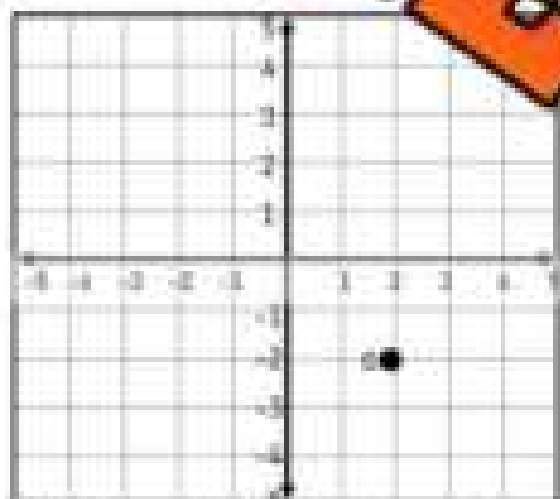
1)  $180^\circ$  rotation



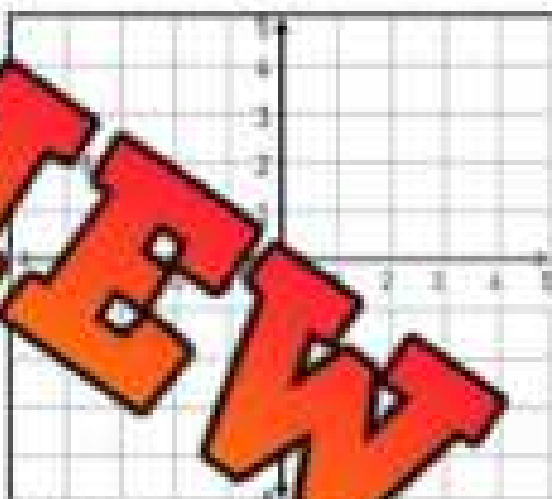
2)  $90^\circ$  clockwise rotation



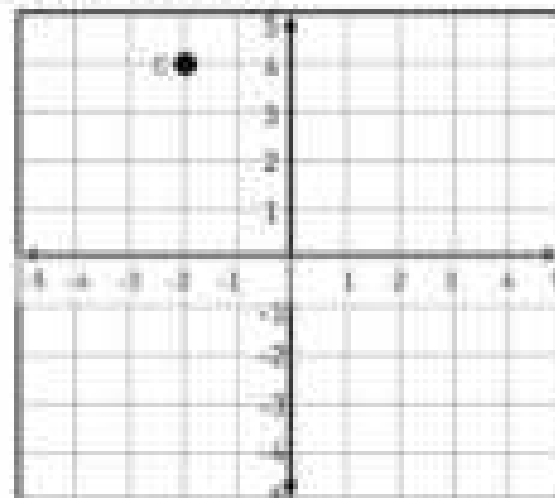
3)  $90^\circ$  counterclockwise



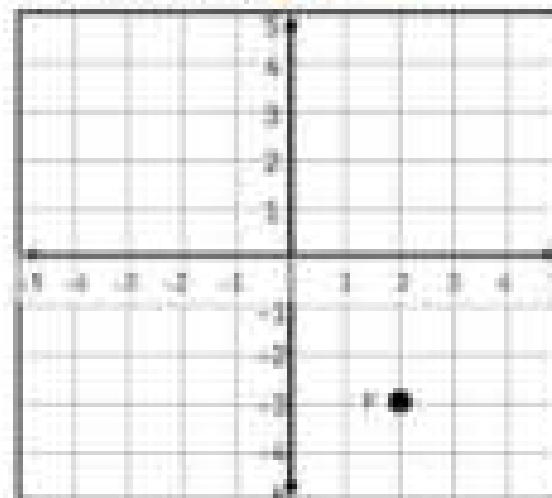
4)  $90^\circ$  clockwise rotation



5)  $180^\circ$  rotation



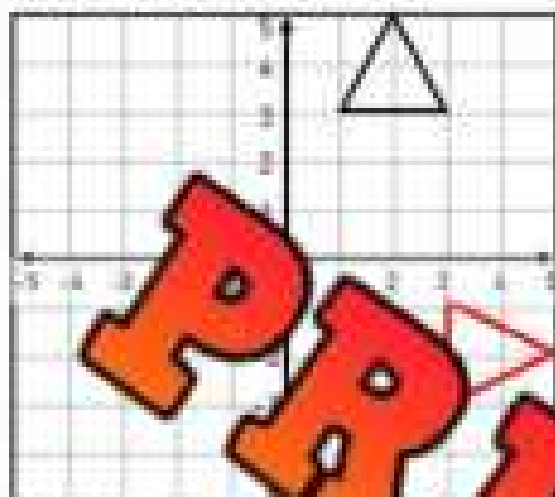
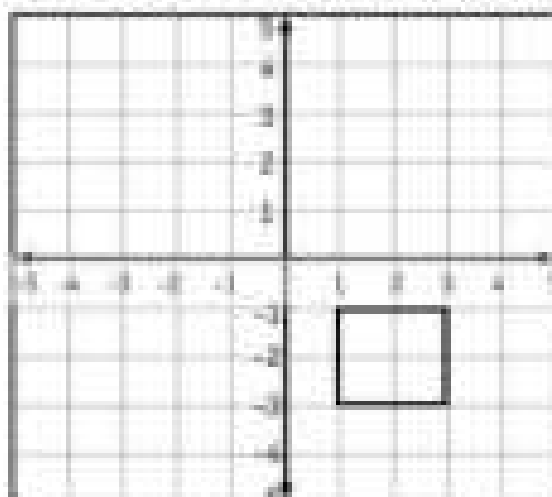
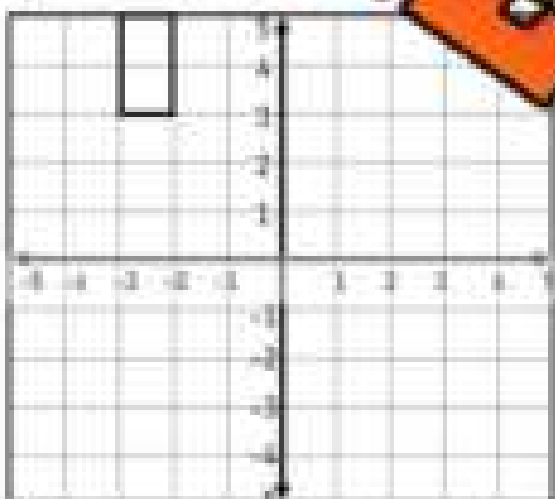
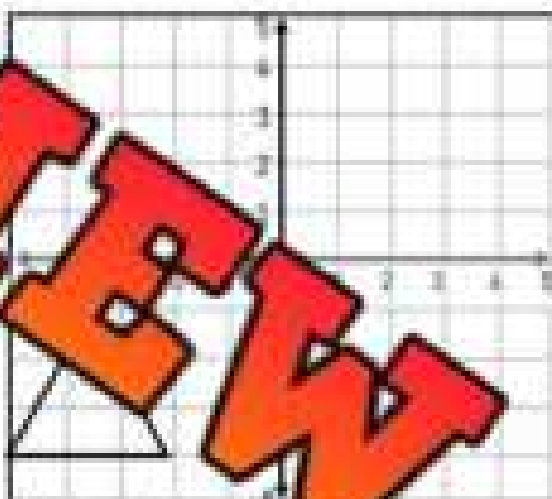
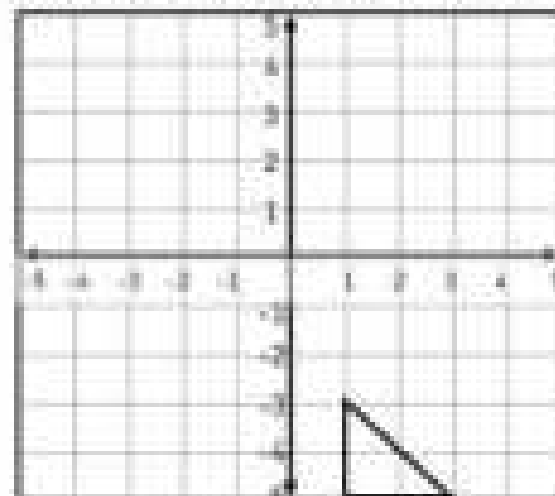
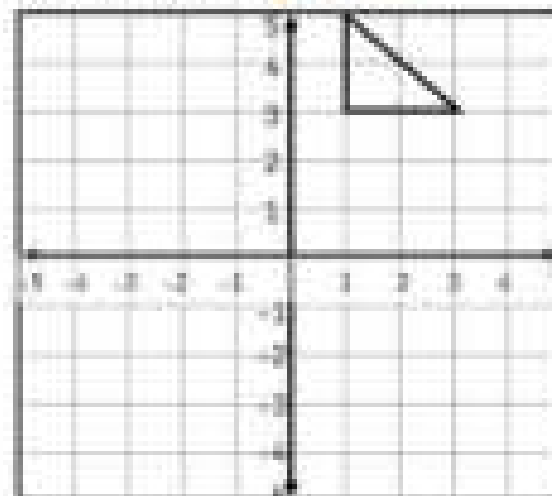
6)  $360^\circ$  rotation



# Rotating Shapes

**Instructions**

Graph the new position of each shape after the given rotation

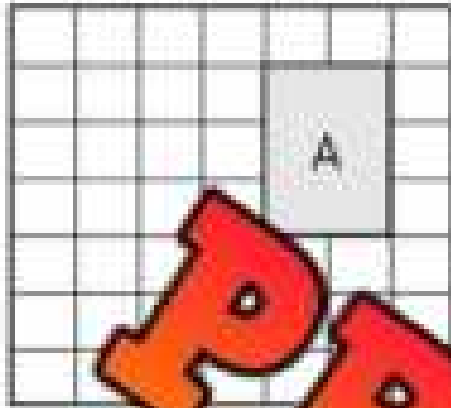
1)  $90^\circ$  clockwise rotation2)  $90^\circ$  counterclockwise rotation3)  $180^\circ$  rotation4)  $90^\circ$  clockwise rotation5)  $90^\circ$  counterclockwise rotation6)  $360^\circ$  rotation

**PREVIEW**

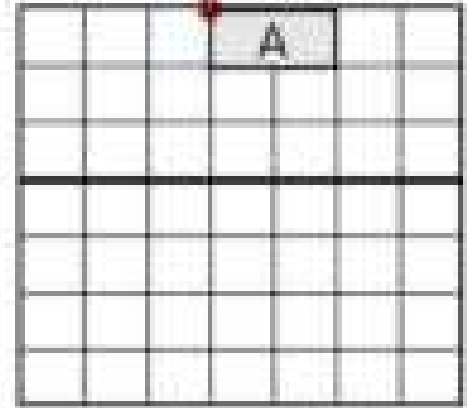
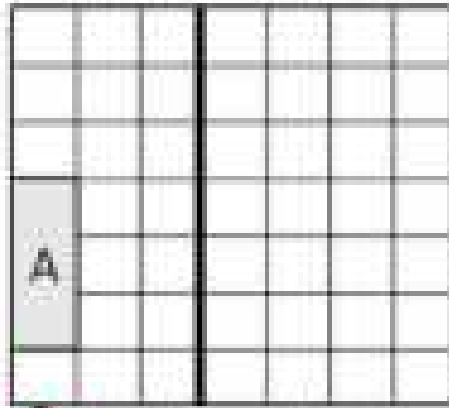
## Performing Multiple Transformations

### Instructions

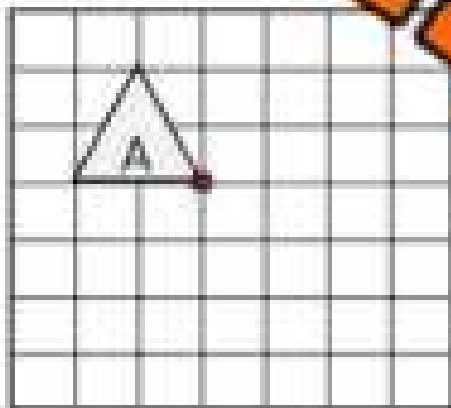
Complete the following combination of transformations



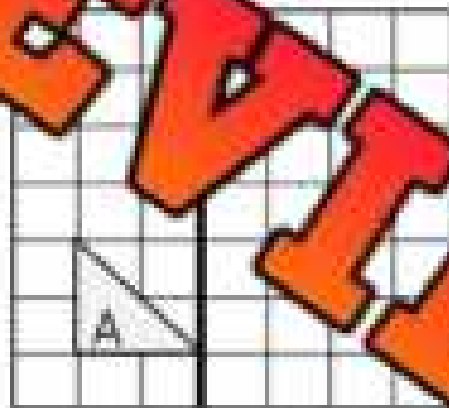
1)  $180^\circ$  rotation, reflect, translate up 3



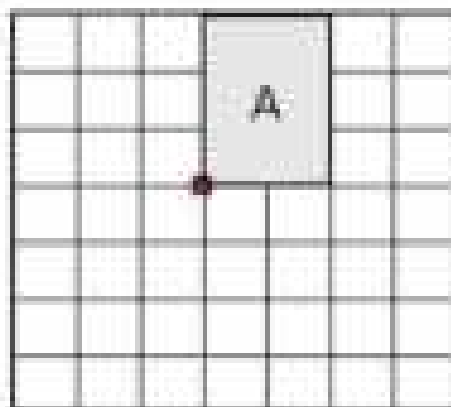
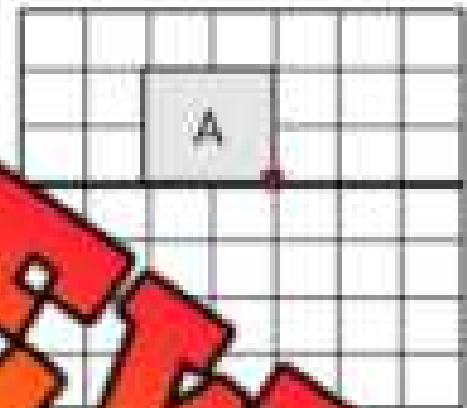
3) Rotate  $90^\circ$  counterclockwise, reflect



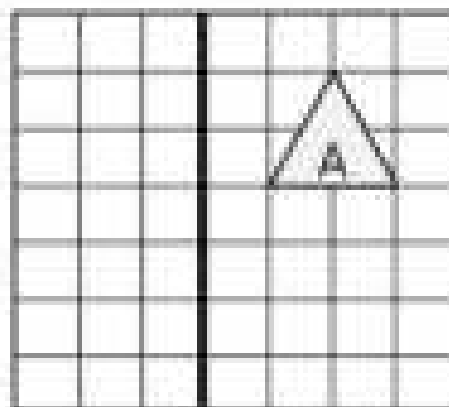
6)  $90^\circ$  clockwise rotation, translate left 2



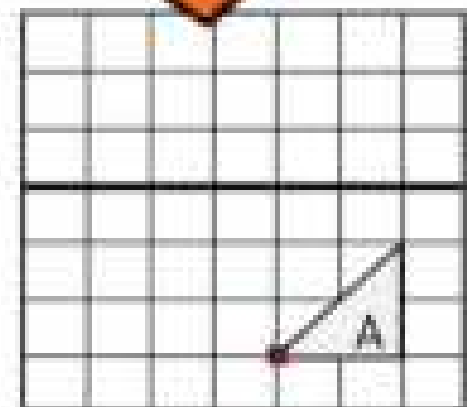
5) Translate up 3, reflect



7)  $180^\circ$  rotation, translate right 3



8) Reflect, translate down 3


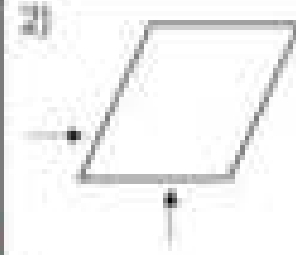
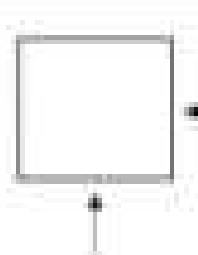
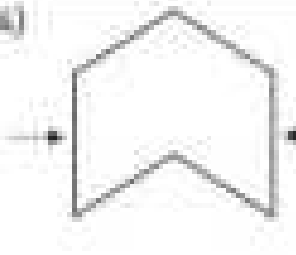


9) Rotate  $90^\circ$  counterclockwise and reflect

Name: \_\_\_\_\_

## Geometry Test

**Part 1** What is the relationship between the lines – Intersecting, Perpendicular, or Parallel?

1) 	2) 	3) 	4) 

**Part 2** Sort the angles into categories below



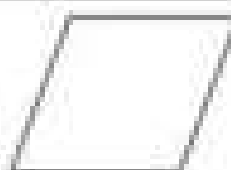

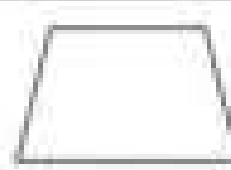






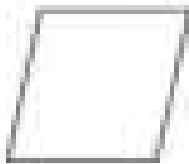
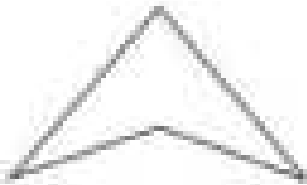
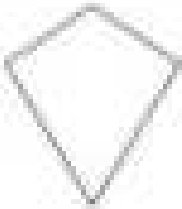

Angles	Right Angle	Obtuse	Reflex
Letters			

**Part 3** Draw the diagonal lines on the quadrilaterals and answer the questions

1) 	2) 	3) 
Name: _____	Name: _____	Name: _____
Intersect at Midpoint?    Y   N	Intersect at Midpoint?    Y   N	Intersect at Midpoint?    Y   N
Intersect at Right Angle?   Y   N	Intersect at Right Angle?   Y   N	Intersect at Right Angle?   Y   N
Diagonals Same Length?   Y   N	Diagonals Same Length?   Y   N	Diagonals Same Length?   Y   N




## Part 4

Name the quadrilaterals and answer the questions

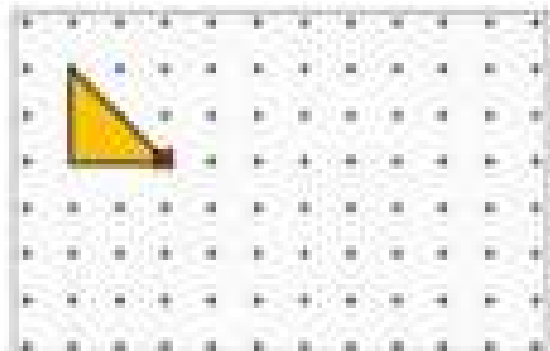
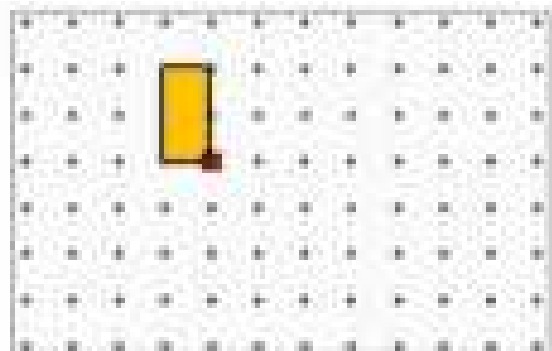
1) 	2) 	3) 
Name:	Name:	Name:
# of Lines of Symmetry:	# of Lines of Symmetry:	# of Lines of Symmetry:
Order of Rotational Symmetry:	Order of Rotational Symmetry:	Order of Rotational Symmetry:

