

Grade 6 Math
Data Relationships Notes
Unit 4

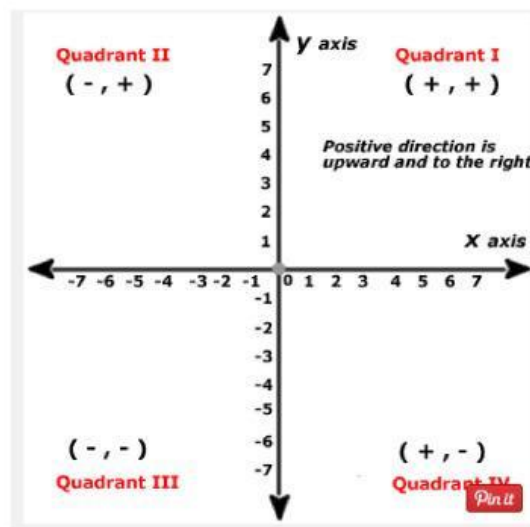
Name: _____

Class: _____

The **Cartesian plane** is named after the mathematician Rene Descartes. When 2 perpendicular number lines intersect, a **Cartesian Plane** is formed. Points on the Cartesian plane are called '**ordered pairs**'.

Ordered Pair: Can be used to show the position on a graph, where the "x" (horizontal) value is first, and the "y" (vertical) value is second.

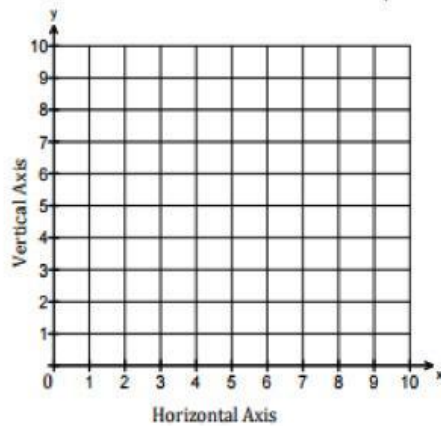
Origin: The point at which the two axes intersect. As an ordered pair, it is (0,0).



Where in real life do you see grids?

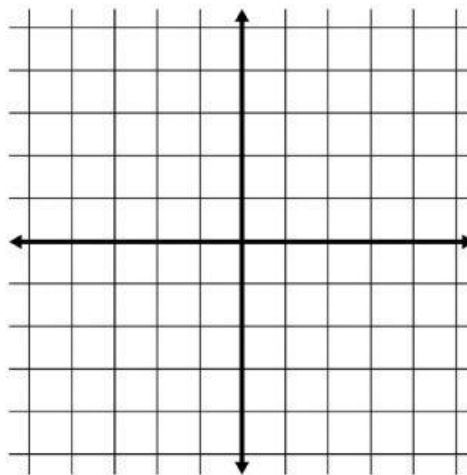
1. GPS systems
2. Mapping

Problem 1: Label the axis of the coordinate grid and identify the **Origin**.

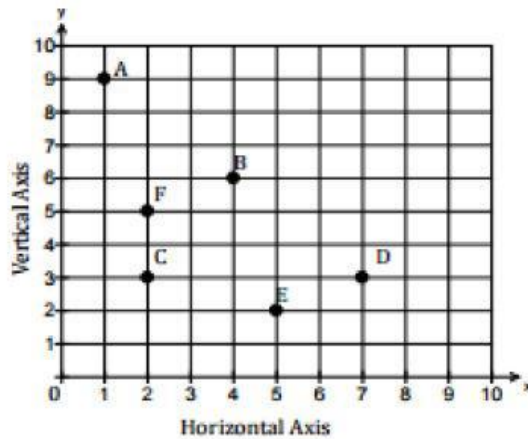


Be careful! A common error students make when labelling the axes is putting the number in the middle of the blocks (in between grid lines). This may cause you to have difficulty when plotting ordered pairs.

