

Creating and Analyzing a Survey

Goal

Collect, organize, and display the results of a survey.

Trudy wants to know about TV-watching habits of students in her school. She wrote a question for a survey.

1. How often do you watch TV?
 - a) never
 - b) once or twice a week
 - c) three times a week
 - d) more than three times a week
 - e) every day

1. What is another survey question Trudy could ask?

2. Trudy asked the students in her school for how long they watch TV at any one time. She recorded the results in a tally chart.

About 1 h	About 2 h	About 3 h	About 4 h	More than 4 h
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Sketch a graph to display the results.

3. Explain why you chose the kind of graph you did.

At-Home Help

A **survey** is a list of questions to ask a group of people. The purpose of a survey is to learn specific information about a topic.

Remember to survey an appropriate group of people and a large enough number of people.

Survey questions should be worded so that you can get meaningful answers from people.

Do not use questions that give "yes" or "no" answers.

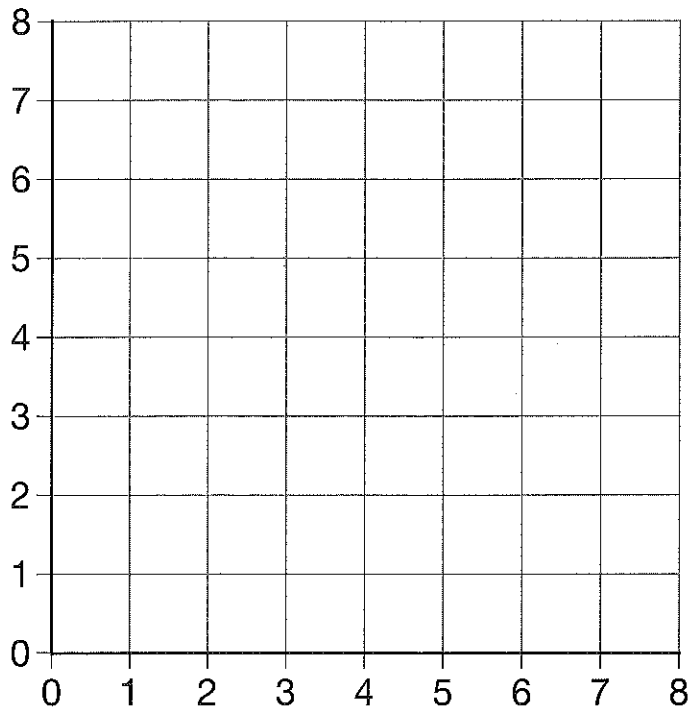
Survey results are usually collected using tally charts. You can display survey results on a graph.

Plotting Coordinate Pairs

Goal Plot points on a grid and locate them using coordinate pairs.

Yuri is plotting the shape of a stop sign he saw on a street.

- Plot the points $(3, 4)$, $(3, 5)$, $(4, 6)$, and $(5, 6)$ on the grid. Connect the points in order.

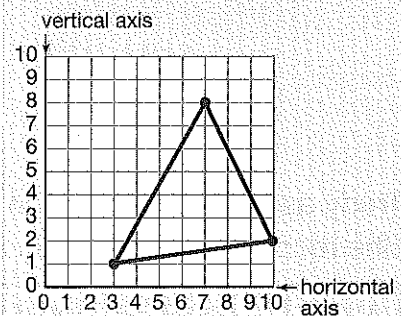


- Draw the rest of the sign on the grid above.
- What coordinate pairs did you use to complete the sign?
- What shape is the sign?

At-Home Help

A **coordinate grid** is a grid with each horizontal line and vertical line numbered in order. A **coordinate pair** identifies a location on a coordinate grid. Each pair describes where a vertical line and a horizontal line meet. The coordinate from the horizontal axis is always written first.

For example, the vertices of the triangle below have coordinates $(3, 1)$, $(7, 8)$, and $(10, 2)$.