## Part 5

Name the quadrilaterals below

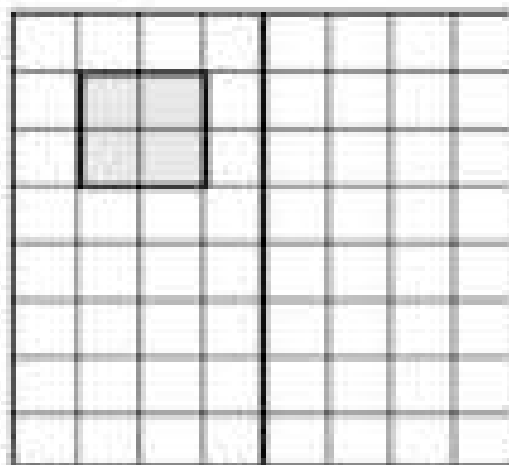
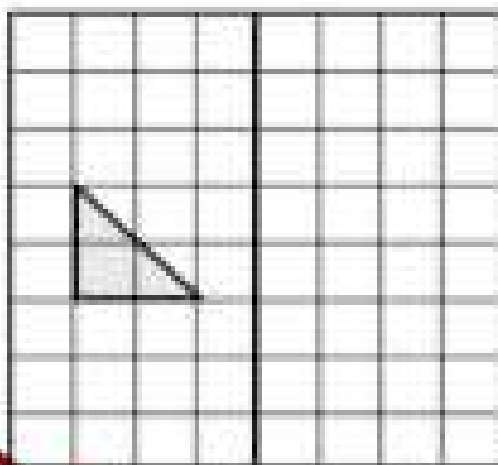
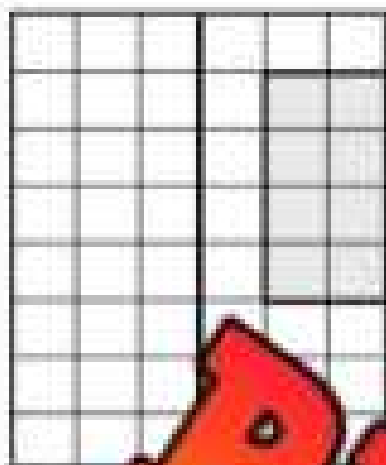
1) 	2) 	3) 
Kite	Trapezoid	Parallelogram

## Part 6

Rotate the shapes around the point marked 1)  $90^\circ$  counter-clockwise rotation2)  $180^\circ$  clockwise rotation

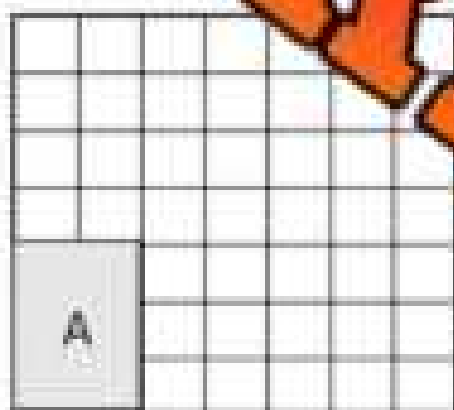
Part 7

Reflect the shapes across the mirror line

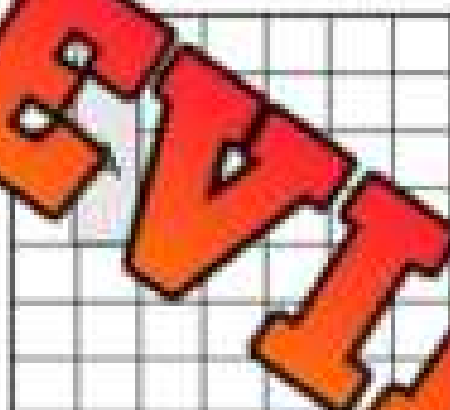


Part 8

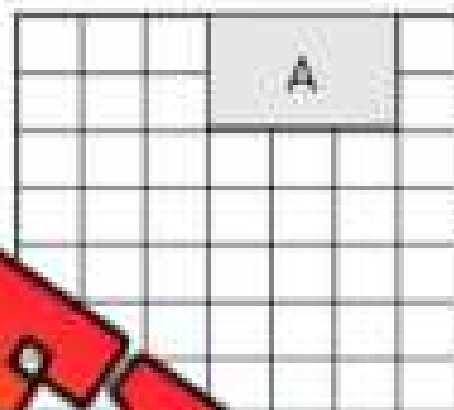
Draw the shape after reading the 3 steps



3 ↑, 4 →, 1 ↓

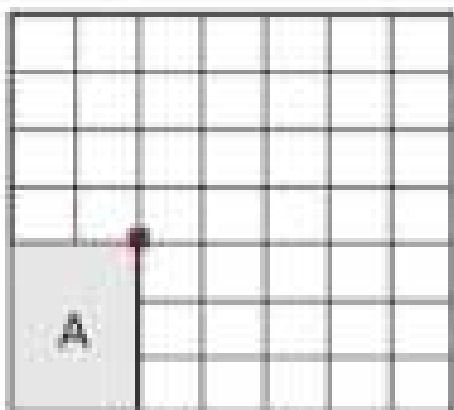


2 ↓, 4 →, 1 ↓

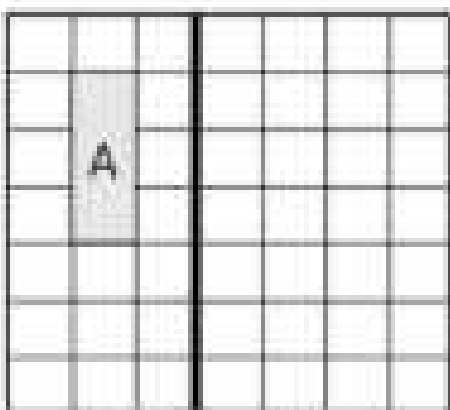


Part 9

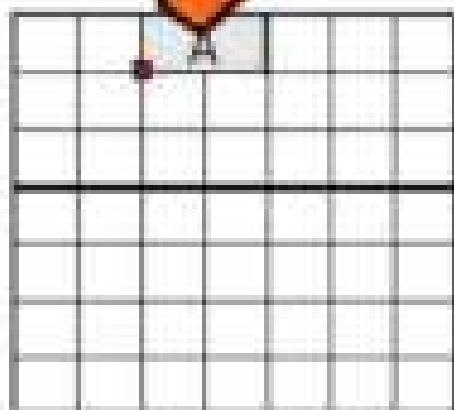
Complete the following combination of transformations



1) 180° rotation, translate right 2



2) Reflect and translate down 3



3) rotate 90° counterclockwise and reflect

**Grade 6**  
**E2 – Measurement**

	<b>Curriculum Expectations</b>	<b>Pages</b>
<b>E2.1</b>	measure length, area, mass, and capacity using the appropriate metric units, and solve problems that require converting smaller units to larger ones and vice versa	98 – 136
<b>E2.2</b>	use a protractor to measure and construct angles up to 360°; describe the relationship between angles that are formed clockwise and those that are measured counter-clockwise	137 – 166
<b>E2.3</b>	use the properties of complementary angles, supplementary angles, interior and exterior angles, and alternate exterior angles to solve for angle measures	167 – 186
<b>E2.4</b>	determine the areas of trapezoids, rhombuses, kites, and composite polygons by decomposing them into shapes with known areas	
<b>E2.5</b>	create and use nets to demonstrate the relationship between the faces of prisms and pyramids and their surface areas	222 – 235
<b>E2.4</b>	determine the surface areas of prisms and pyramids by calculating the areas of their two-dimensional faces and adding them together	236 – 250

PREVIEW

**Measuring in Centimetres****Part 1**

Use a ruler to measure the lines below

1)



\_\_\_\_\_ cm

2)



\_\_\_\_\_ cm

3)



4)



\_\_\_\_\_ cm

5)



6)



\_\_\_\_\_ cm

7)



\_\_\_\_\_ cm

\_\_\_\_\_ cm

**Part 2**

Draw a line that is the correct length

1)

8 cm

2)

7 cm

3)

5 cm

4)

3 cm

5)

4 cm

6)

9 cm

**PREVIEW**

# Exit Cards

Cut Out

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

Name: \_\_\_\_\_

1) Use a ruler to measure the lines below



2) Draw a line that is the correct length

5 cm

Name: \_\_\_\_\_

1) Use a ruler to measure the lines below



\_\_\_\_\_ cm

2) Draw a line that is the correct length

5 cm

Name: \_\_\_\_\_

1) Use a ruler to measure the lines below



\_\_\_\_\_ cm

2) Draw a line that is the correct length

5 cm

Name: \_\_\_\_\_

1) Use a ruler to measure the lines below



\_\_\_\_\_ cm





2) Draw a line that is the correct length

5 cm

**PREVIEW**

## Metric System Units – mm, cm, m, km

In Canada, we use the metric system. The metric system has 4 main units that we use to measure distances.

Millimetre (mm)	Centimetre (cm)	Metre (m)	Kilometre (km)
Used to measure small distances.	Used to measure small to medium distances.	Used to measure medium to long distances.	Used to measure long distances.
			

Question: Which measure would you use to measure the following distances?

1) The distance you can see		
2) The length of your hand		
3) The length of your eraser		
4) The length of your classroom		
5) The distance of a marathon run		
6) The distance of a 10 second race		
7) The length of your shoe		
8) The width your fingernail		
9) The height of the classroom door		
10) The length of your school		

## 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.



Examples:



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

Examples below

mm	cm	m	m	km
5		0.5	1500	
15		1.5		1.5
	2.5	250	5500	
	3.5	350	7500	
45				4.5
55		550	1500	
	6.5	650		6.5
75		7.5		7.5
85		850		8.5
	9.5	950		9.5

### Part 2

Convert the units of measurement below

1) 1.3m	_____ cm	5) 6.2m	_____ cm	9) 580cm	_____ m
2) 28mm	_____ cm	6) 57mm	_____ cm	10) 87mm	_____ cm
3) 2.7cm	_____ mm	7) 134mm	_____ cm	11) 8.42m	_____ cm
4) 5.3cm	_____ mm	8) 3.6cm	_____ mm	12) 330cm	_____ m



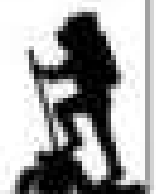
## Which is Longer?

**Part 1** Which distance is farther? Circle the longest distance.

1)	100.5m	500.8cm	1000.5mm	1.1km
2)	52.5cm	580mm	0.05km	51m
3)	50m	535cm	55m	0.05km
4)	5.1m	5.3m	5700mm	0.004km
5)	785cm	7.85m	8300mm	0.008m

**Part 2** Read the problem and solve. Show your work.

- Stephanie and Amanda measured the length of their rooms. Stephanie's room is 4.4m long and Amanda's is 4410mm long. Whose room is longer?
- Scott hit a home run that was 153.6m long. Luke hit a home run that travelled 0.153km long. Who hit the farther home run?
- Zoey measured the willow and maple tree in her yard. The willow tree was 418.6cm tall and the maple was 4.157m tall. Which tree is taller?
- Greg hiked 8.03km on Saturday and 8100.01m on Sunday. Which day did he hike farther?



## Memory Game: Matching Equivalent Units

### Objective

What are we learning about?

Students will practice converting and matching equivalent units of measurement, such as centimeters to millimeters and meters to centimeters, to enhance their understanding of metric conversions.

### Materials

What you will need for the activity.

- Set of Memory Game cards with units of measurement (see page 112)
- Tables or chairs to space out group to lay out their cards



### Instructions

How you will complete

1. Divide the class into groups of 3 or 4 students, each.
2. Give each group a set of Memory Game cards.
3. Have each group lay all the cards face down in a grid on a table.
4. Students take turns flipping over two cards at a time, trying to find a match with equivalent units of measurement.
5. If a student finds a match (e.g., 1 meter and 100 centimeters), they remove those cards from the grid and keep them.
6. If the cards do not match, they are turned back over, and the next student takes a turn.
7. The game continues until all the cards have been matched.
8. After the game, review the equivalent units of measurement with the class, ensuring students understand the conversions.

Cards

Memory Game Cards

300 centimeter

3000 millimeters

**PREVIEW**

60

6000 centimeters

753 centimeters

7530 millimeters

983 centimeters

9.83 meters

808 meters

80800 centimeters

Maths

Memory Game Cards

111 centimeters

1110 millimeters

54.5 meters

54.5 centimeters

88 kilometers

88 meters

0.018 meters

1.8 centimeters

33.77 centimeters

337.7 millimeters

**PREVIEW**

## Estimating Distance

### Questions

Circle which distance is the largest.

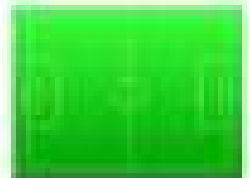
1) Length of a pencil

- a) 30cm
- b) 10mm
- c) 1km
- d) 10cm



2) Length of a soccer field

- a) 100m
- b) 500m
- c) 2km
- d) 500cm



3) Distance from Chicago to Toronto

- a) 10km
- b) 450km
- c) 500cm
- d) 500m

4) Length of a gym

- a) 15m
- b) 3m
- c) 300cm
- d) 10mm



5) Width of a computer monitor

- a) 3km
- b) 1m
- c) 30cm
- d) 20mm



6) Length of your shoe

- a) 20cm
- b) 20m
- c) 20mm
- d) 2m



7) Height of a desk

- a) 20km
- b) 2m
- c) 90cm
- d) 200mm



8) Height of an NBA player (in feet)

- a) 2km
- b) 2m
- c) 100cm
- d) 200mm



9) Length of a bus

- a) 1km
- b) 13m
- c) 300cm
- d) 2000mm



10) Width of an eraser on the end of a pencil

- a) 2km
- b) 2m
- c) 10cm
- d) 10mm



## Metric System Units – Capacity – Decimal Conversions

Millilitre (mL)	Litre (L)	Kilolitre (kL)
1000 mL = 1L	1000L = 1kL	1kL = 1000L
		

Part 1 Complete the tables below

mL	L	L	L	kL	L	kL
1000		1000		1000	1	1100
2000					2	1200
3000		3500	3.5		3	
	4	4500				1.3
	5	5500				1.4
6000		6500				1500
7000			7.5			
8000		8500		8000		1.6
	9		9.5			1.7
	10	10500		10000		1.9

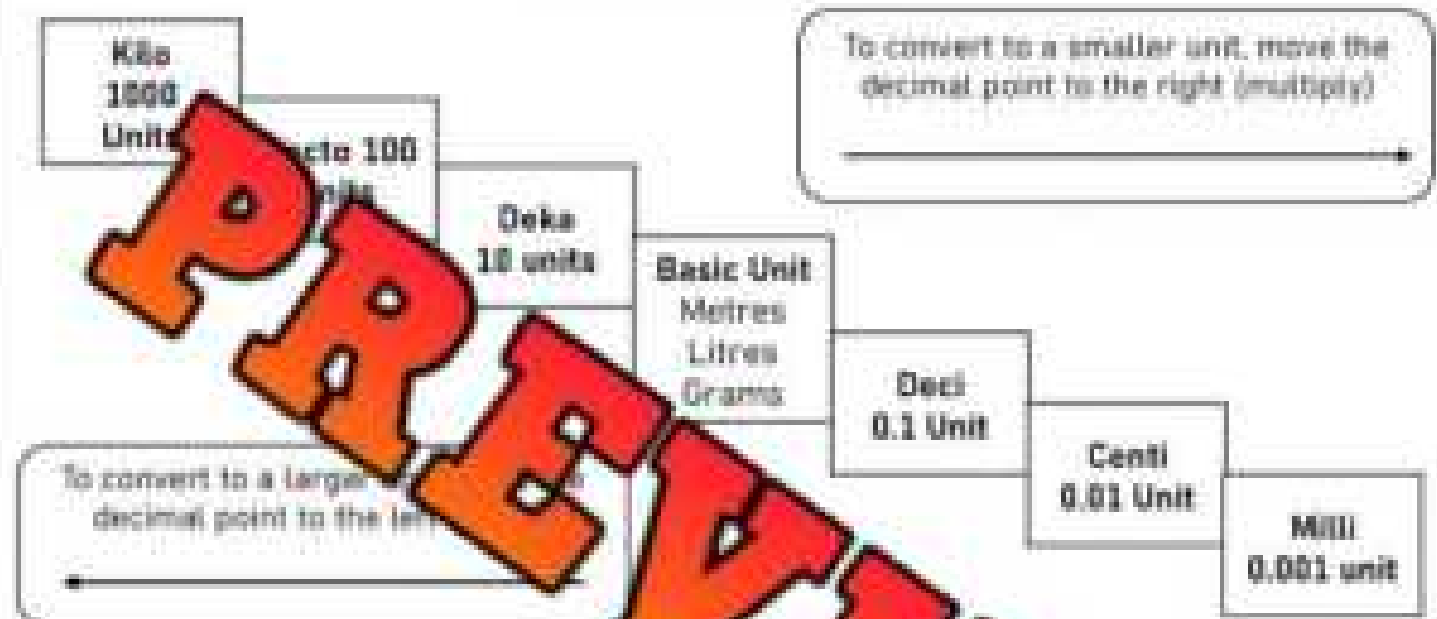
Part 2 Convert the units of measurement below

1) 1.7L	_____ mL	5) 6.4kL	_____ L	9) 4.5L	_____ mL
2) 5.4L	_____ mL	6) 4700mL	_____ L	10) 5500mL	_____ L
3) 8400mL	_____ L	7) 8400mL	_____ L	11) 4.5kL	_____ L
4) 3200L	_____ kL	8) 7.7kL	_____ L	12) 2500L	_____ kL

## Converting Units - Ladder Method

We can use the ladder method to convert any metric unit of measurement to another simply by following the rules below.

### Ladder Method



#### Instructions

1. Find your starting unit of measurement
2. Count the jumps to get to your ending unit of measurement
3. Move the decimal the number of jumps up or down  
 Moving Up = Left and Moving Down = Right

#### EXAMPLE

Convert 3.2 L to mL  
 L → dL → cL → mL  
 3 jumps down = (move decimal 3 right)

#### Practice

Convert the units of measurement below

1) 2.4L	_____ mL	5) 9.7kL	_____ L	9) 4053L	_____ kL
2) 317mL	_____ cL	6) 832L	_____ kL	10) 1312mL	_____ L
3) 352cL	_____ mL	7) 2317L	_____ kL	11) 10.35L	_____ mL
4) 502.4L	_____ kL	8) 7251mL	_____ L	12) 1212mL	_____ kL

## Which has the Largest Capacity?

### Part 1


Which measurement has the largest capacity?


1)	7.7L	777mL	90mL	0.5kL
2)	30.3L	1388mL	2.5kL	2400L
3)	678L	408L	2310L	2.35kL
4)	3100mL	310L	0.53kL	
5)	9600mL	1285mL	9.1L	


### Part 2

Read the problem and choose the correct answer below.

- Brian is deciding which garbage bin to buy. The blue one has a capacity of 30.5L and the black one has a capacity of 3050mL. Which one has a larger capacity?


- Christine is trying to figure out which bottle of floor cleaner is a better deal. The two bottles are the same cost but the green bottle is 4.25L and the blue bottle is 4099mL. Which bottle is a better deal?