Problem 2: Here is an unlabelled coordinate grid. Label the y-axis using a blue marker, the x-axis using a red marker, and the origin using a yellow marker.



Problem 3: Sometimes an ordered pair is identified with a capital letter on the coordinate grid, as shown below.



List the ordered pair of the following points:

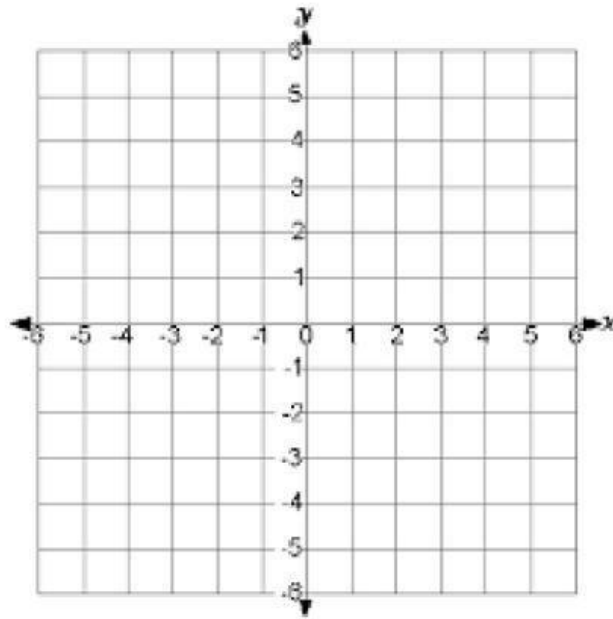
A: _____ B: _____ C: _____

D: _____ E: _____ F: _____

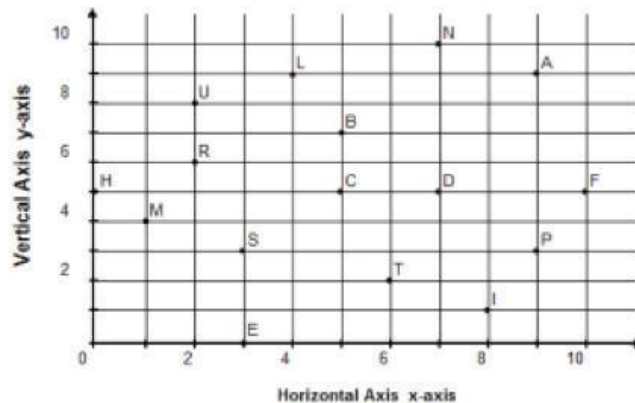
Ordered Pairs Game!

Directions:

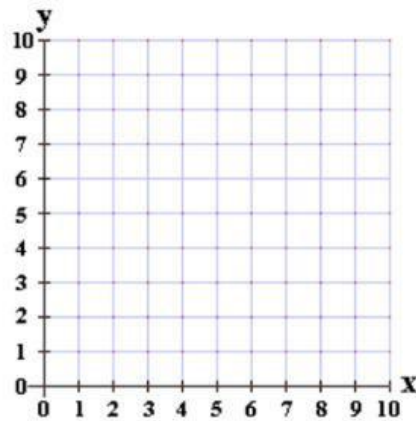
1. Randomly place 10 points anywhere on your grid.
2. The teacher will call out random ordered pairs.
3. If you have that point on their grid, mark an X through it.
4. The first student to have all of their points marked with an X wins!



Problem 4: Find the letter on the grid represented by each ordered pair. Record the letters, in order, to figure out the message. (1, 4) (9, 9) (6, 2) (0, 5) (8, 1) (3, 3) (10, 5) (2, 8) (7, 10)



Problem 5: Plot several points along the x-axis and the y-axis such as (2, 0), (4, 0), (7, 0) and (0, 1), (0, 3), (0, 7).