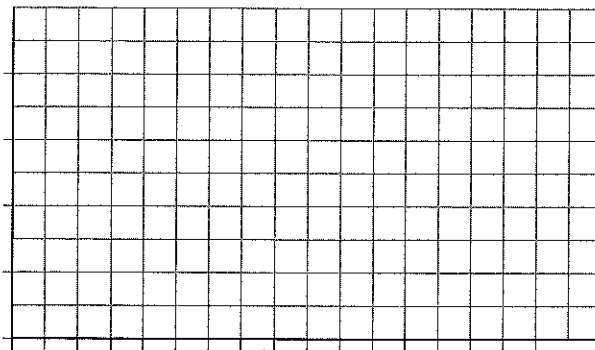
Line Graphs

Goal Create and interpret line graphs.

1. Sui earns money shovelling snow from his neighbour's sidewalk. He wants to know the length of sidewalk he must shovel to earn \$5.00. He recorded the distance he shovelled and how much he earned.

Distance (m)	4	8	12	16
Earnings	\$1.00	\$2.00	\$3.00	\$4.00

- a) Use the data in the table to create a graph.



- b) Describe how your graph appears.

- c) Estimate how much Sui earns for a distance of 8.3 m.

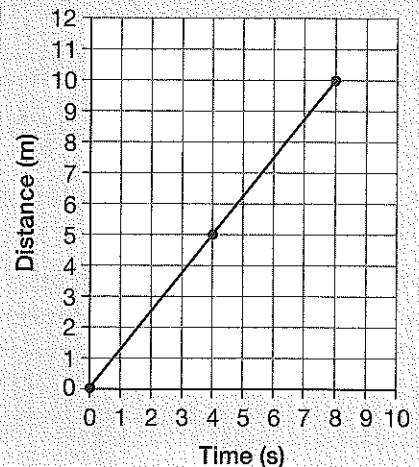
- d) Predict the distance Sui must shovel to earn \$5.00. Explain your reasoning.

At-Home Help

A **line graph** is a graph of a line through points. This type of graph shows how the change in one value is related to a change in another value.

For example, the graph below is a line graph showing the distance a bicycle travels over time.

Distance Bicycle Travels Over Time



To predict how far the bicycle will travel in 20 s, you can either extend the graph or use estimation. It takes 4 s for the bicycle to travel 5 m. So in 20 s the bicycle will travel about 25 m.

Mean and Median

Goal

Use mean and median to compare sets of data.

- Determine the mean and median of each set of numbers.
 - 8, 0, 2, 7, 1, 7, 3
 - 2, 3, 6, 0, 0, 1, 1
 - 7, 0, 9, 0
 - 18, 11, 22, 9, 5, 0
- Zoë recorded how long each of her friends walked on two days.

Student	Time on day 1 (min)	Time on day 2 (min)
Clara	20	25
Jose	10	9
Tia	15	18
Nicolas	8	20
Mario	18	19
Tim	5	17
Leah	12	8

- Determine the median time for each day.
 - On which day did the most walking occur?
- Sara said that the median does not have to be one of the numbers in a set. Is her statement correct? Explain.

At-Home Help

The **median** is the middle number in a set of numbers arranged in order.

For example, the median of 4, 5, 2, 3, 4 is 4.

2 3 **4** 4 5

If the set has an even number of items, the median is halfway between the two middle numbers.

For example, in the set 3, 2, 7, 8, 9, 11, the median is halfway between 7 and 8.

2 3 7 8 9 11

7.5

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The **mean** is the sum of a set of numbers divided by the number of numbers in the set. For example, the mean of 3, 4, 5, 2, 2, 3, 2 is $21 \div 7 = 3$.

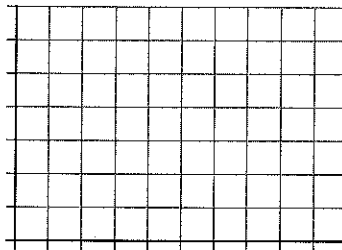
Changing the Scale on a Graph

Goal Describe how changing the scale changes a line graph.