- Tom is ordering a drink but he can't decide which one to get. He is very thirsty, so he wants the larger drink. The juice has 759mL of liquid and the pop has 0.71L. Which drink should he order?



**Around the World Math Race: Converting kL, L and mL****Objective** What are we learning about?

Students will practice converting between kiloliters, liters, and milliliters in a competitive and engaging game format.

**Materials** What you will need for the activity

- Conversion questions (e.g., converting kiloliters to liters and milliliters)
- Optional: Timer
- Chairs arranged in a circle

**Instructions** How to complete the activity

1. **Setup:** Arrange chairs in a circle. One student is seated in a chair. One student stands behind a seated student to start the game.
2. **Explain the Game:** Explain to the students they will be competing in a race around the circle by answering conversion questions. The student who answers correctly first moves around the entire circle and return to their original position.
3. **Start the Game:** The teacher reads out a conversion question (e.g., "How many milliliters are in 2.2 liters?").
4. **Answering the Question:** The standing student and the seated student in front of them compete to answer the question first. The student who answers correctly first moves to stand behind the next seated student, while the other student remains seated.
5. **Continue the Race:** The teacher continues reading out questions, and the process repeats. The standing student continues to move around the circle, answering questions at each stop.
6. **Winning the Game:** The first student to make it around the entire circle and return to their original position wins the race.
7. **Review:** After the game, review some of the questions and answers with the class to reinforce the concepts and ensure understanding.

## Questions

Use the questions below for the game

## Questions

How many kiloliters are in 250 liters?

How many liters are in 3.2 kiloliters?

What is the equivalent of 2.4 liters in milliliters?

How many liters are in 7.5 kiloliters?

How many liters are in 1600 milliliters?

How many kiloliters are in 4700 liters?

What is the equivalent of 3.1 liters in milliliters?

How many milliliters are in 0.005 kiloliters?

How many liters are in 0.009 kiloliters?

How many kiloliters are in 5200 liters?

What is the equivalent of 1.2 liters in milliliters?

How many liters are in 0.004 kiloliters?

How many liters are in 900 milliliters?

How many milliliters are in 4.3 liters?

How many kiloliters are in 3800 liters?

What is the equivalent of 5.4 liters in milliliters?

How many liters are in 0.004 kiloliters?

How many milliliters are in 7.6 liters?

How many liters are in 4500 milliliters?

How many kiloliters are in 7380 liters?

How many kiloliters are in 542 liters?

How many liters are in 750 milliliters?

**PREVIEW**

## Estimate the Capacity

### Part 1

Estimate the capacity of each container by circling your answer.

<p>1) A pool</p> <p>a) 50L b) 10kL c) 1000mL d) 5L</p> 	<p>2) A cup</p> <p>a) 300L b) 1kL c) 250mL d) 3L</p> 
<p>3) A bottle</p> <p>a) 1L b) 10L c) 100L d) 500mL</p> 	<p>4) A spoon</p> <p>a) 10kL b) 1L c) 500mL d) 10mL</p> 
<p>5) A wheelbarrow</p> <p>a) 100L b) 5kL c) 10L d) 500mL</p> 	<p>6) A bucket</p> <p>a) 200L b) 1kL c) 10L d) 500mL</p> 
<p>7) A hot tub</p> <p>a) 5L b) 10kL c) 700L d) 500mL</p> 	<p>8) A juice carton</p> <p>a) 10L b) 100L c) 1000L d) 1000mL</p> 
<p>9) A bathtub</p> <p>a) 5L b) 300L c) 5kL d) 500mL</p> 	<p>10) A gas tank</p> <p>a) 50L b) 500mL c) 1kL d) 3kL</p> 

### Part 2

Estimate the capacity of each description below.

Description	Estimate
1) Your classroom garbage can	
2) Your backpack	
3) Your water bottle	
4) Your classroom recycle bin	
5) Your pencil case	

Description	Estimate
6) Your desk/cubby	
7) A shoe box	
8) Your classroom	
9) The sink in your bathroom	
10) The back of a pickup truck	

## 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  
100  
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

- Find your starting unit of measurement
- Count the jumps to get to your ending unit of measurement
- Move the decimal the number of jumps up or down  
Moving Up = Left and Moving Down = Right

#### EXAMPLE

Convert 3000 mg to kg  
3000 mg jumps down = 3 jumps down =  
3000 mg jumps down = 3 jumps down = 3.000 (3 right)  
3.000 kg

#### Practice

Convert the units of measurement below

1) 3.7g \_\_\_\_\_ mg

5) 7.65kg \_\_\_\_\_ g

9) 7129.5g \_\_\_\_\_ kg

2) 316mg \_\_\_\_\_ g

6) 236.5g \_\_\_\_\_ kg

10) 93.22g \_\_\_\_\_ mg

3) 275g \_\_\_\_\_ kg

7) 15.7g \_\_\_\_\_ mg

11) 8.138kg \_\_\_\_\_ g

4) 521.9g \_\_\_\_\_ kg

8) 8432mg \_\_\_\_\_ g

12) 81311mg \_\_\_\_\_ kg

## Measuring Mass - Grams

Milligram (mg)	Gram (g)	Kilogram (kg)
1000 mg = 1g	1000g = 1kg	1kg = 1000g
		

## Part 1

Fill in the tables below

mg	g	g	g	kg	g	kg
1000	1	1.25	1000	1	1550	1.550
1500	1.750			2.5	2550	
2000			3500		3150	
	2.5	4	4000			3.882
	3.0	4.5		5.5		4.312
	3.5	5782	6		5483	
4000		6851			6524	
4500		7157			72	
5000		8.418	9500			8.526
	5.5	9.658	10000			457

## Part 2

Which unit is larger? Use the &lt; &gt; = signs

- |  |  |  |
|--|--|--|
| 1) 1.52g <input type="checkbox"/> 152mg  | 5) 7.15kg <input type="checkbox"/> 41552mg | 9) 5386mg <input type="checkbox"/> 34g       |
| 2) 3.63kg <input type="checkbox"/> 1412g | 6) 23.74g <input type="checkbox"/> 1.7kg   | 10) 7322mg <input type="checkbox"/> 7.299g   |
| 3) 1252mg <input type="checkbox"/> 3.12g | 7) 5.37g <input type="checkbox"/> 5352mg   | 11) 22.22kg <input type="checkbox"/> 24152g  |
| 4) 4.71g <input type="checkbox"/> 5152mg | 8) 1321g <input type="checkbox"/> 1.3kg    | 12) 15.513g <input type="checkbox"/> 16442mg |

## Which Has The Most Mass?

### Part 1

Which measurement has the most mass? Circle it.

1)	130.5g	23 501mg	12 000mg	0.53kg
2)	2352g	2939mg	2.25kg	2140g
3)	5g	0.5g	0.1kg	0.8g
4)	1600mg	1600mg	160g	0.16kg
5)	5750mg	5599mg	5.59g	5.59g

### Part 2

Read the problem and answer the question below.

- 1) Charlotte is deciding which cereals to buy. The yellow box is 1.58kg and the green box is 1580g. Which cereal is the better deal?



- 2) Aria is shopping for bird seed and has two options. The bag of seed has a mass of 4.19kg and the bag of seed is 4203g. Which should she buy?



- 3) Liam wants to tow his boat with his truck. The boat weighs 1805kg and his truck can tow 1 850 000g. Can he tow the boat?



- 4) Lucas wants a lightweight laptop. Option 1 has a mass of 2.31kg and option 2 has a mass of 2 350 000mg. Which is lighter?



## Estimating Mass

### Questions

Circle which mass fits the description

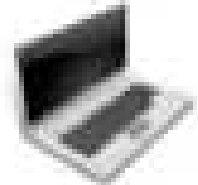
1) A pencil

- a) 500g
- b) 1kg
- c) 5mg
- d) 5g



2) A computer

- a) 200g
- b) 2kg
- c) 50mg
- d) 1000mg



3) A car

- a) 900kg
- b) 100kg
- c) 500mg
- d) 1000mg



4) A cup

- a) 500kg
- b) 5kg
- c) 50g
- d) 500mg



5) A brick

- a) 100g
- b) 2kg
- c) 3000mg
- d) 100kg



6) A roll of toilet paper

- a) 100g
- b) 1kg
- c) 50g
- d) 100mg



7) An apple

- a) 20kg
- b) 1kg
- c) 100g
- d) 200mg



8) A pill of medicine

- a) 400mg
- b) 2kg
- c) 20g
- d) 100g



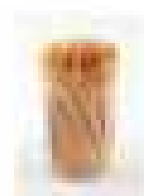
9) Piece of paper

- a) 500g
- b) 5g
- c) 5kg
- d) 5mg



10) A toothpick

- a) 900g
- b) 100mg
- c) 1kg
- d) 3kg
















PREVIEW

## Naming Angles – Right, Obtuse, Acute, Straight, and Reflex

Right Angle - $90^\circ$	Acute Angle - smaller than $90^\circ$	Obtuse Angle - larger than $90^\circ$	Straight Angle - $180^\circ$	Reflex Angle - larger than $180^\circ$
				

**Instruction:** Label the angle – straight, acute, obtuse, right, or reflex

1) 	3) 	4) 	
5) 	6) 	8) 	
9) 	10) 	11) 	
13) 	14) 	15) 	16) 

## Measuring Angles - Printed Protractor

### Instructions

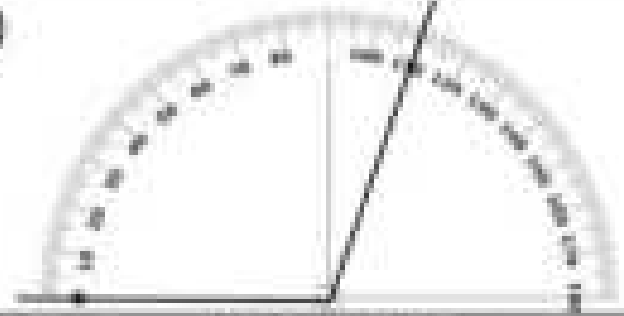
Measure the angles and label them acute, right or obtuse

1)



Angle = \_\_\_\_\_ Type of Angle = \_\_\_\_\_

2)



Angle = \_\_\_\_\_ Type of Angle = \_\_\_\_\_

3)



Angle = \_\_\_\_\_ Type of Angle = \_\_\_\_\_

4)



Angle = \_\_\_\_\_ Type of Angle = \_\_\_\_\_

5)



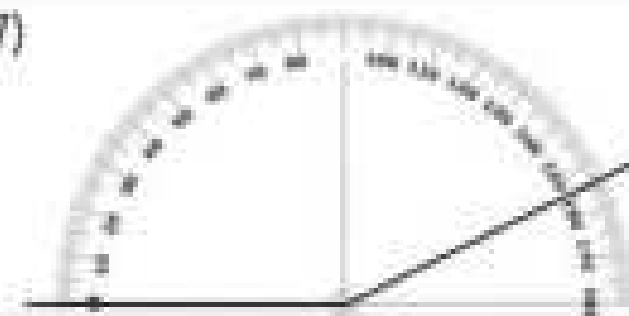
Angle = \_\_\_\_\_ Type of Angle = \_\_\_\_\_

6)



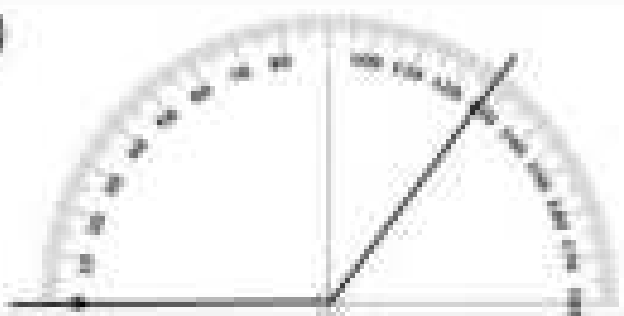
Angle = \_\_\_\_\_ Type of Angle = \_\_\_\_\_

7)



Angle = \_\_\_\_\_ Type of Angle = \_\_\_\_\_

8)



Angle = \_\_\_\_\_ Type of Angle = \_\_\_\_\_

**PREVIEW**

**Measuring Angles Up To  $180^\circ$** **Instructions**

Measure the angles and label them acute, right or obtuse

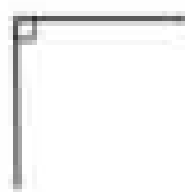
1)



2)



3)



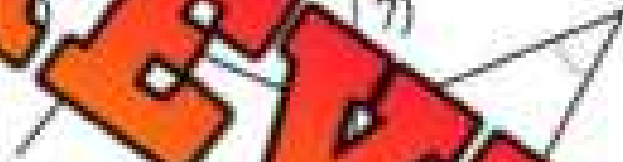
4)



5)



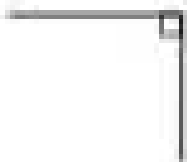
7)



8)



9)



10)



11)



13)



14)



15)



16)

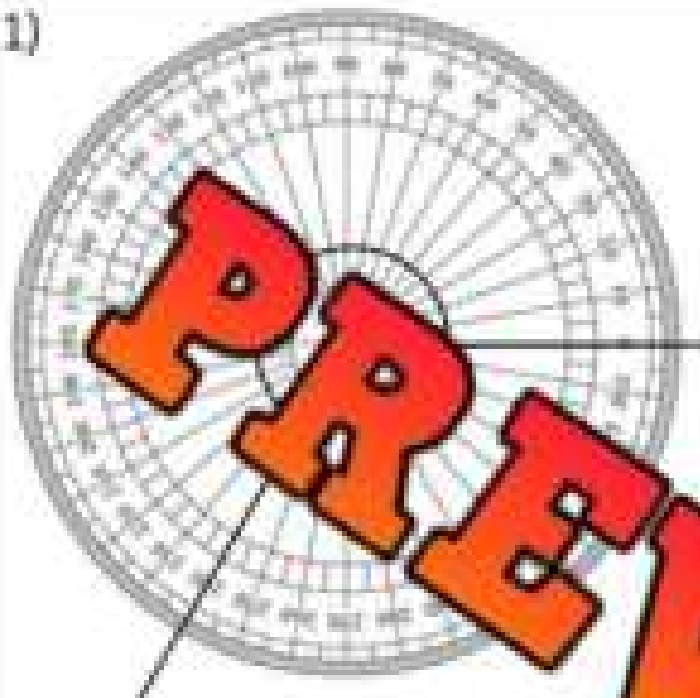
**PREVIEW**

# Using Printed Protractor – Angles Up To 360°

## Instructions

Measure the angles below using the circular protractor

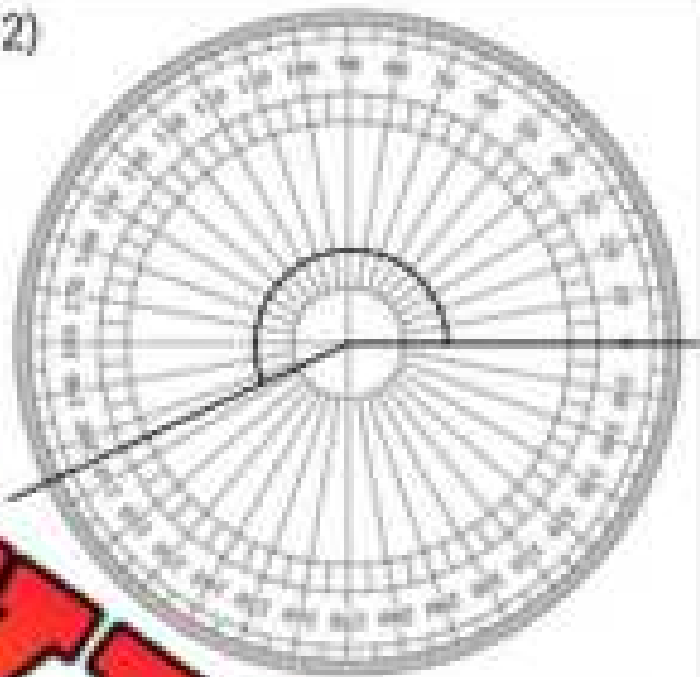
1)



Angle =

Type of Angle =

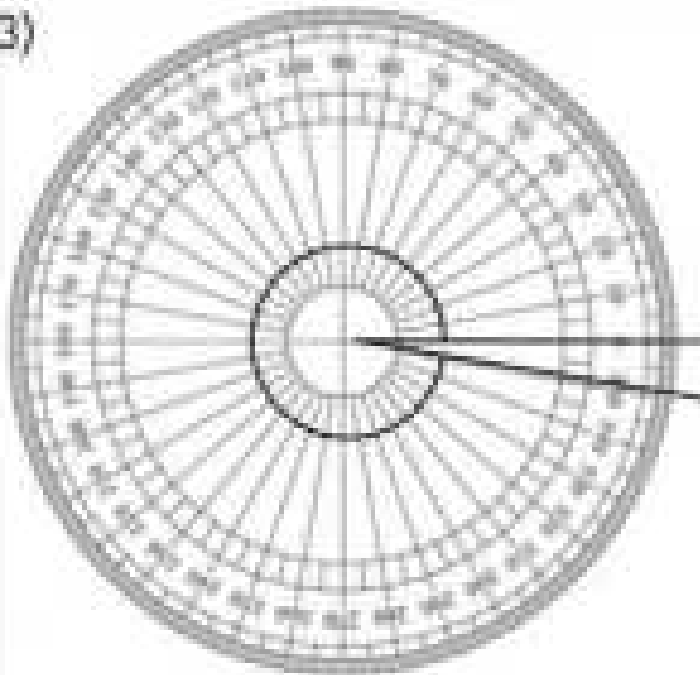
2)



Angle =

Type of Angle =

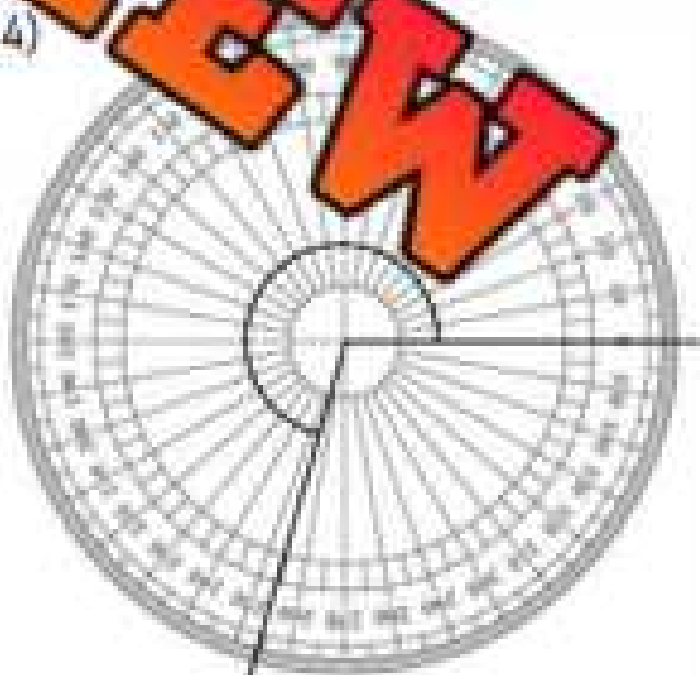
3)



Angle =

Type of Angle =

4)



Angle =

Type of Angle =

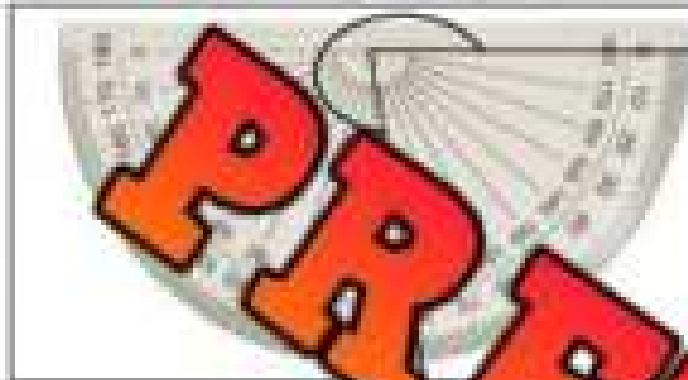
**PREVIEW**

## Measuring Angles Up To $360^\circ$

We can measure reflex angles that are larger than  $180^\circ$  by using a circular protractor or a semi-circular protractor.