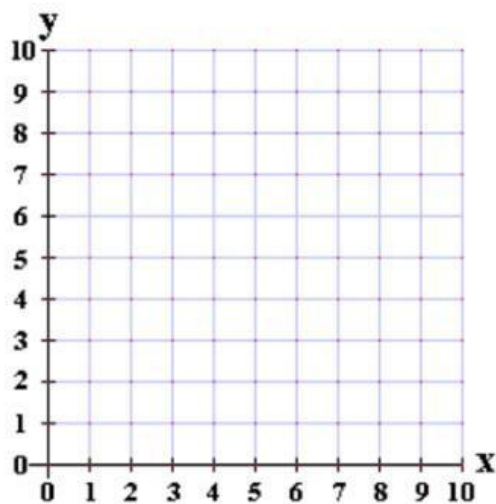


What can you say about an ordered pair having zero for the y-coordinate?

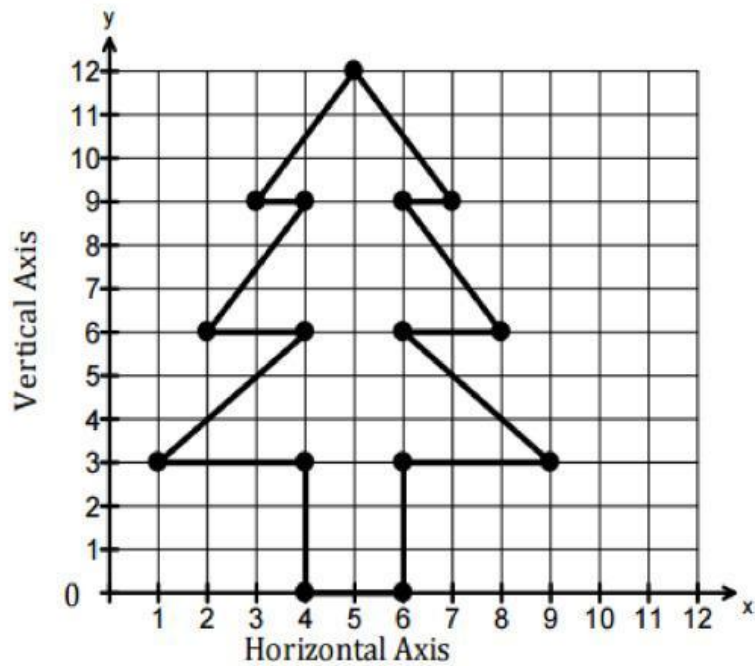
What about the x-coordinate?

Problem 6: Plot the points listed below and join them in order. The last point should be joined to the first point. Describe the figure you have drawn.

A(2,2), B(5,3), C(8,2), D(7,5), E(9,8), F(6,7), G(5,10), H(4,7), I(1,8), J(3,5)

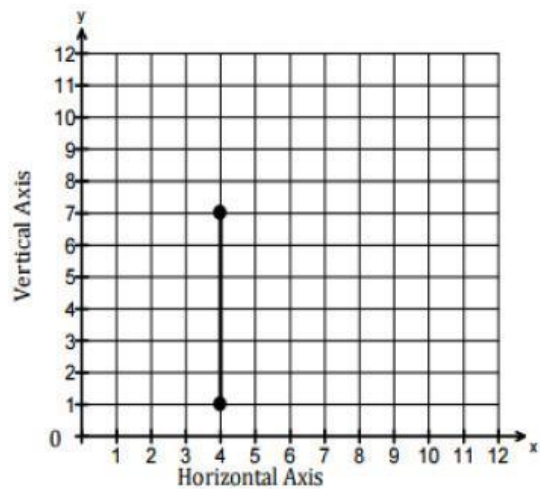
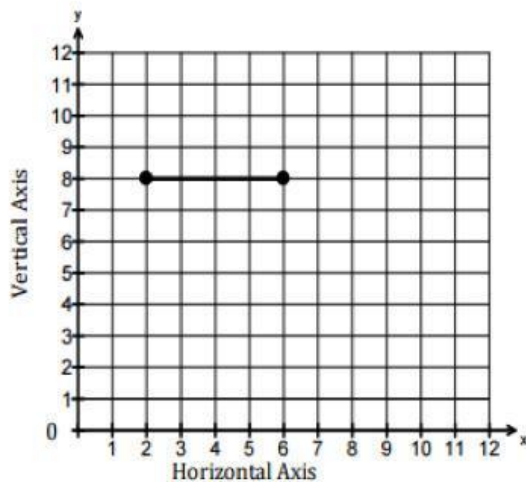


Problem 7: List the points that were used to create the object below.