Charmaine wants to know how fast a bowl of hot soup cools. She measured the temperature of the soup every minute.

Time (min)	0	1	2	3	4	5	6	7	8	9	10
Temperature (°C)	70	68	65	62	58	55	53	51	49	46	45

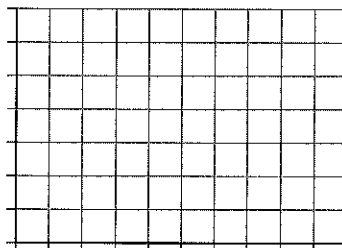
- Sketch a line graph of Charmaine's data.



- What scale did you use for the vertical axis?

What scale did you use for the horizontal axis?

- Predict how your graph in Question 1 would change if you doubled the value of each unit on the scale of the vertical axis. Sketch the line graph to check your prediction.



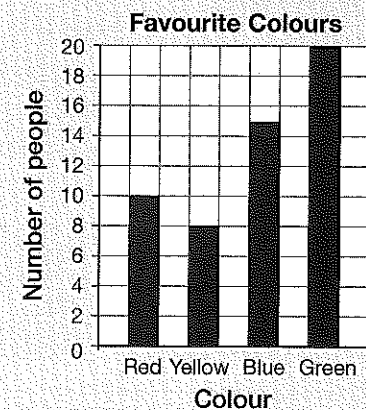
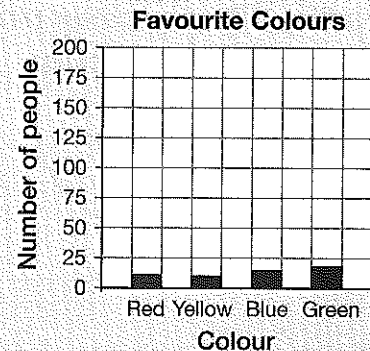
At-Home Help

The **scale** of a bar or line graph refers to the numbers on the vertical and horizontal axes.

The scale of a graph can affect the appearance of data.

For example: On the first graph, the scale of the vertical axis goes from 0 to 200. There isn't much difference between the bars.

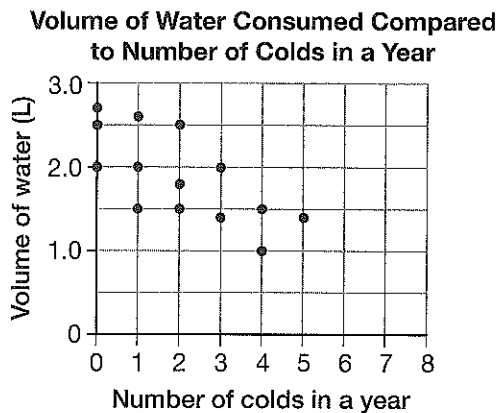
On the second graph, the scale of the vertical axis goes from 0 to 20. There is an obvious difference between the bars.



Communicate About Conclusions from Data Displays

Goal Use data presented in tables, charts, and graphs to create an argument.

1. A newspaper printed this scatter plot with the headline “Drinking More Water Means Fewer Colds.”



Write a letter to the editor about the headline and the scatter plot. Use the Communication Checklist

At-Home Help

To determine if a conclusion drawn about a table, chart, or graph is true

- carefully check the scale and intervals on the graph
- look at what types of data are being compared, for example, temperature compared to time
- ask yourself if there is a clear relationship between the types of data

For example, comparing the heights of Grade 6 students to the distance they walk to school makes no sense. Comparing the heights of Grade 6 students to the length of one stride makes sense.

When creating an argument, use the Communication Checklist to help you state your observations and conclusions.

Communication Checklist

- Did you explain your thinking?
- Did you include enough detail?
- Did you use correct math language?
- Does your argument make sense?