When using a semi-circular protractor, you can use one of two strategies:

- 1) Measure the angle starting with  $180^\circ$  and add  $180^\circ$
- 2) Measure the remaining angle from  $0^\circ$  and subtract  $360^\circ$



**Solution**

Strategy 1

$$180 + 100 = 280$$

Strategy 2

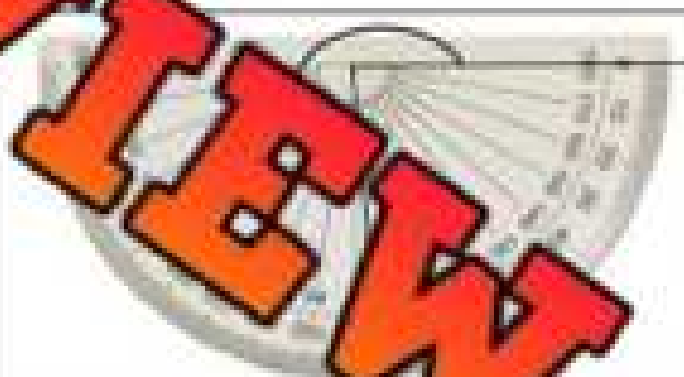
$$360 - 80 = 280$$

Instructions

Measure



1) Angle Size =



2) Angle Size =



3) Angle Size =

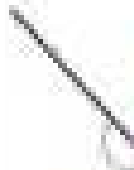


4) Angle Size =

**Measuring Angles Up To  $360^\circ$** **Instructions**

Measure the angles below

1)



2)



3)



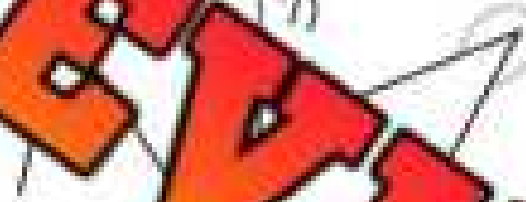
4)



5)



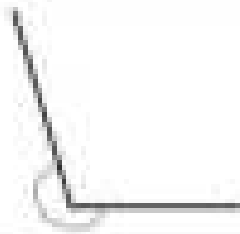
7)



8)



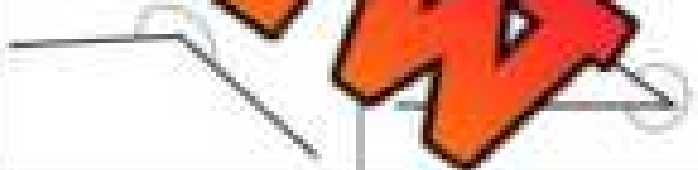
9)



10)



11)



13)



14)



15)



16)

**PREVIEW**



## Constructing Angles - Estimating – Multiple Choice

**Instructions**

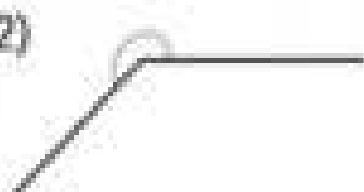
Circle which angle you think it is. Do not use a protractor

1)



- a)  $\angle = 45^\circ$   
 b)  $\angle = 135^\circ$   
 c)  $\angle = 90^\circ$   
 d)  $\angle = 180^\circ$

2)



- a)  $\angle = 95^\circ$   
 b)  $\angle = 100^\circ$   
 c)  $\angle = 225^\circ$   
 d)  $\angle = 290^\circ$

3)



- a)  $\angle = 171^\circ$   
 b)  $\angle = 9^\circ$   
 c)  $\angle = 50^\circ$   
 d)  $\angle = 85^\circ$

4)



- a)  $\angle = 168^\circ$   
 b)  $\angle = 50^\circ$   
 c)  $\angle = 120^\circ$   
 d)  $\angle = 10^\circ$

5)



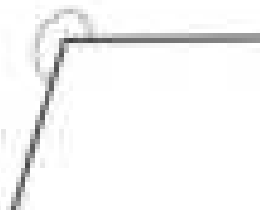
- a)  $\angle = 60^\circ$   
 b)  $\angle = 120^\circ$   
 c)  $\angle = 10^\circ$   
 d)  $\angle = 180^\circ$

7)



- a)  $\angle = 50^\circ$   
 b)  $\angle = 160^\circ$   
 c)  $\angle = 20^\circ$   
 d)  $\angle = 100^\circ$

8)



- a)  $\angle = 75^\circ$   
 b)  $\angle = 190^\circ$   
 c)  $\angle = 255^\circ$   
 d)  $\angle = 355^\circ$

9)



- a)  $\angle = 40^\circ$   
 b)  $\angle = 30^\circ$   
 c)  $\angle = 140^\circ$   
 d)  $\angle = 170^\circ$

## Constructing Angles Up To 180°

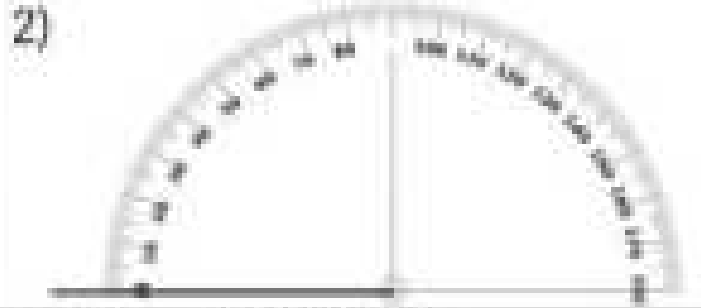
**Instructions**

Construct the angles and label them acute, right or obtuse.

1)


 $\angle = 7^\circ$ 

2)


 $\angle = 130^\circ$  Type of Angle = \_\_\_\_\_

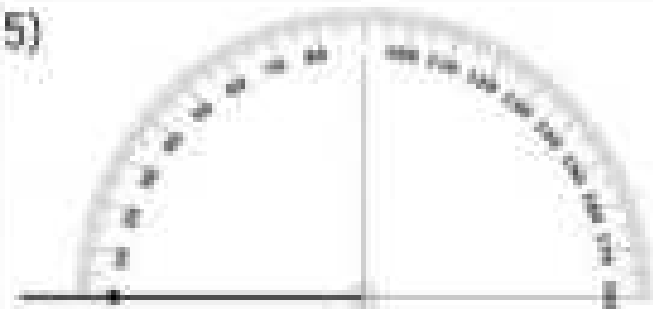
3)


 $\angle = 126^\circ$  Type of Angle = \_\_\_\_\_

4)


 $\angle = 101^\circ$  Type of Angle = \_\_\_\_\_

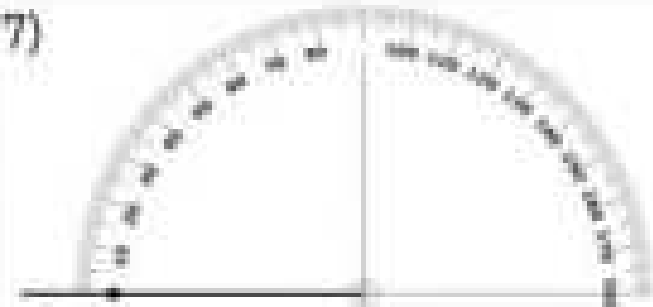
5)


 $\angle = 178^\circ$  Type of Angle = \_\_\_\_\_

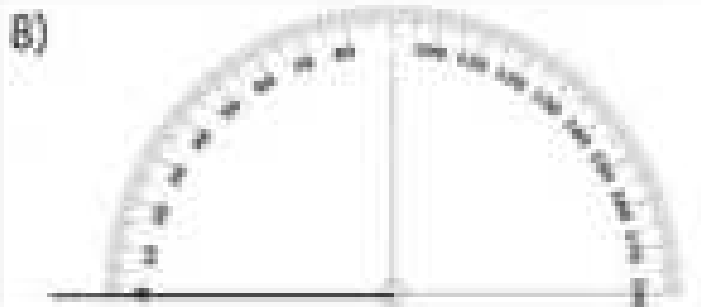
6)


 $\angle = 156^\circ$  Type of Angle = \_\_\_\_\_

7)


 $\angle = 71^\circ$  Type of Angle = \_\_\_\_\_

8)


 $\angle = 130^\circ$  Type of Angle = \_\_\_\_\_

PREVIEW

# Exit Cards

Cut Out

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

Name: \_\_\_\_\_

Construct the angle and label it.



Angle =  $\angle = 175^\circ$

Type of Angle = \_\_\_\_\_

Name: \_\_\_\_\_

Construct the angle and label it.

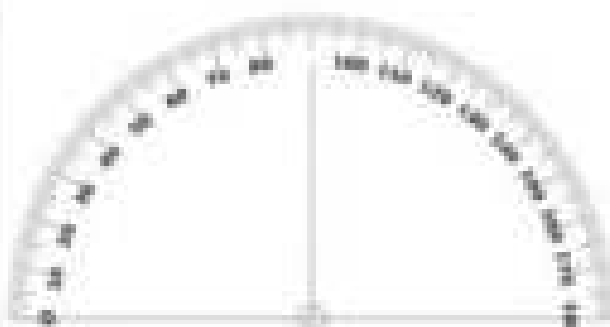


Angle =  $\angle = 175^\circ$

Type of Angle = \_\_\_\_\_

Name: \_\_\_\_\_

Construct the angle and label it.



Angle =  $\angle = 175^\circ$

Type of Angle = \_\_\_\_\_

Name: \_\_\_\_\_

Construct the angle and label it.



Angle =  $\angle = 175^\circ$

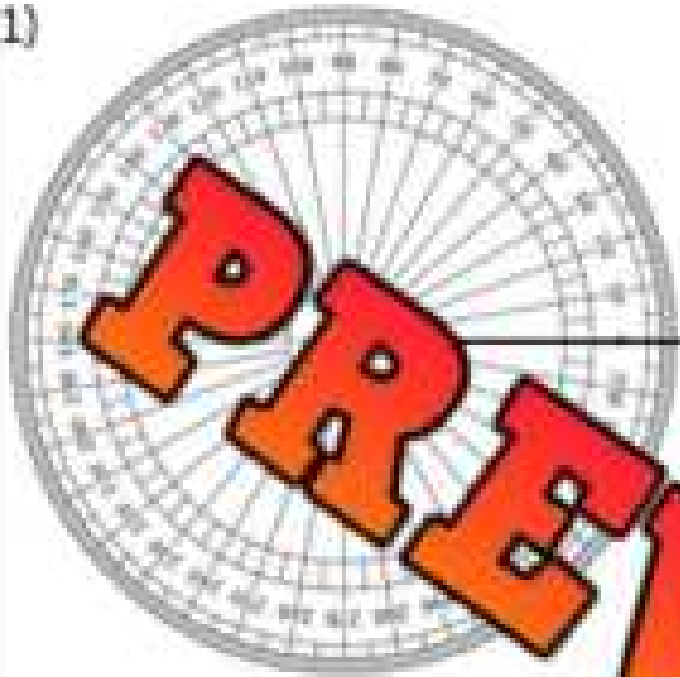
Type of Angle = \_\_\_\_\_

## Constructing Angles Up To $360^\circ$

Instructions:

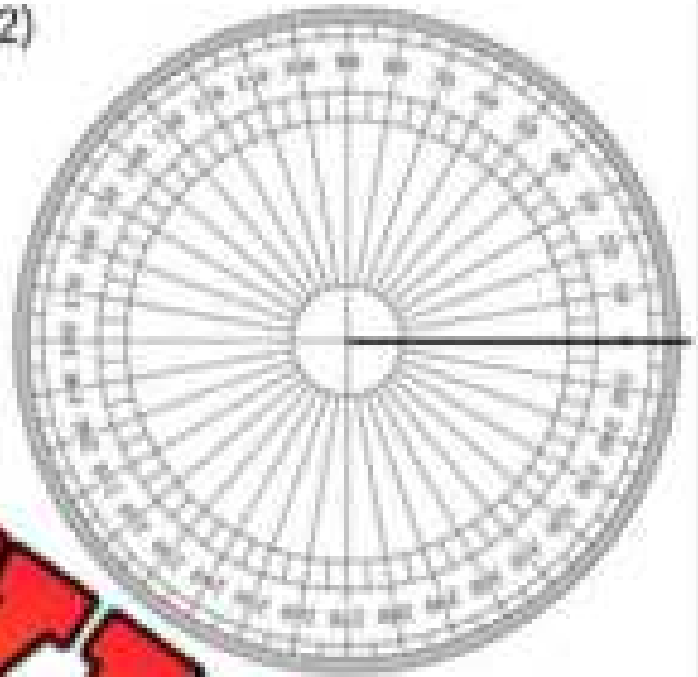
Construct the angles below

1)



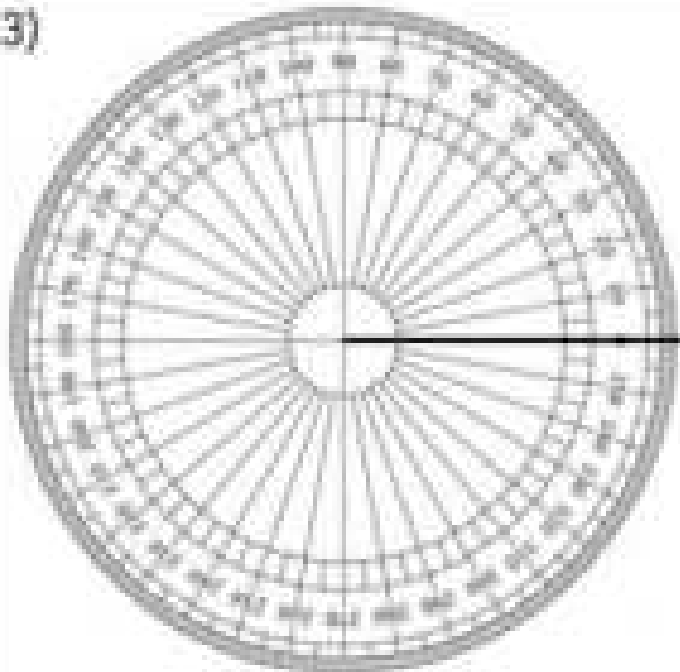
Angle =  $195^\circ$

2)



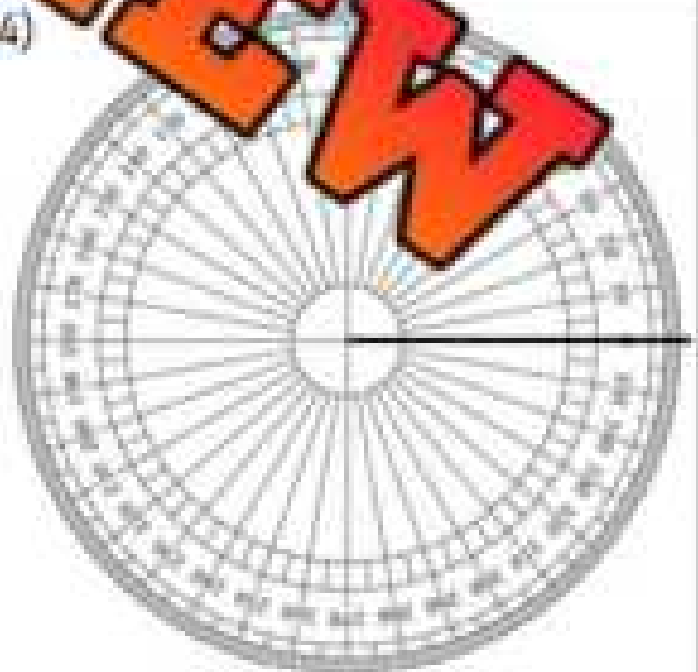
Angle =  $292^\circ$

3)



Angle =  $347^\circ$

4)



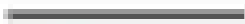
Angle =  $262^\circ$

**PREVIEW**

**Constructing Angles Up To  $360^\circ$** **Part 1**

Use a protractor to draw the angles below using the line provided

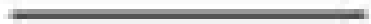
1)

 $\angle = 22^\circ$ 

2)

 $\angle = 275^\circ$ 

3)

 $\angle = 350^\circ$ **Part 2**

Use a protractor to draw the angles below

1)

 $\angle = 287^\circ$ 

2)

 $\angle = 322^\circ$ 

3)

4)

 $\angle = 248^\circ$ 

5)

 $\angle = 318^\circ$ 

6)

 $\angle = 264^\circ$

## Complementary Angles

**Complementary Angles** are two angles that add up to  $90^\circ$ . Therefore, the angles  $40^\circ$  and  $50^\circ$  are complementary angles because they add up to  $90^\circ$ . Together, complementary angles add up to make a right angle.

**Example:**

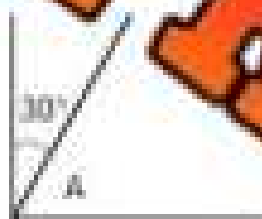


We can determine the missing complementary angle by subtracting the known angle from 90.



**Practice** the complementary angles.

1)



$$\angle A = \underline{\quad}^\circ$$

3)



$$\angle C = \underline{\quad}^\circ$$

4)



$$\angle A = \underline{\quad}^\circ$$

5)



$$\angle B = \underline{\quad}^\circ$$

$$\angle C = \underline{\quad}^\circ$$

7)



$$\angle A = \underline{\quad}^\circ$$

8)



$$\angle B = \underline{\quad}^\circ$$

9)



$$\angle C = \underline{\quad}^\circ$$

## Supplementary Angles

**Supplementary Angles** are two angles that add up to  $180^\circ$ . You will notice that two supplementary angles make a straight angle of  $180^\circ$ .

**Example:**



We can determine the missing supplementary angle by subtracting the known angle from 180.