Points:

Problem 8: What is the length of the following lines?



*****Note:** To determine the horizontal distance between two points you subtract the x coordinates and to determine the vertical distance between two points subtract the y coordinates

When the numbers in an ordered pair are large, you must use an interval other than 1 on the coordinate grid. The interval used is also referred to as the scale.

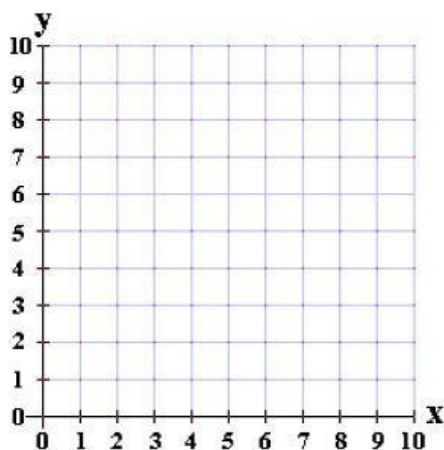
How would you plot the point (50, 100)? It is unreasonable to sketch a coordinate grid using an interval of 1 to plot (50, 100). A scale of 10 may be more appropriate for this example. When asked to plot ordered pairs, look at how big the numbers are before choosing a scale.

Problem 9: What scale would you use to plot:

- a) (16, 20)?
- b) (4, 7)?
- c) (25, 15)?
- d) (70, 120)?
- e) Why would a scale of 1 not be best to plot (40, 60)?

Problem 10: Plot each pair of points on the grid, join the points with a line segment and find the length of each line segment.

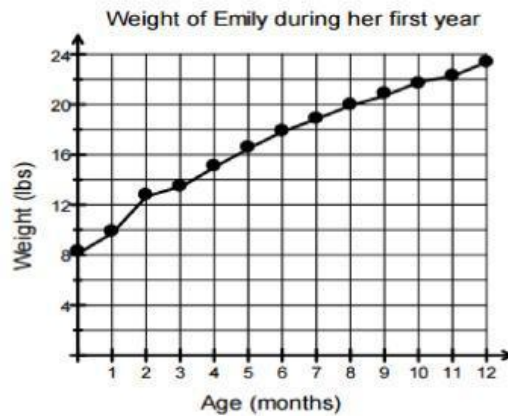
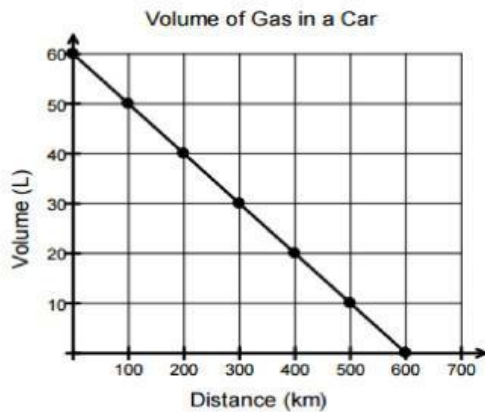
- (i) (4,2) and (7,2) Length: _____
- (ii) (5,7) and (10,7) Length: _____



Practice Questions (***)you can use the grid paper at the back of this booklet)