**Prac:** Find the supplementary angles.



$$\angle A = \underline{\hspace{2cm}}^\circ$$



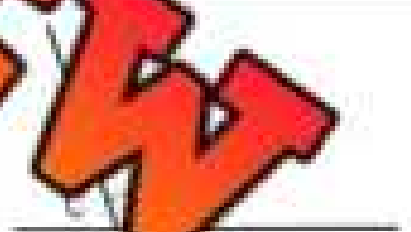
$$\angle C = \underline{\hspace{2cm}}^\circ$$



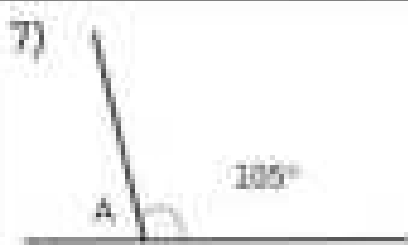
$$\angle A = \underline{\hspace{2cm}}^\circ$$



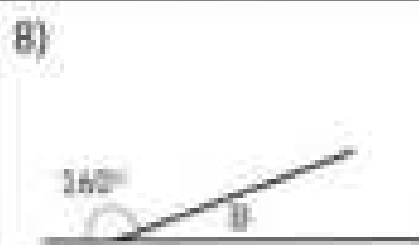
$$\angle B = \underline{\hspace{2cm}}^\circ$$



$$\angle C = \underline{\hspace{2cm}}^\circ$$



$$\angle A = \underline{\hspace{2cm}}^\circ$$



$$\angle B = \underline{\hspace{2cm}}^\circ$$



$$\angle C = \underline{\hspace{2cm}}^\circ$$

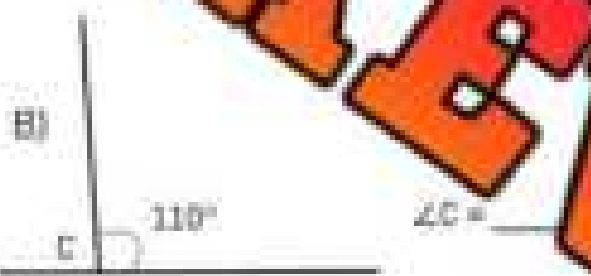
# Exit Cards

Cut Out

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

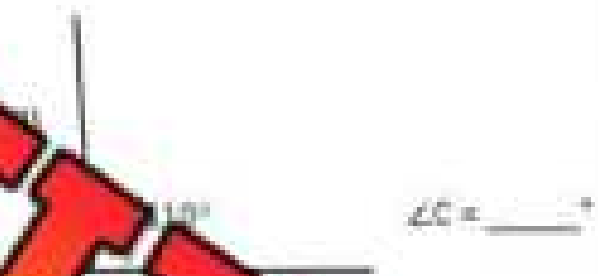
Name: \_\_\_\_\_

Determine the supplementary angles



Name: \_\_\_\_\_

Determine the supplementary angles



Name: \_\_\_\_\_

Determine the supplementary angles



Name: \_\_\_\_\_

Determine the supplementary angles



**PREVIEW**

## Complementary and Supplementary Angles

**Part 1** Analyze the angles below. Are they complementary, supplementary or neither?

1)



Original Angle

--	--	--

Original Angle

--	--	--

3)



Original Angle

--	--	--

**Part 2** Fill in the table by writing in the complementary and supplementary angles.

Angle	Supplementary	Complementary
42		
58		

Angle	Supplementary	Complementary
77		
23		

## Complementary and Supplementary Angles

**Part 1**

Write the complementary angle for each angle below

#	Angle	Complementary
1	$42^\circ$	
2	$67^\circ$	
3		
4		

#	Angle	Complementary
5	$41^\circ$	
6	$54^\circ$	
7	$77^\circ$	
8	$18^\circ$	

**Part 2**

Are the given pairs of angles complementary? Yes or No?

#	Pair	Yes/No
1	$51^\circ, 39^\circ$	
2	$72^\circ, 8^\circ$	
3	$130^\circ, 50^\circ$	

#	Pair	Yes/No
4	$44^\circ, 44^\circ$	
5	$68^\circ, 22^\circ$	
6	$47^\circ$	

**Part 3**

Write the supplementary angle for each angle below

#	Angle	Supplementary
1	$132^\circ$	
2	$127^\circ$	
3	$156^\circ$	
4	$123^\circ$	

#	Angle	Supplementary
5	$14^\circ$	
6	$165^\circ$	
7	$173^\circ$	
8	$115^\circ$	

**Part 4**

Are the given pairs of angles supplementary? Yes or No?

#	Pair	Yes/No
1	$145^\circ, 45^\circ$	
2	$56^\circ, 34^\circ$	
3	$125^\circ, 55^\circ$	

#	Pair	Yes/No
4	$166^\circ, 14^\circ$	
5	$48^\circ, 122^\circ$	
6	$116^\circ, 64^\circ$	

## Introduction – Opposite Angles

**Opposite angles** are a pair of angles that are directly opposite to each other and are formed by two intersecting lines.



Angles A and B are opposite angles that are congruent, meaning they have the same angle measurement.

Angles C and D are also opposite angles which means they have the same angle measurements.

**Part 1:** Which angles are opposite in the two intersecting lines below?



\_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_ and \_\_\_\_\_

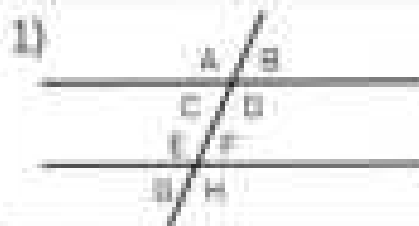


\_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_ and \_\_\_\_\_



\_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_ and \_\_\_\_\_

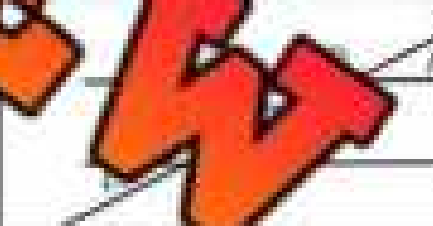
**Part 2:** Which angles are opposite in the two intersecting lines below?



\_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_ and \_\_\_\_\_



\_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_ and \_\_\_\_\_



\_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_ and \_\_\_\_\_



\_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_ and \_\_\_\_\_



\_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_ and \_\_\_\_\_



\_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_ and \_\_\_\_\_

## Determining Angles Using Opposite and Supplementary Angles

**Opposite angles** are a pair of angles that are directly opposite to each other and are formed by two intersecting lines.



If we know the value of angle  $A$ , we know that the opposite angle,  $D$  is the same.

We can also use our knowledge of supplementary angles to determine other missing angles. We have learned that angles  $A$  and  $B$  are supplementary, meaning they need to equal up to 180. Angles  $C$  and  $D$ ,  $A$  and  $C$ , and  $B$  and  $D$  are all supplemental as well.

Therefore, we can calculate  $B$  by subtracting 180 from  $A$ .  
 $B = 180 - 110 = 70$ . Since  $C$  is an opposite angle, it is also  $70^\circ$ .

### Questions

Find the value of the unknown angle measurements.



A =

C =

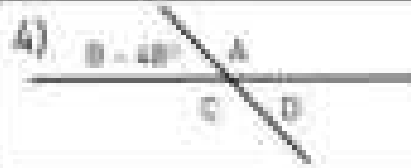
D =



A =

C =

D =



A =

C =

D =



A =

C =

D =



A =

C =

D =



A =

C =

D =



A =

C =

D =

## Determining Angles Using Opposite and Supplementary Angles

### Questions

Find the values of the unknown angle measurements.

1)



A = 129

B = 129

C = 51

2)



A =

B =

C =

3)

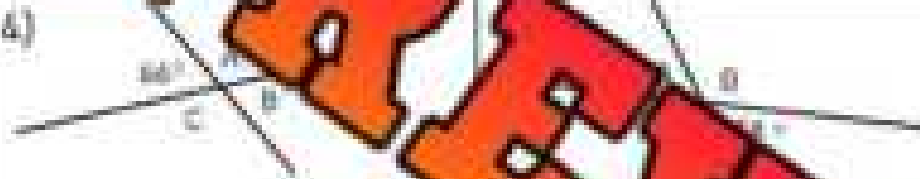


A =

B =

C =

4)



A =

B =

C =

5)



A =

B =

C =

7)



A =

B =

C =

8)



A =

B =

C =

9)

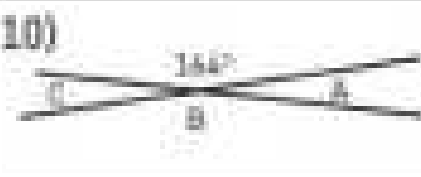


A =

B =

C =

10)

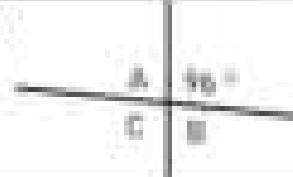


A =

B =

C =

11)



A =

B =

C =

12)



A =

B =



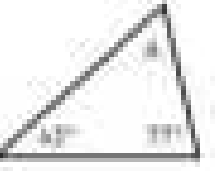

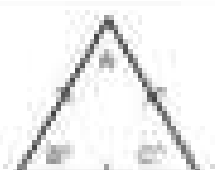




C =

## Interior Angles - Triangles

**Interior angles** are the angles inside a shape. The interior angles of a triangle will always equal  $180^\circ$ . We can use this information to solve for unknown angle measurements.

 <p>All angles are the same. Therefore, all angles = <math>60^\circ</math></p> <p><math>60 + 60 + 60 = 180</math></p> <p><b>Equilateral Triangle</b></p>	 <p>Two angles are the same. Therefore, angle A = <math>50^\circ</math></p> <p><math>65 + 65 + A = 180</math> <math>A = 50^\circ</math></p> <p><b>Isosceles Triangle</b></p>	 <p>All angles are different. Therefore, angle A = <math>75^\circ</math></p> <p><math>30 + 75 + A = 180</math> <math>A = 75^\circ</math></p> <p><b>Scalene Triangle</b></p>
---	---	--

**Instructions:** Find the values of the unknown angle measurements

<p>1)</p>  <p>A = _____</p>	<p>3)</p>  <p>A = _____</p>	
<p>4)</p>  <p>A = _____</p>	<p>5)</p>  <p>A = _____</p>	
<p>7)</p>  <p>A = _____</p>	<p>8)</p>  <p>A = _____</p>	
<p>10)</p>  <p>A = _____</p>	<p>11)</p>  <p>A = _____</p>	<p>12)</p>  <p>A = _____</p>

# Exit Cards

Cut Out

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

Name: \_\_\_\_\_

1) Find the missing angle in the triangles below



2) Maria cuts a cake into 10 equal slices. Each isosceles triangle slice has two angles of  $35^\circ$ . What is the third angle?

\_\_\_\_\_

Name: \_\_\_\_\_

1) Find the missing angle in the triangles below



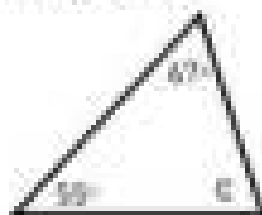
C = \_\_\_\_\_

2) Maria cuts a cake into 10 equal slices. Each isosceles triangle slice has two angles of  $35^\circ$ . What is the third angle?

\_\_\_\_\_

Name: \_\_\_\_\_

1) Find the missing angle in the triangles below



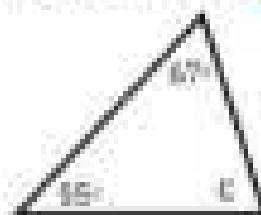
C = \_\_\_\_\_

2) Maria cuts a cake into 10 equal slices. Each isosceles triangle slice has two angles of  $35^\circ$ . What is the third angle?

\_\_\_\_\_

Name: \_\_\_\_\_

1) Find the missing angle in the triangles below



C = \_\_\_\_\_

2) Maria cuts a cake into 10 equal slices. Each isosceles triangle slice has two angles of  $35^\circ$ . What is the third angle?

\_\_\_\_\_

## Interior Angles - Quadrilaterals

**Interior angles** are the angles inside a shape. The interior angles of a quadrilateral will always equal  $360^\circ$ . We can use this information to solve for unknown angle measurements.



A rectangle has 4 equal angles that are  $90^\circ$ .

$$\begin{aligned} \angle A + \angle B + \angle C + \angle D &= 360 \\ 90 + 90 + 90 + 90 &= 360 \end{aligned}$$



The trapezoid has 2 pairs of equal angles.

$$\begin{aligned} 75 + 75 + 105 + B &= 360 \\ B &= 105 \end{aligned}$$

**Instructions:** Find the values of the unknown angle measurements.

1)



A =



A =

3)



A =

4)



A =

5)



A =

7)



A =

8)



A =

9)



A =

10)



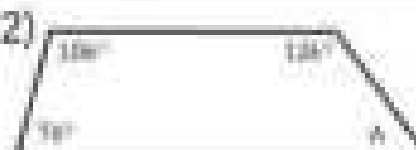
A =

11)



A =

12)



A =

## Escape Room Math: Angle Adventures

### Objective

What are we learning about?

Students will practice measuring and calculating the interior angles of quadrilaterals and triangles through a fun and interactive escape room game, enhancing their geometric skills and problem-solving abilities.

### Materials

What you will need for the activity

- Index cards
- Envelopes (one for each problem)
- Small locks (or combination locks)
- Boxes or small containers (for keys)
- Markers or pens
- Timer (optional)



### Instructions

How you will complete the activity

1. Prepare a series of math problems involving measuring and calculating the interior angles of quadrilaterals and triangles. Write each problem on a separate index card and place each card in an envelope.
2. Set up the classroom as an "escape room" with different stations. Each station will have a box or container with a lock, containing the next problem.
3. Divide the students into small groups. Explain that they must solve the angle problems to find the keys or combinations to escape the room.
4. Give each group the first envelope with the initial problem. Once they solve the problem and measure or calculate the angles correctly, they will receive a key or combination to unlock the next box (they can come to you for verification or have a student helper).
5. Each group will move from station to station, solving problems and collecting keys or combinations. Use small locks and keys or combination locks to add a layer of challenge.
6. The first group to solve all the problems and "escape" from the room wins the game.

## Math Cards

Cut out the math cards below

A quadrilateral has interior angles of  $90^\circ$ ,  $85^\circ$ , and  $95^\circ$ . Calculate the fourth angle.



$$A = \underline{\hspace{2cm}}$$



$$\angle A = \underline{\hspace{2cm}}$$

$$\angle B = \underline{\hspace{2cm}}$$

$$\angle C = \underline{\hspace{2cm}}$$



Measure the angles of a triangle with one angle of  $80^\circ$  and another angle of  $70^\circ$ .

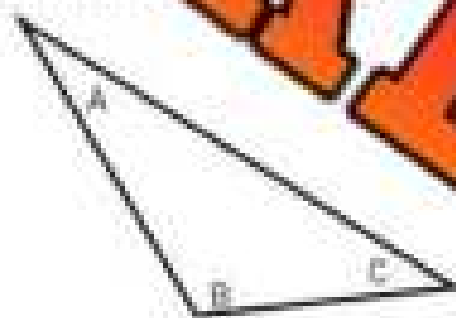


$$x = \underline{\hspace{2cm}}$$

## Math Cards

Cut out the math cards below

A carpenter is constructing a triangular frame. Two of the angles in the triangle measure  $45^\circ$  and  $90^\circ$ . What is the measurement of the third angle?



$\angle A = \underline{\hspace{2cm}}$

$\angle B = \underline{\hspace{2cm}}$

$\angle C = \underline{\hspace{2cm}}$

An architect is designing a triangular window with two equal angles measuring  $50^\circ$ . What is the measurement of the third angle in the window?

In a kite, two of the angles measure  $65^\circ$  and  $115^\circ$ . What are the measurements of the other two angles if they are equal?



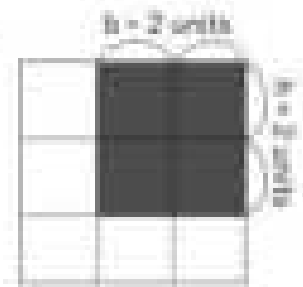
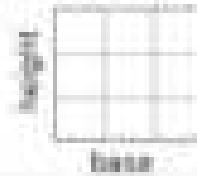
$Z = \underline{\hspace{2cm}}$

In a trapezoid, two of the angles measure  $70^\circ$  and  $110^\circ$ . If the other two angles are equal, what are their measurements?

## Area – Units Squared

When we calculate the area of a shape, we can use the following formula

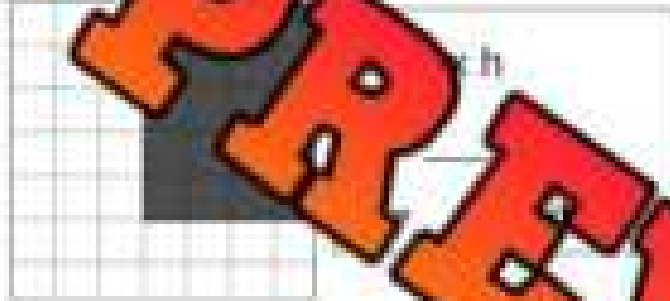
$$A = \text{base (b)} \times \text{height (h)}$$



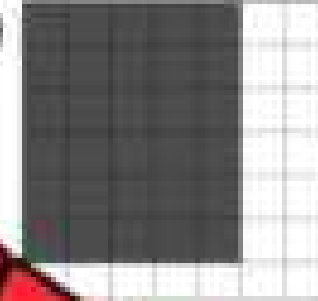
$$\begin{aligned} A &= b \times h \\ A &= 2 \times 2 \\ A &= 4 \text{ units}^2 \end{aligned}$$

**Instruction:** Find the area of the shapes below.

1)

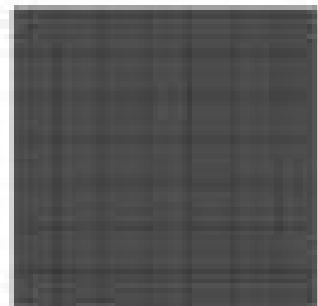


2)

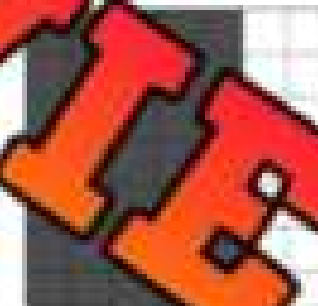


$$\begin{aligned} A &= b \times h \\ A &= \_ \times \_ \\ A &= \_ \text{ units}^2 \end{aligned}$$

3)

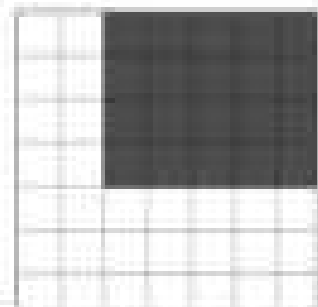


$$\begin{aligned} A &= b \times h \\ A &= \_ \times \_ \\ A &= \_ \text{ units}^2 \end{aligned}$$



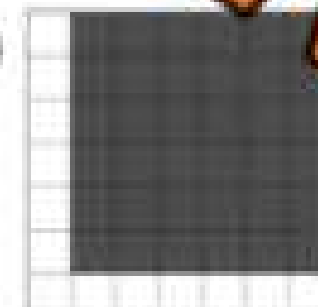
$$\begin{aligned} A &= b \times h \\ A &= \_ \times \_ \\ A &= \_ \text{ units}^2 \end{aligned}$$

5)



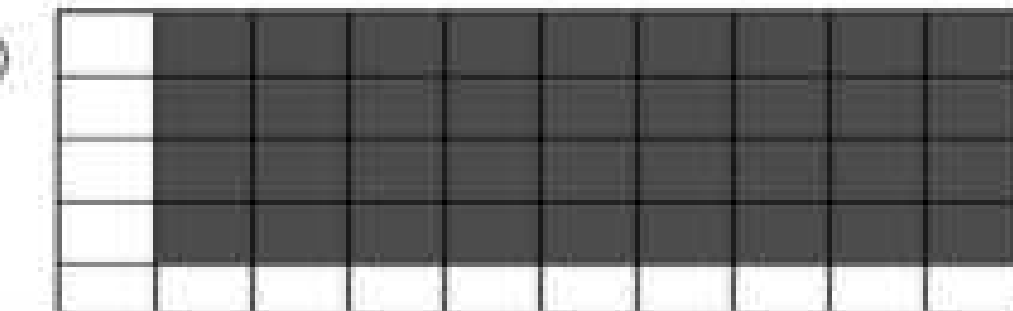
$$\begin{aligned} A &= b \times h \\ A &= \_ \times \_ \\ A &= \_ \text{ units}^2 \end{aligned}$$

6)



$$\begin{aligned} A &= b \times h \\ A &= \_ \times \_ \\ A &= \_ \text{ units}^2 \end{aligned}$$

7)



$$\begin{aligned} A &= b \times h \\ A &= \_ \times \_ \\ A &= \_ \text{ units}^2 \end{aligned}$$

**Finding the Missing Information****Instructions**Find the missing value ( $A = b \times h$ )

1)



Base = \_\_\_\_\_

Height = \_\_\_\_\_

Area = \_\_\_\_\_

2)

3cm



Base = \_\_\_\_\_

Height = \_\_\_\_\_

Area = \_\_\_\_\_

3)



Base = \_\_\_\_\_

Height = \_\_\_\_\_

Area = \_\_\_\_\_

4)

11m



Base = \_\_\_\_\_

Height = \_\_\_\_\_

Area = \_\_\_\_\_

5)

4m



Base = \_\_\_\_\_

Height = \_\_\_\_\_

Area = \_\_\_\_\_

6)

7m



Base = \_\_\_\_\_

Height = \_\_\_\_\_

Area = \_\_\_\_\_

7)

 $A = 64\text{cm}^2$ 

Base = \_\_\_\_\_

Height = \_\_\_\_\_

Area = \_\_\_\_\_

8)

1m



Base = \_\_\_\_\_

Height = \_\_\_\_\_

Area = \_\_\_\_\_

9)

 $A = 77\text{cm}^2$ 

Base = \_\_\_\_\_

Height = \_\_\_\_\_

Area = \_\_\_\_\_

10)

7cm



Base = \_\_\_\_\_

Height = \_\_\_\_\_

Area = \_\_\_\_\_

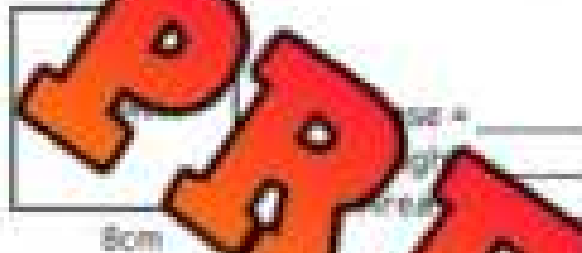
# Exit Cards

Cut Out

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

Name: \_\_\_\_\_

1) Find the missing value ( $A = b \times h$ )

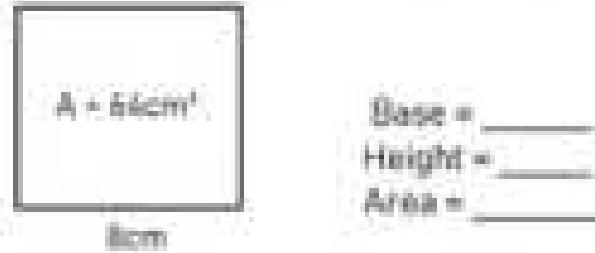


2) A rectangular billboard has an area of  $150 \text{ cm}^2$ . The height of the billboard is 15 cm. What is the base?

\_\_\_\_\_

Name: \_\_\_\_\_

1) Find the missing value ( $A = b \times h$ )



2) A rectangular billboard has an area of  $150 \text{ cm}^2$ . The height of the billboard is 15 cm. What is the base?

\_\_\_\_\_

Name: \_\_\_\_\_

1) Find the missing value ( $A = b \times h$ )



2) A rectangular billboard has an area of  $150 \text{ cm}^2$ . The height of the billboard is 15 cm. What is the base?

\_\_\_\_\_

Name: \_\_\_\_\_

1) Find the missing value



2) A rectangular billboard has an area of  $150 \text{ cm}^2$ . The height of the billboard is 15 cm. What is the base?

\_\_\_\_\_

PREVIEW

## Task Cards: Area Calculation Expedition

### Objective

What are we learning about?

Students will develop their skills in determining the area of different shapes, enhancing their understanding of geometry through an interactive and engaging activity.

### Materials

What you will need for the activity

- 24 Task Cards
- Answer Recording Sheet for answers
- Pen or Pencil



### Instructions

How to run the activity

1. Start by explaining the concept of area for both regular and irregular polygons. Highlight how this knowledge applies to various real-life contexts.
2. Pair up the students and provide each pair with a set of task cards.
3. Hand out an answer recording sheet to each pair for their solutions.
4. Foster teamwork by encouraging students to work together to solve the area problems.
5. Allow students to choose any task card to start with, and let them complete the cards in any order they prefer.
6. Instruct students to record the letter of their chosen answer (A, B, or C) on their answer sheet next to the task card's number.
7. Use a timer to create a dynamic and competitive environment, adjusting the duration to fit the lesson's objectives and complexity.
8. After the activity, review the answers as a class, discussing any challenging problems and the strategies used to solve them.
9. Encourage students to reflect on the activity by sharing the methods they used and any obstacles they encountered.

## Task Cards

Cut out the task cards below

## Card 9:

A rectangular field has an area of  $250\text{m}^2$ .  
If the width is  $25\text{m}$ , what is the length?

## Card 13:

A rectangular garden has a length of  $16\text{m}$  and a width of  $10\text{m}$ . What is the area of the garden?

## Card 14:

A square playground has an area of  $121\text{m}^2$ . What is the length of one side of the playground?

A rectangular classroom has an area of  $1000\text{cm}^2$ . If the width is  $15\text{m}$ , what is the length in  $\text{m}$ ?

## Card 11:

A rectangle has a length of  $10\text{m}$  and a width of  $6\text{m}$ . What is the area of the rectangle?

A rectangular sheet of paper has an area of  $80\text{cm}^2$ . If the width is  $10\text{cm}$ , what is the length in  $\text{m}$ ?

## Card 12:

A square tile has a side length of  $10\text{cm}$ . What is the area of the tile?

## Card 16:

A rectangular piece of wood has an area of  $36\text{cm}^2$ . If the height is  $6\text{cm}$ , what is the base?

Task Cards

Cut out the task cards below

Card 17:



90mm

Area = \_\_\_\_\_

Card 21:



$A=45\text{cm}^2$

5cm

Base = \_\_\_\_\_

Height = \_\_\_\_\_

Area = \_\_\_\_\_

Card 22:

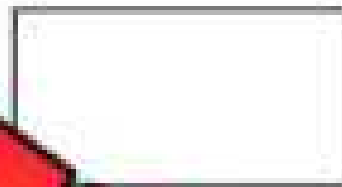


$A=54\text{cm}^2$

6cm

Height = \_\_\_\_\_

Area = \_\_\_\_\_



900cm

7m

Area = \_\_\_\_\_

Card 19:



3900m

8km

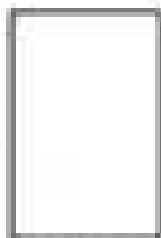
Area = \_\_\_\_\_

7m



$A=63\text{m}^2$

Card 20:



11.5m

5.3cm

Area = \_\_\_\_\_

Card 24:



3m

5400cm<sup>2</sup>

Area = \_\_\_\_\_

**PREVIEW**

**Task Cards: Area Calculation****Answers**

Record your answers below

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

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

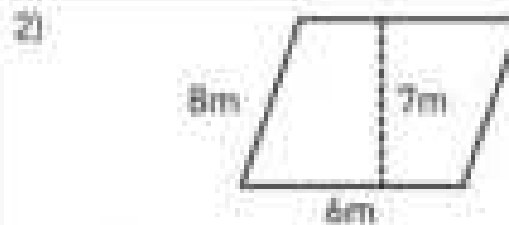
**PREVIEW**

## Perimeter and Area of Parallelograms

**Instructions**

 Find the perimeter and area of the parallelograms below ( $A = b \times h$ )

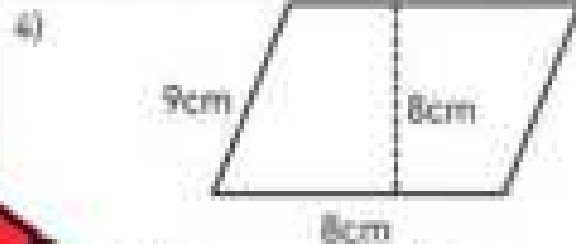

Perimeter = \_\_\_\_\_ Area = \_\_\_\_\_



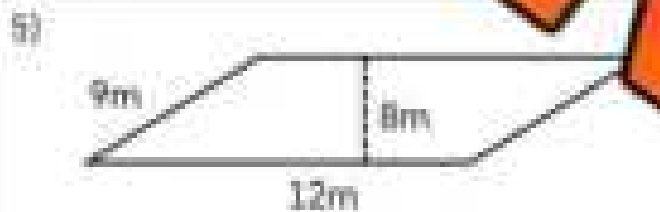
Perimeter = \_\_\_\_\_ Area = \_\_\_\_\_



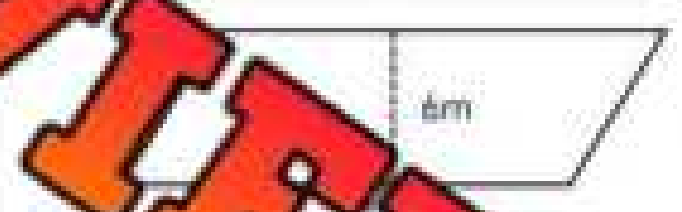
Perimeter = \_\_\_\_\_ Area = \_\_\_\_\_



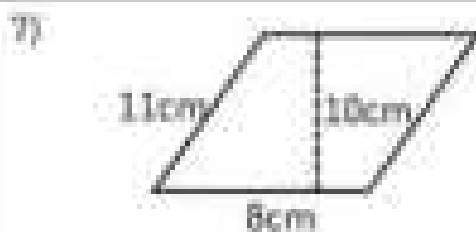
Perimeter = \_\_\_\_\_ Area = \_\_\_\_\_



Perimeter = \_\_\_\_\_ Area = \_\_\_\_\_



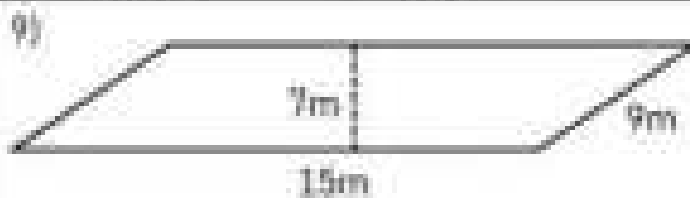
Perimeter = \_\_\_\_\_ Area = \_\_\_\_\_



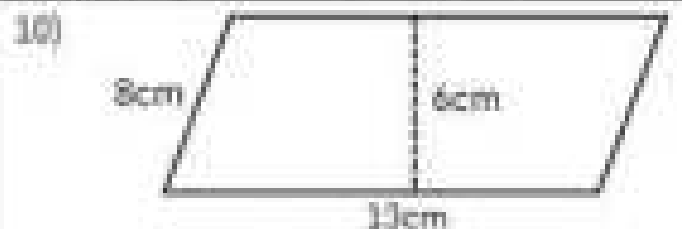
Perimeter = \_\_\_\_\_ Area = \_\_\_\_\_



Perimeter = \_\_\_\_\_ Area = \_\_\_\_\_



Perimeter = \_\_\_\_\_ Area = \_\_\_\_\_



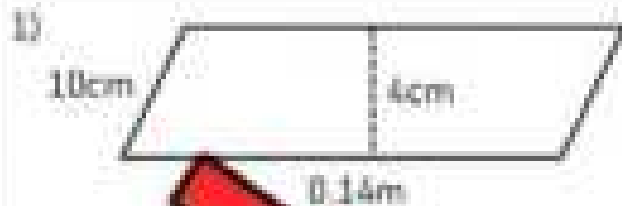
Perimeter = \_\_\_\_\_ Area = \_\_\_\_\_

PREVIEW

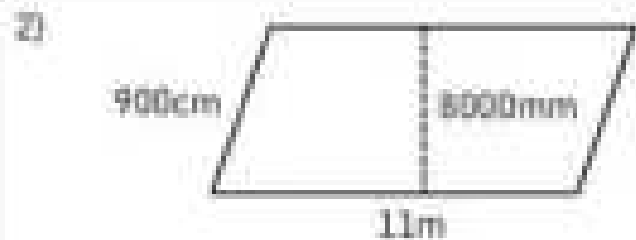
## Perimeter and Area of Parallelograms

### Part 1

Find the perimeter and area of the parallelograms below ( $A = b \times h$ )



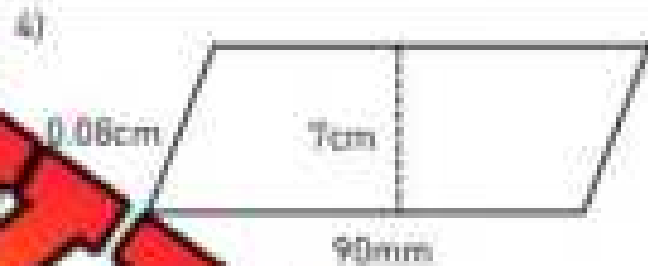
Perimeter = \_\_\_\_\_ Area = \_\_\_\_\_



Perimeter = \_\_\_\_\_ Area = \_\_\_\_\_



Perimeter = \_\_\_\_\_ Area = \_\_\_\_\_



Perimeter = \_\_\_\_\_ Area = \_\_\_\_\_

### Part 2

Answer the word problems below

A bathroom is being tiled with parallelogram shaped tiles. The tiles are below



1) What is the area of the parallelogram?

2) The dimensions of the bathroom are displayed below.

a) What is the area of the bathroom?



b) How many tiles will fit in the bathroom?

## Area of a Parallelograms - Word Problems

**Questions**

Answer the questions below

1) a) A parallelogram-shaped garden has a base of 9 meters and a height of 6 meters. One pair of the fence's opposite sides is 12 meters long each. If the gardener wants to put a fence around the garden, how much fence will they need?

b) If the fence costs \$10 per metre, how much will the fence cost?



2) A parallelogram-shaped greenhouse has a base of 5 meters and a height of 4 meters. The other two sides are 6 meters long each. How much room do they have inside the greenhouse to plant flowers?

3) a) A parallelogram-shaped rooftop has a base of 10 meters and a height of 10 meters. The other pair of opposite sides of the rooftop are 18 meters long each. How much room is there on top of the roof so they can install solar panels? How much room is there?

b) If one solar panel takes up 7 square metres, how many will they be able to fit on the roof?

c) If one solar panel is \$2450, how much will they spend on solar panels?

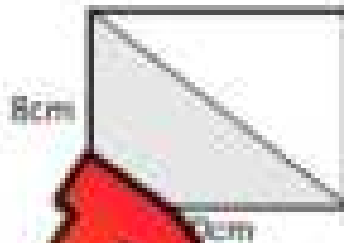
**PREVIEW**

## Introduction – Area of a Triangle

## Instruction

Find the area of the triangles below ( $A = b \times h \div 2$ )

1)



8cm

8cm

Area of a rectangle = \_\_\_\_\_

Area of a triangle = \_\_\_\_\_

2)



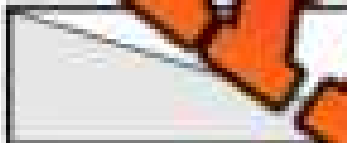
5cm

8cm

Area of a rectangle = \_\_\_\_\_

Area of a triangle = \_\_\_\_\_

3)



5cm

12cm

Area of a rectangle = \_\_\_\_\_

Area of a triangle = \_\_\_\_\_

4)



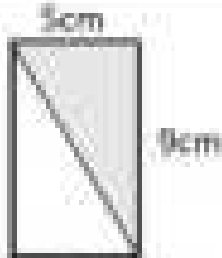
3m

6m

Area of a rectangle = \_\_\_\_\_

Area of a triangle = \_\_\_\_\_

5)



5cm

9cm

Area of a rectangle = \_\_\_\_\_

Area of a triangle = \_\_\_\_\_

6)



6cm

Area of a square = \_\_\_\_\_

Area of a triangle = \_\_\_\_\_

7)



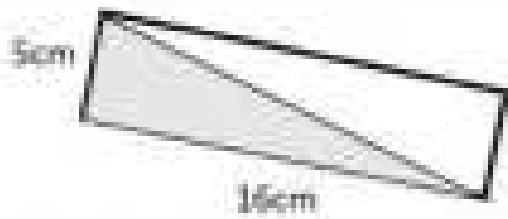
6cm

12cm

Area of a rectangle = \_\_\_\_\_

Area of a triangle = \_\_\_\_\_

8)



5cm

16cm

Area of a rectangle = \_\_\_\_\_

Area of a triangle = \_\_\_\_\_

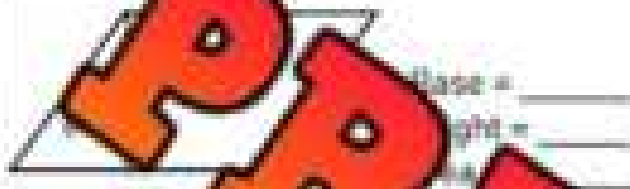
# Exit Cards

Cut Out

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

Name: \_\_\_\_\_

1) Find the missing value ( $A = b \times h$ )

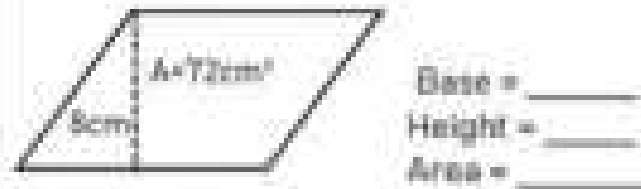


2) A painter is designing a triangular wall mural. The mural has a base of 3 meters and a height of 4 meters. What is the area of the mural in square meters?

\_\_\_\_\_

Name: \_\_\_\_\_

1) Find the missing value ( $A = b \times h$ )



2) A painter is designing a triangular wall mural. The mural has a base of 3 meters and a height of 4 meters. What is the area of the mural in square meters?

\_\_\_\_\_

Name: \_\_\_\_\_

1) Find the missing value ( $A = b \times h$ )



2) A painter is designing a triangular wall mural. The mural has a base of 3 meters and a height of 4 meters. What is the area of the mural in square meters?

\_\_\_\_\_

Name: \_\_\_\_\_

1) Find the missing value



2) A painter is designing a triangular wall mural. The mural has a base of 3 meters and a height of 4 meters. What is the area of the mural in square meters?

\_\_\_\_\_

## Activity: "Triangle and Parallelogram Toss Challenge"

### Objective

What are we learning about?

Students will reinforce their understanding of finding the area of triangles and parallelograms through a fun, team-based activity that involves answering questions and shooting a paper ball into a bin.