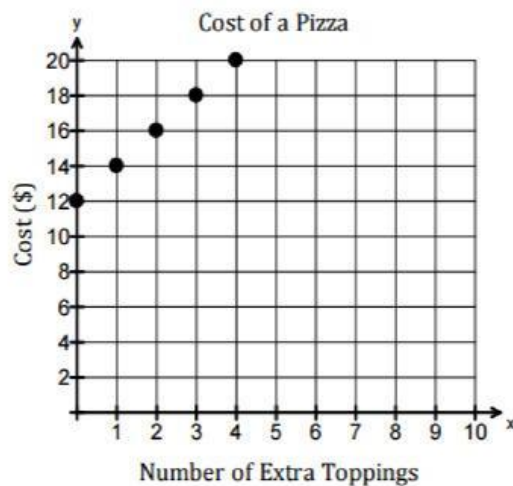
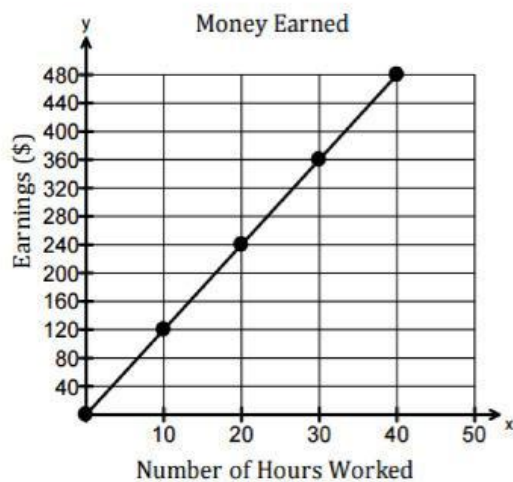
p.122-123 #2,3,4,5,6,8 & p. 134 #1,2, 3 (a,b,c),4

Problem 11: What do these graphs have in common?



***line graphs have common characteristics: a title, axes, and intervals.

Problem 12: The first data is said to be continuous (points are connected), and the second set is said to be discrete (points not connected).



Why aren't the points connected in the second graph?

- **Examples of discrete data** – the number of DVDs sold each day for one month, the number of cans recycled each month for year, the number of text messages you receive each day for a week, the number of siblings a person has.

- **Examples of continuous data** – the distance you travel throughout a race, the temperature of your hometown over a 24 hour period, your height as you get older, the percentage of battery life remaining on your iPad throughout the day

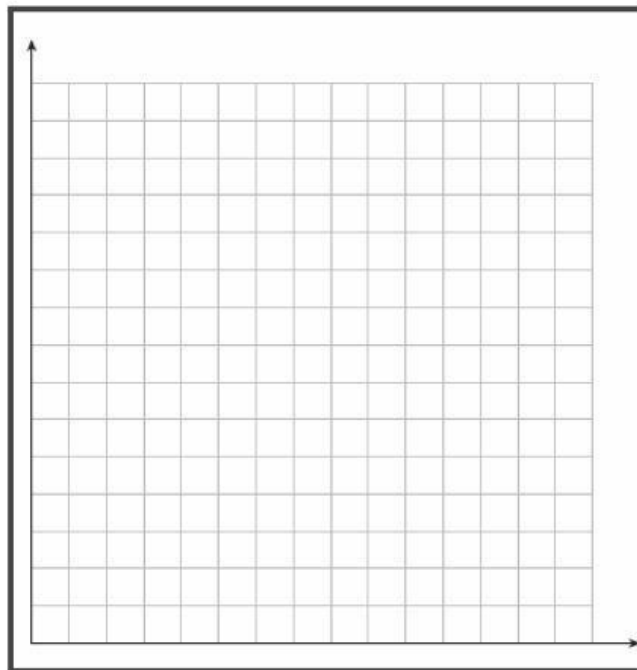
Problem 13: Create a line graph for the following situation:

Sandra is buying movie tickets for her classmates. The table below shows the relationship between the number of tickets and the cost.

Number of Tickets	0	1	2	3	4	5
Cost (\$)	0	10	20	30	40	50

Ask students to graph the table of values and answer questions such as the following:

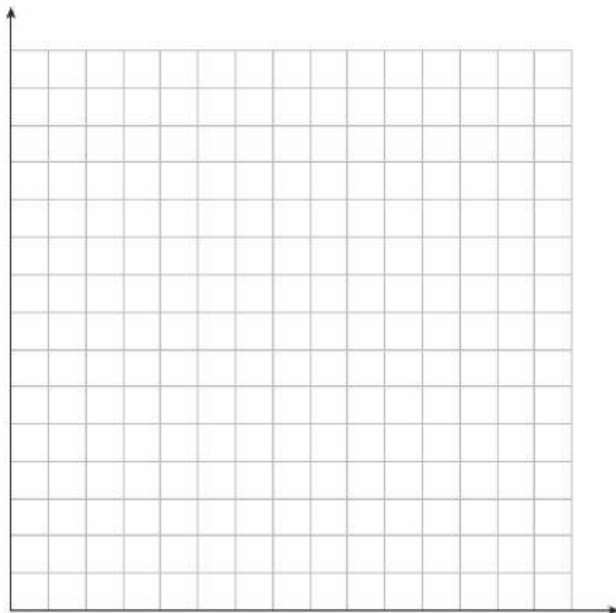
- Should you join the points on the graph? Explain.
- What is the trend between the number of tickets purchased and cost?
- How can you use the graph to determine the cost of 6 students attending?



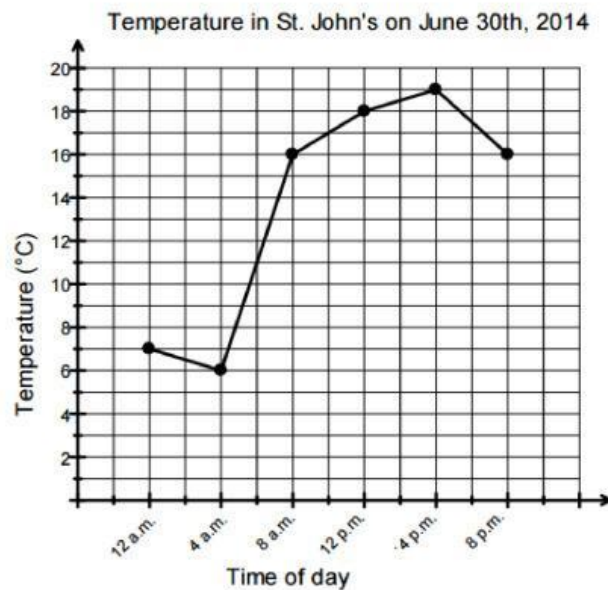
Problem 14: Is the data discrete or continuous?

- (i) the number of cans and bottles each class recycles each month
- (ii) your height measured over 10 months
- (iii) the number of students who are absent in school for each day of the month
- (iv) how much time you spend on homework each night for the month of March

Problem 15: For the pattern below, create a table of values and create a graph. Should you connect the points on the graph? Why or why not?



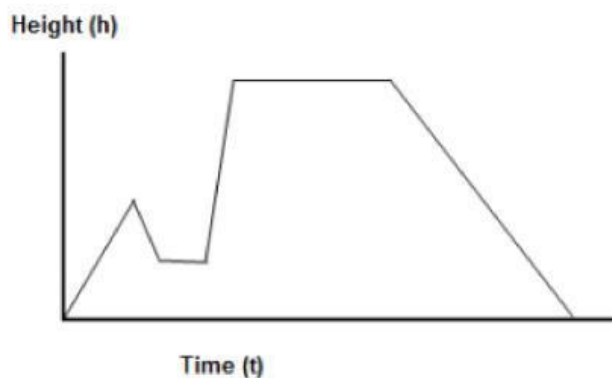
Problem 16: Answer the questions that follow the graph.



Ask students questions such as the following:

- What was the highest temperature?
- What was the lowest temperature?
- How much warmer was it at 2:00 p.m. than at 10:00 a.m.?

Problem 17: Describe the graph below by creating a story that shows Ethan's hike.