### Materials

What you will need for the activity:

- Index cards with area problems
- Recording sheets for each team
- Paper ball (made from a paper cone)
- Bins or baskets for teams
- Desks (one per team)



### Instructions

How you will play the activity:

1. Arrange the classroom so that there is enough room for multiple teams to work simultaneously. Place a desk about 10 feet away from a bin or basket.
2. Place a stack of index cards with area problems on each desk.
3. Provide each team with a recording sheet and a pen or pencil.
4. Divide the students into teams of about five members.
5. Each team stands in a line behind their respective desk.
6. The first student in line flips over an index card and solves the problem by writing the area of a triangle or parallelogram on the recording sheet.
7. Once the answer is recorded, the student attempts to shoot the paper ball into the bin.
8. If the student makes the shot, they place a tally mark on the team's tally sheet for a point. If they miss, no tally is given.
9. The student then goes to the end of the line, and the next student steps up to the desk to repeat the process.
10. The activity continues until all index cards have been solved.
11. Once all index cards are completed, the teacher collects the recording sheets and reviews the answers with the class.
12. For each incorrect answer, the team loses one point.
13. The team with the highest number of points after deductions is declared the winner.

## Index Cards

Cut out the cards below

A parallelogram has an area of  $36 \text{ m}^2$  and a height of 6 meters. What is its base?

A parallelogram has a base of 25 cm and a height of 10 cm. What is its area?

Calculate the area of a triangle with a base of 4 meters and a height of 3 meters.

The area of a triangle is  $56 \text{ cm}^2$  and the height is 8 cm. What is the base of the triangle?

The height of a parallelogram is 9 inches and its area is  $81 \text{ in}^2$ . What is the base?

Calculate the area of a parallelogram with a base of 12 m and a height of 500 cm.

A triangular plot of land has a base of 30 meters and a height of 20 meters. What is the area of the plot?

A triangle has an area of  $40 \text{ cm}^2$  and a base of 10 cm. What is its height?

**PREVIEW**

## Triangle and Parallelogram Toss Challenge

**Answers**

Record your answers below

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

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

PREVIEW

**Tally Chart**

Record your makes in the tally chart below

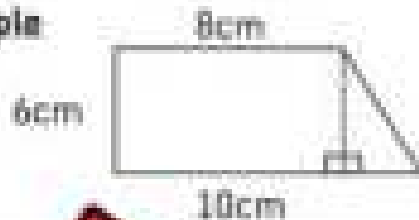
Tallies - Made Shots	Total

Wrong Answers	Final Score

## Area of Trapezoids

Find the area of the trapezoids below by splitting them into rectangles and triangles.

**Example**



Area = area of rectangle + area of triangle

Rectangle:

$$A = 8 \times 6$$

$$A = 48 \text{ cm}^2$$

Triangle:

$$A = 2 \times 6$$

$$A = 12 \div 2$$

$$A = 6 \text{ cm}^2$$

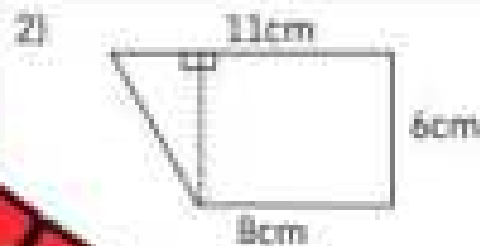
$$\text{Area} = 48 + 6$$

$$A = 54 \text{ cm}^2$$

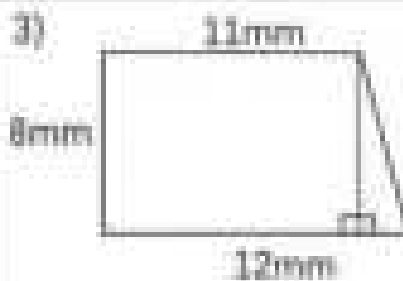
**Instructions** Find the area of the trapezoids.



Area = \_\_\_\_\_



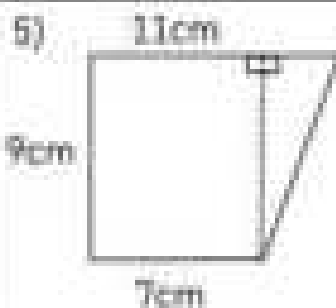
Area = \_\_\_\_\_



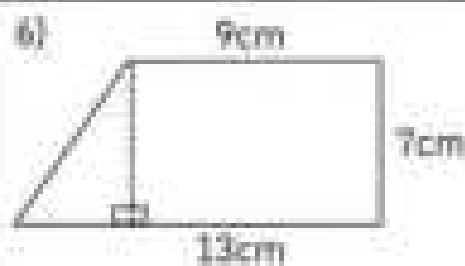
Area = \_\_\_\_\_



Area = \_\_\_\_\_



Area = \_\_\_\_\_

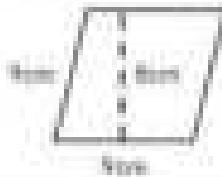


Area = \_\_\_\_\_

## Area of Rhombus – Using Base and Height

Find the area of each rhombus below using the base and height provided.

**Example**



$$\text{Area} = \text{base} \times \text{height}$$

$$\text{Area} = 9 \times 8 = 72$$

$$A = 72\text{cm}^2$$

**Instructions** Find the area of each rhombus below ( $a = b \times h$ )

1)

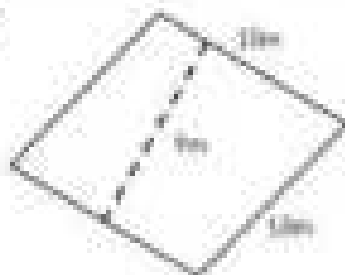


2)



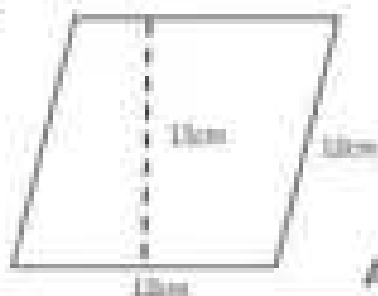
Area = \_\_\_\_\_

3)



Area = \_\_\_\_\_

5)



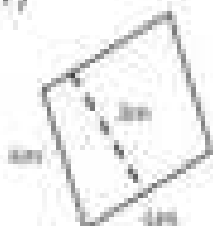
Area = \_\_\_\_\_

6)



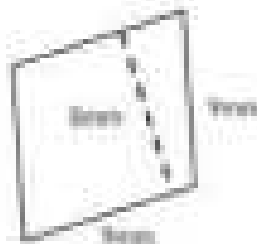
Area = \_\_\_\_\_

7)



Area = \_\_\_\_\_

8)

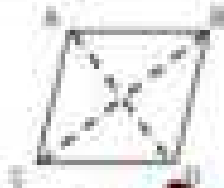


Area = \_\_\_\_\_

## Area of a Rhombus – Using Diagonal Length

Find the area of each rhombus below using the diagonal lengths.

**Example**



AD = 10cm      10cm

$$\text{Area} = \text{diagonal length 1} \times \text{diagonal length 2} \div 2$$

$$\text{Area} = 10 \times 10 \div 2$$

$$A = 50\text{cm}^2$$

**Instructions** Find the area of each rhombus below

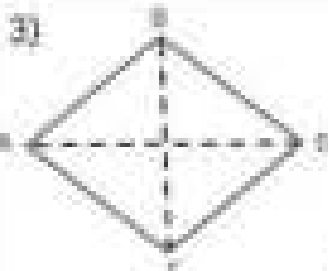


Area = \_\_\_\_\_



AD = 7m ; CB = 8m

Area = \_\_\_\_\_



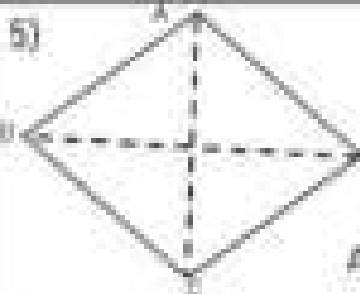
AD = 7mm ; BC = 7mm

Area = \_\_\_\_\_



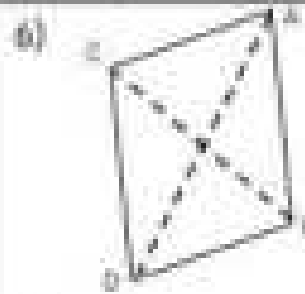
12cm ; CB = 8cm

Area = \_\_\_\_\_



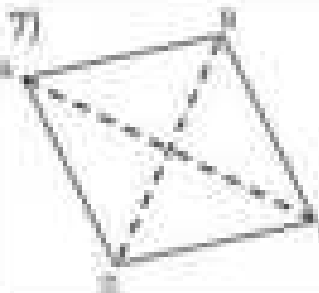
AC = 12m ; DB = 12m

Area = \_\_\_\_\_



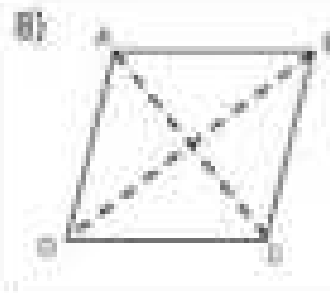
AD = 15cm ; CB = 10cm

Area = \_\_\_\_\_



AC = 13m ; BD = 8m

Area = \_\_\_\_\_



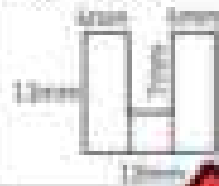
AC = 16cm ; BD = 16cm

Area = \_\_\_\_\_

# Area of Composite Polygons

Find the area of the polygons below by splitting them into separate shapes.

**Example**



Area = area of rectangle 1 + area of rectangle 2 + area of rectangle 3

Rectangle 1:  
 $A = 11 \times 12$   
 $A = 132 \text{ mm}^2$

Rectangle 2:  
 $A = 4 \times 4$   
 $A = 16 \text{ mm}^2$

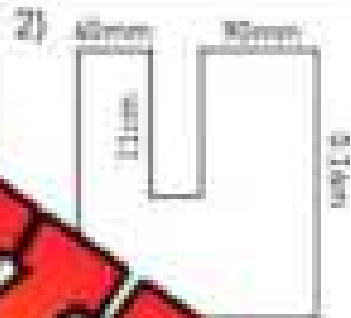
Rectangle 3:  
 $A = 4 \times 11$   
 $A = 44 \text{ mm}^2$

Area =  $132 + 16 + 44$   
 $A = 192 \text{ mm}^2$

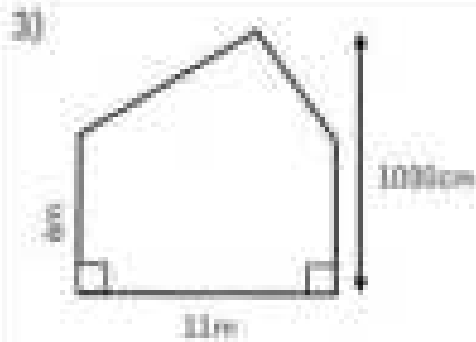
**Instructions** Find the area of the composite polygons below



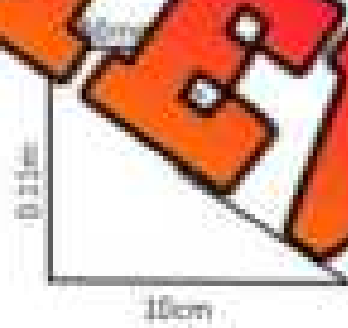
Area = \_\_\_\_\_



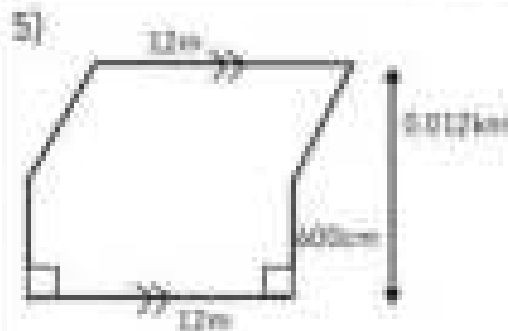
Area = \_\_\_\_\_



Area = \_\_\_\_\_



Area = \_\_\_\_\_



Area = \_\_\_\_\_



Area = \_\_\_\_\_

PREVIEW

# Exit Cards

Cut Out

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

Name: \_\_\_\_\_

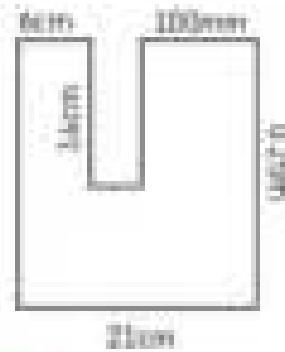
Find the area of composite shape



Area = \_\_\_\_\_

Name: \_\_\_\_\_

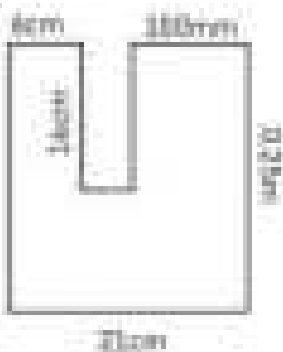
Find the area of composite shape



Area = \_\_\_\_\_

Name: \_\_\_\_\_

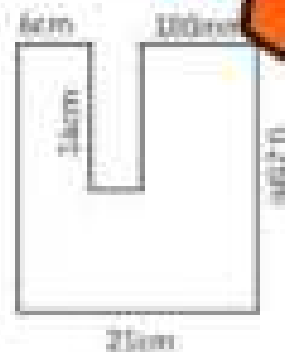
Find the area of composite shape



Area = \_\_\_\_\_

Name: \_\_\_\_\_

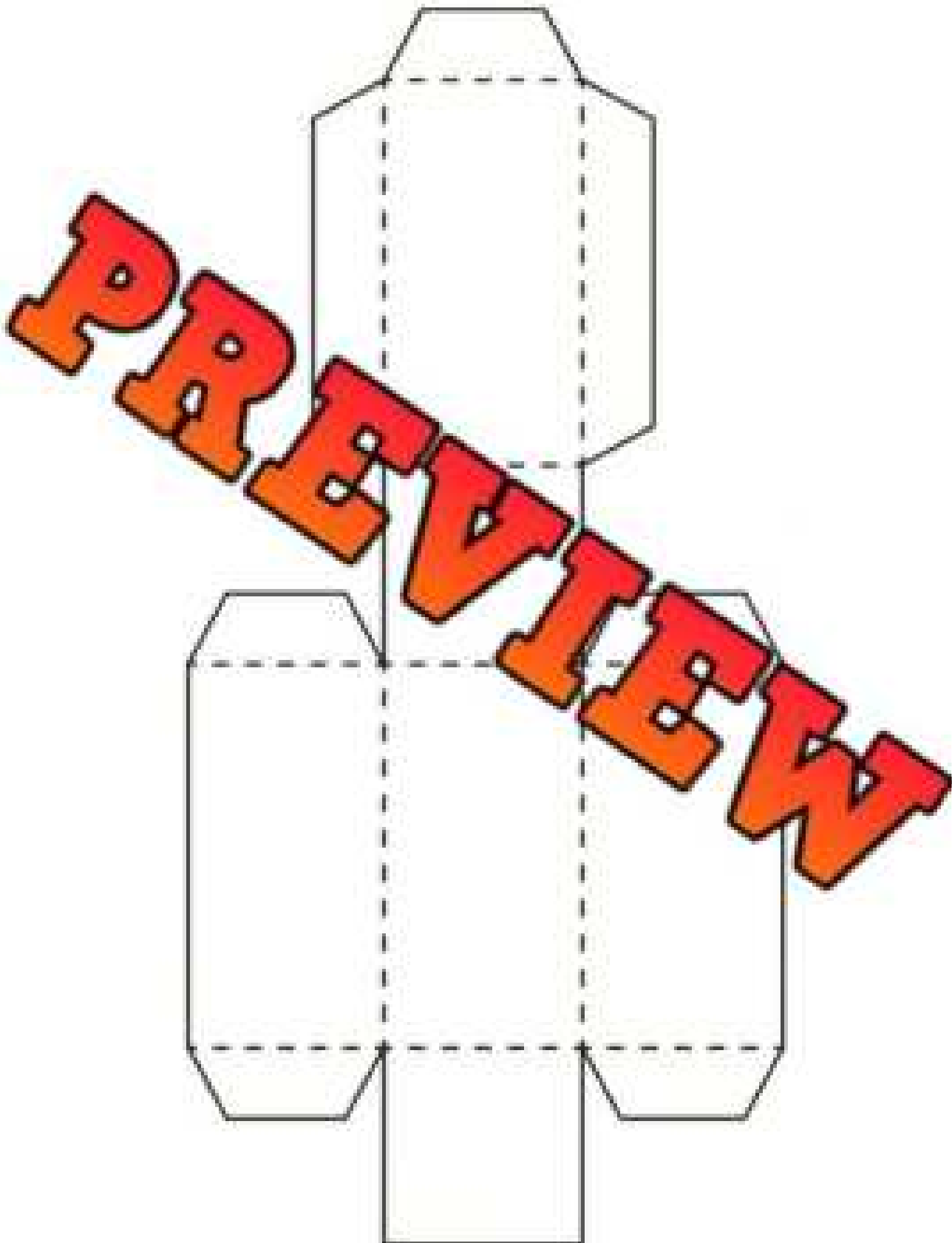
Find the area of



Area = \_\_\_\_\_

**PREVIEW**

**3D Model – Rectangle Based Prism Net**



# 3D Model – Triangle Based Pyramid Net



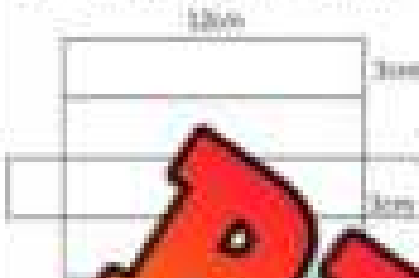


## Surface Area Using Nets – Rectangular Prisms

### Instruction

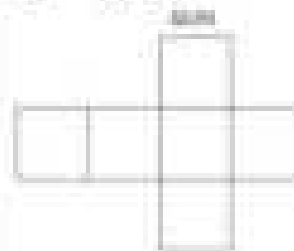
Find the surface area of the 3D objects using the nets below.

1) Rectangular Prism



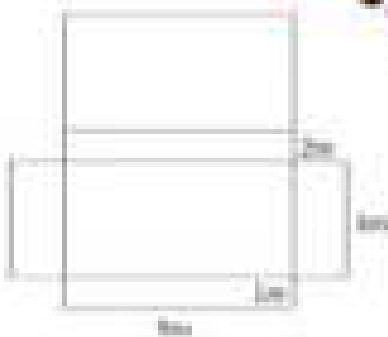
Surface Area: \_\_\_\_\_

2) Cube



Surface Area: \_\_\_\_\_

3) Rectangular Prism



Surface Area: \_\_\_\_\_

4) Triangular Prism



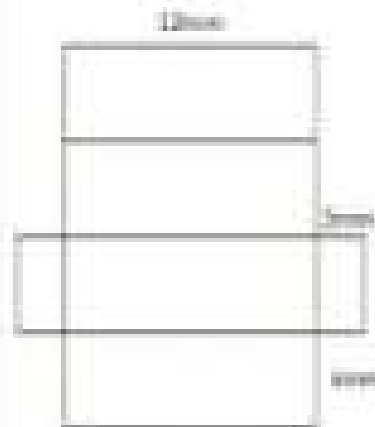
Surface Area: \_\_\_\_\_

5) Triangular Prism



Surface Area: \_\_\_\_\_

6) Rectangular Prism



Surface Area: \_\_\_\_\_

## Calculating Surface Area Using Nets – Rectangular Prisms

### Instruction

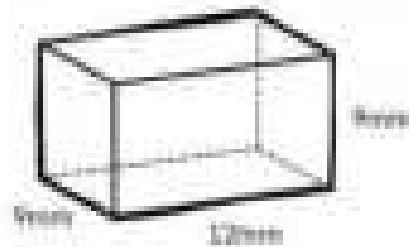
Find the surface area of the 3D shapes below

1) Rectangular Prism



Surface Area: \_\_\_\_\_

2) Rectangular Prism



Surface Area: \_\_\_\_\_

3) Triangular Prism



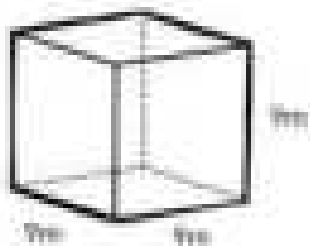
Surface Area: \_\_\_\_\_

4) Rectangular Prism



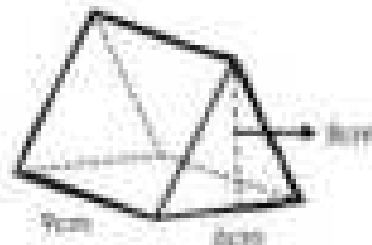
Surface Area: \_\_\_\_\_

5) Cube



Surface Area: \_\_\_\_\_

6) Triangular Prism



Surface Area: \_\_\_\_\_

# Exit Cards

Cut Out

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

Name: \_\_\_\_\_

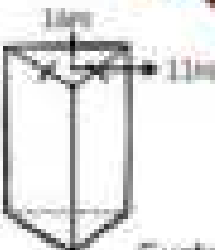
Find the surface area of the Cube below

A)



Surface Area = \_\_\_\_\_

B)

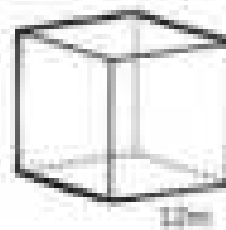


Surface Area = \_\_\_\_\_

Name: \_\_\_\_\_

Find the surface area of the Cube below

A)



Surface Area = \_\_\_\_\_

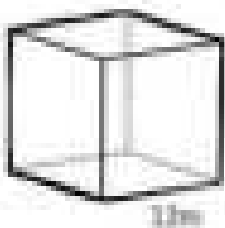


Surface Area = \_\_\_\_\_

Name: \_\_\_\_\_

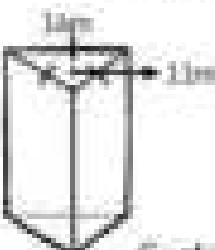
Find the surface area of the Cube below

A)



Surface Area = \_\_\_\_\_

B)

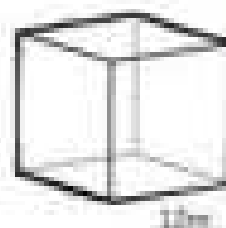


Surface Area = \_\_\_\_\_

Name: \_\_\_\_\_

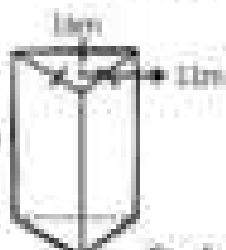
Find the surface area of the Cube below

A)



Surface Area = \_\_\_\_\_

B)



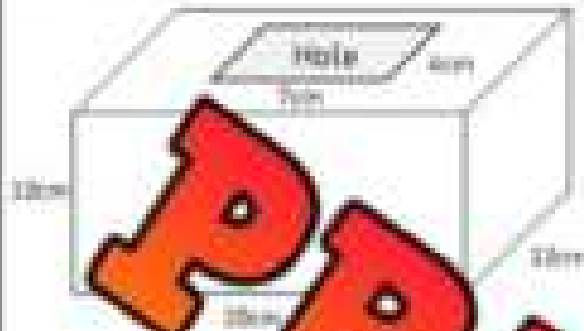
Surface Area = \_\_\_\_\_

**PREVIEW**

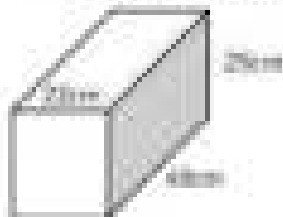
**Surface Area – Prism – Word Problems****Instruction**

Solve the word problems below

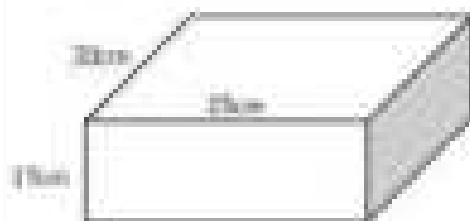
- 1) Find the surface area of the tissue box below.



- 2) Edward is painting a mailbox. He needs to find the surface area so he can buy the amount of paint. The mailbox has no door on the front. Find the surface area of the mailbox in the diagram below.



- 3) Kaitlyn needs to wrap her mom's birthday present. She has enough wrapping paper to cover a surface area of  $3500\text{cm}^2$ . Does she have enough paper?

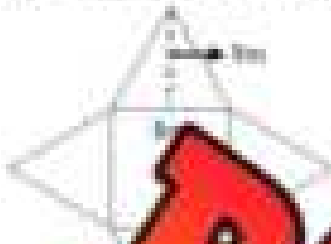


## Calculating Surface Area - Pyramids

**Instruction**

Solve the questions below

1) Square Pyramid



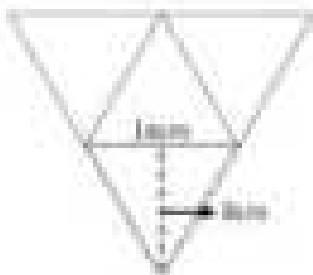
Surface Area: \_\_\_\_\_

2) Triangular Pyramid



Surface Area: \_\_\_\_\_

3) Triangular Pyramid



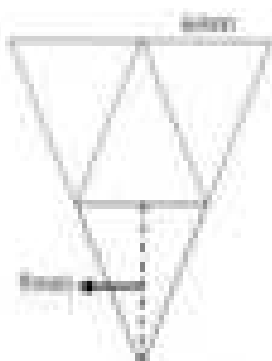
Surface Area: \_\_\_\_\_

4) Square Pyramid



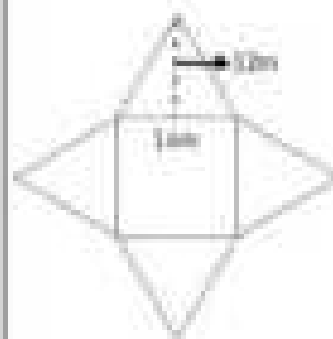
Surface Area: \_\_\_\_\_

5) Triangular Pyramid



Surface Area: \_\_\_\_\_

6) Square Pyramid



Surface Area: \_\_\_\_\_

PREVIEW

## Calculating Surface Area - Pyramids

**Instruction**

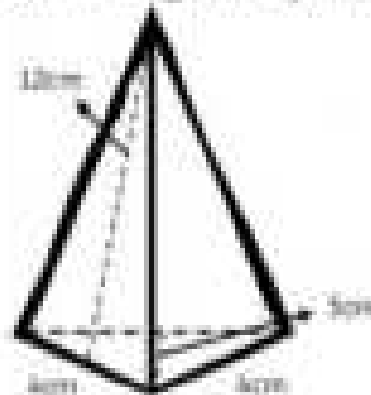
Solve the questions below

1) Triangular Pyramid



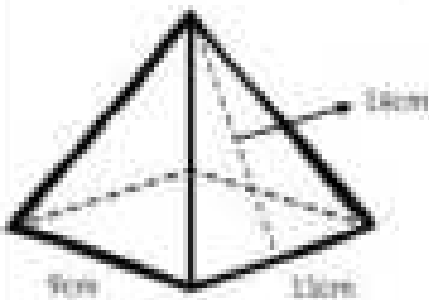
Surface Area: \_\_\_\_\_

2) Triangular Pyramid



Surface Area: \_\_\_\_\_

3) Rectangular Pyramid



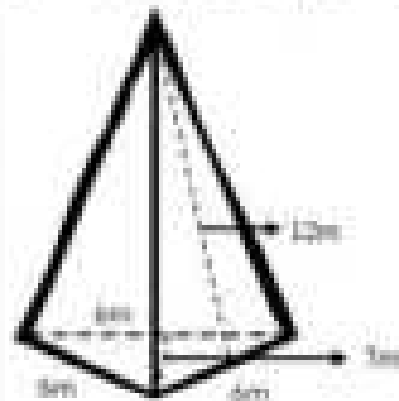
Surface Area: \_\_\_\_\_

4) Square Pyramid



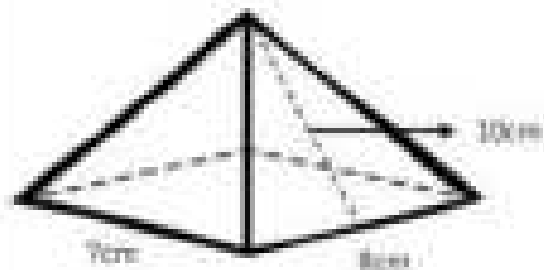
Surface Area: \_\_\_\_\_

5) Triangular Pyramid



Surface Area: \_\_\_\_\_

6) Rectangular Pyramid



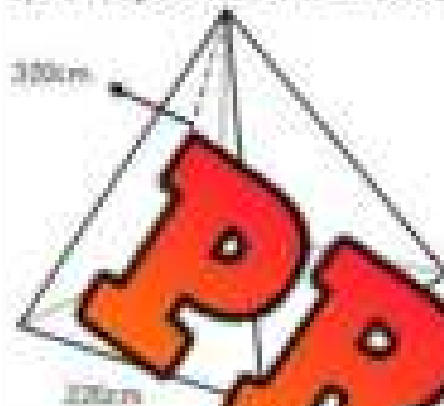
Surface Area: \_\_\_\_\_

## Surface Area – Pyramids – Word Problems

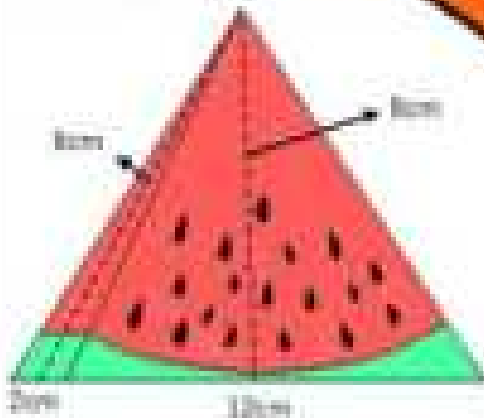
**Instruction:**

Solve the questions below

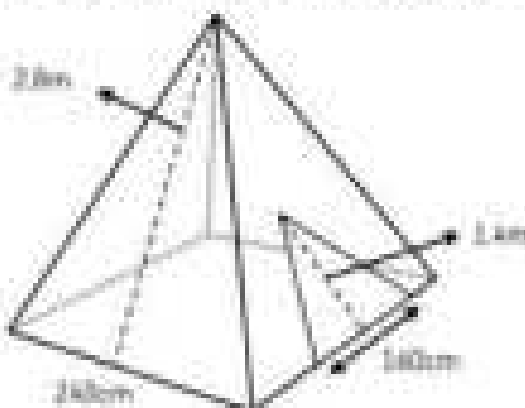
1) A teepee has the measurements below. What is the surface area of the teepee?



2) A piece of watermelon is shaped like a square pyramid. Its dimensions are shown below. What is the surface area of the watermelon?



3) A square based tent has the measurements below. What is the surface area of the tent with the door open (as shown)?

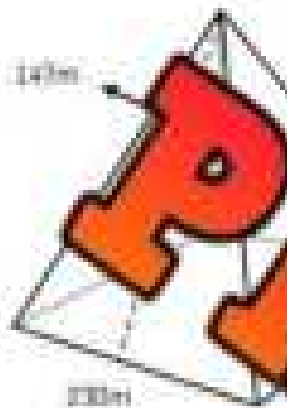


## Surface Area – Pyramids – Word Problems

**Instruction**

Solve the questions below

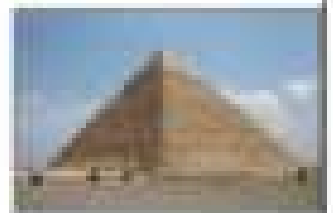
The Great Pyramid at Giza in Egypt has a square base. Its measurements are detailed in the diagram below.



a) What is the surface area of the pyramid?

b) The stones used to build the pyramid are made of limestone, in the shape of rectangular prisms. If the surface area of these blocks is  $20\text{m}^2$ , how many blocks would it take to build the pyramid?

c) If it took 30 minutes to lay one block, how many hours would it take to build the pyramid?



Name \_\_\_\_\_

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## Measurement Unit Test

Part 1

Convert the units of measurement below

1) 1.7m

\_\_\_\_\_ mm

2) 6.2km

\_\_\_\_\_ m

3) 6428m

\_\_\_\_\_ km

4) 2.4L

\_\_\_\_\_ mL

5) 9.7kL

\_\_\_\_\_ L

6) 4053L

\_\_\_\_\_ kL

7) 3g

8) 7.65kg

\_\_\_\_\_ g

9) 7129.5g

\_\_\_\_\_ kg

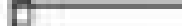
Part 2

Measure the angles and label them acute, right, obtuse, or reflex.

1)



3)



4)



5)



6)



7)



Part 3

Use a protractor to draw the angles below using the line provided

1)

 $\angle = 60^\circ$ 

2)

 $\angle = 98^\circ$ 

3)

 $\angle = 147^\circ$



## Part 8

Determine the supplementary angles

1) 	2) 	3) 
$\angle BDA = \underline{\hspace{2cm}}^\circ$	$\angle FEH = \underline{\hspace{2cm}}^\circ$	$\angle KLJ = \underline{\hspace{2cm}}^\circ$

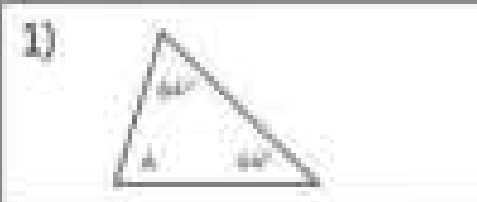
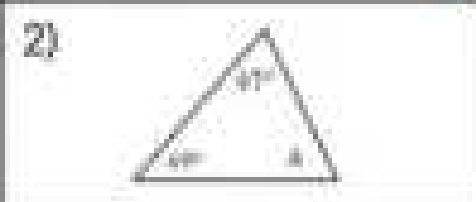
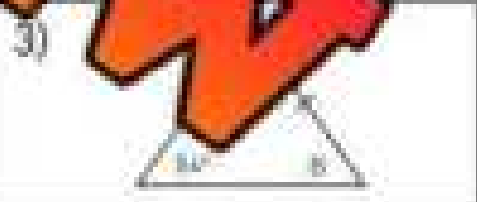
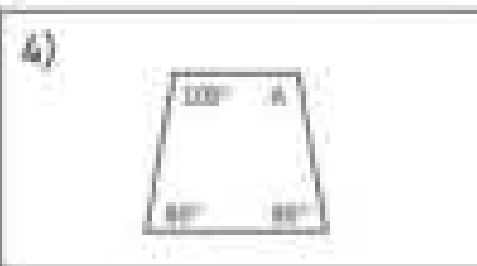
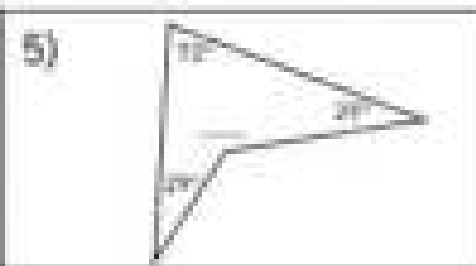
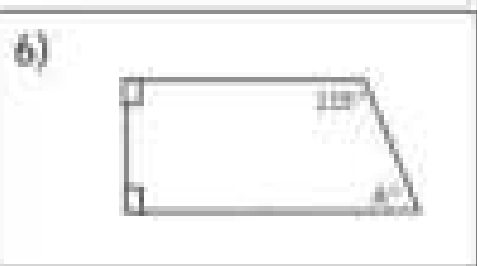
## Part 9

Find the values of the unknown angle measurements

1) 	3) 
A =	A =
C =	C =
D =	D =

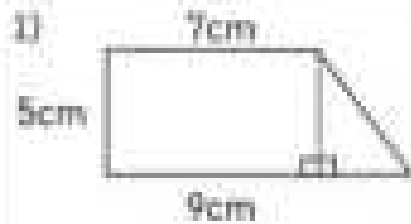
## Part 10

Find the values of the unknown angles

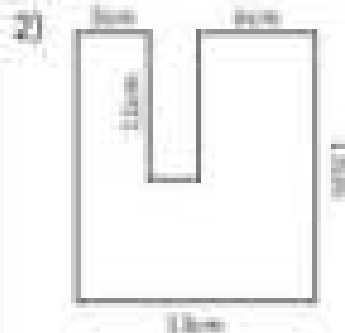
1) 	2) 	3) 
A =	A =	A =
4) 	5) 	6) 
A =	A =	A =

## Part 11

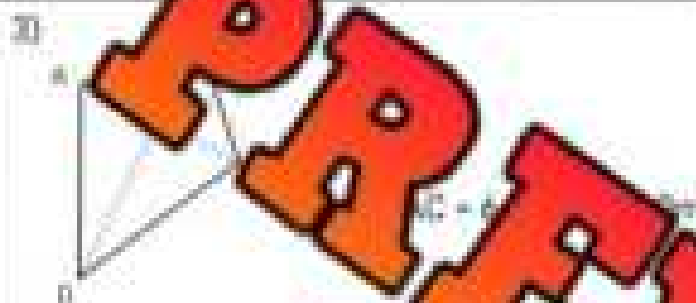
Find the area of the shapes below



Area = \_\_\_\_\_



Area = \_\_\_\_\_



Area = \_\_\_\_\_

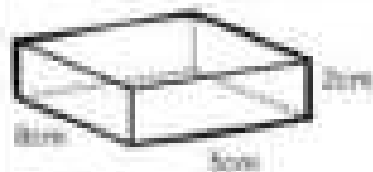


Area = \_\_\_\_\_

## Part 12

Find the surface area of the 3D shapes below

## 1) Rectangular Prism



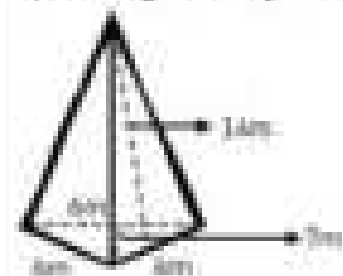
Surface Area: \_\_\_\_\_

## 2) Rectangular Prism



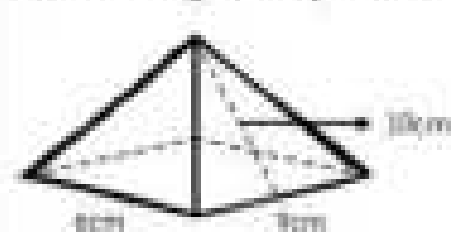
Surface Area: \_\_\_\_\_

## 3) Triangular Pyramid



Surface Area: \_\_\_\_\_

## 4) Rectangular Pyramid



Surface Area: \_\_\_\_\_