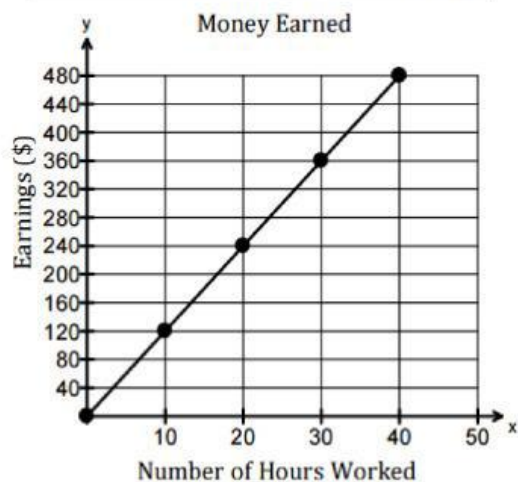
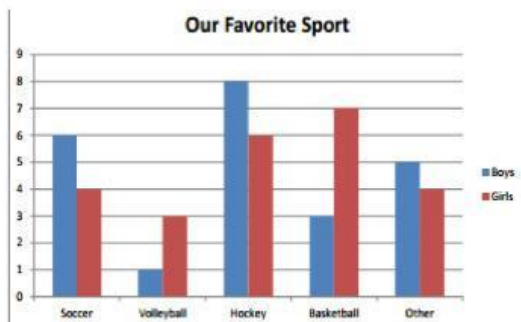
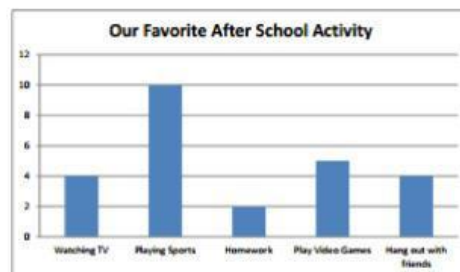
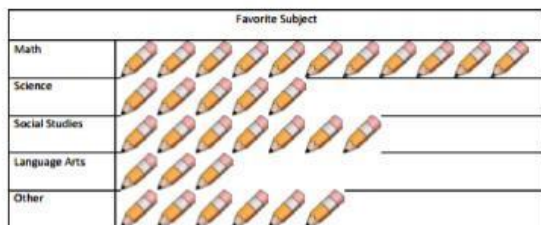
Practice Questions

p.128-129 #1,2,3,4,5,

The following table may be useful in selecting an appropriate graph to display collected data:

Type of Graph	Uses	Example
Pictograph	To compare data that can be easily counted and represented using symbols	Favorite movie genre of your classmates
Bar graph	To compare data grouped in categories	Favorite restaurant of your classmates
Double Bar graph	To comparing two sets of data grouped in categories	Favorite video game of Grade 5 students. Favorite video game of Grade 6 students.
Line Graph	To show change; to compare measurement	Temperature throughout the day

Problem 18: Why do you think each graph was used to display each data?



Pictograph: _____

Bar Graph: _____

Double Bar Graph: _____

Line graph: _____

Problem 19: What type of graph would you use to represent the following situations?

- How fast does a cup of hot chocolate cool down after it has been poured?
- What is the favourite season of Grade 6 boys and girls?
- What was the highest temperature in (insert hometown) today?
- A store manager keeps track of video game sales for one month.

Week	Video Games Sold
1	16
2	28
3	45
4	62

Problem 20:

Graph One - Students should select one of the following situations and graph the collected data:

Average Monthly Precipitation in Newfoundland and Labrador:		
January 9cm	February 10cm	March 13cm
April 20cm	May 22cm	June 16cm
July 6cm	August 8cm	September 5cm
October 7cm	November 5cm	December 9cm

Number correct on a Math Test:		
Anthony 60	Anna 80	Hannah 95
Hunter 100	Matthew 80	Ashley 70
David 65	Amanda 75	Sarah 90

Students should justify their choice of graph.

Practice Questions

p.118-119 #2,3,5