Name:

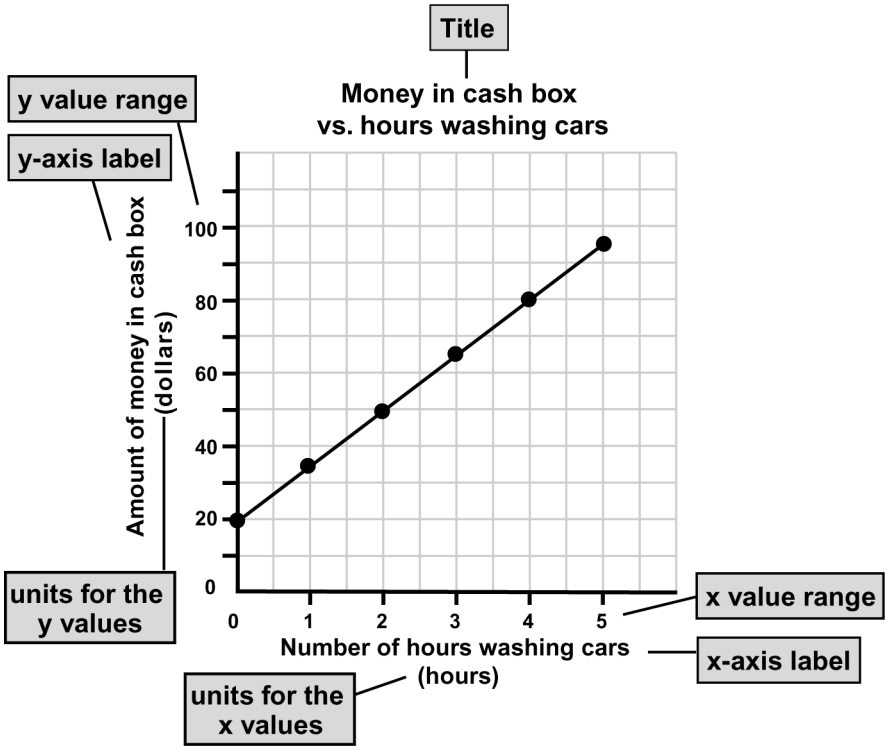
Skill Builder — Making Graphs

This skill sheet will help you master graphing skills. There are three main kinds of graphs: line graphs, bar graphs, and pie graphs. On this skill sheet, we will focus on line graphs. Line graphs represent data as a series of points. A line is drawn through the points to show the pattern made by the points.

1. The parts of a graph

A graph is a picture of information. The labels on a graph provide important information. The diagram below shows the labels you should put on a graph and how these labels should look.

When you are plotting your data on a graph, be sure to use all of the available space. Avoid plotting all your data in one corner of the graph.



2. Data sets

Table 1 and 2 below each contain a data set. A data set is organized into pairs of values. For every value in the "x" column, there is a value in the "y" column. Each pair of values can be represented by writing (x, y).

A pair of values (x,y) represents a certain location or point on a graph. The x and y values are the *coordinates* of the point. A graph of a data set represents a "picture" of the points.

Fill in the third column of each data set by writing the pairs of x and y values. The first row in each data table has been done for you.

Table 1: A car wash is being held to raise money for a school trip. The data set shows the relationship between the amount of money in the cash box and the number of hours spent washing cars. Why is \$20 in the cash box at the beginning of the car wash?

Table 1: Money in cash box vs. number of hours washing cars

Number of hours washing cars (hours) x	Amount of money in cash box (\$) y	Coordinates (x,y)
0	20	(0,20)
1	35	
2	50	
3	65	
4	80	
5	95	

Table 2: If you could measure how much water gets splashed out of a swimming pool as the number of people in the pool increases, the data might look like the data in Table 2.

Table 2: Number of people in a swimming pool vs. amount of water splashed out of the pool

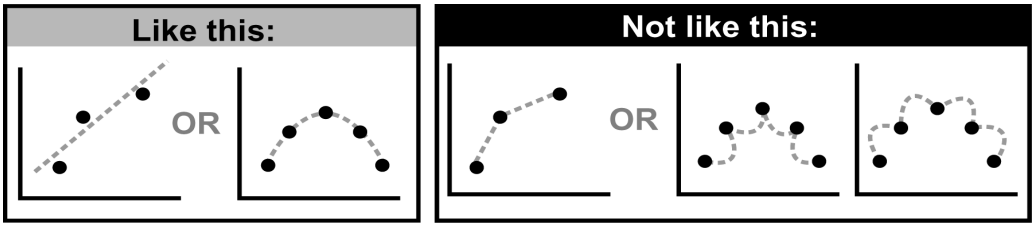
Number of people in a swimming pool x	Amount of water splashed out of the pool (gallons) y	Coordinates (x,y)
0	0	(0,0)
1	1	
2	4	
3	9	
4	16	
5	25	
6	36	

3. Making graphs from data sets

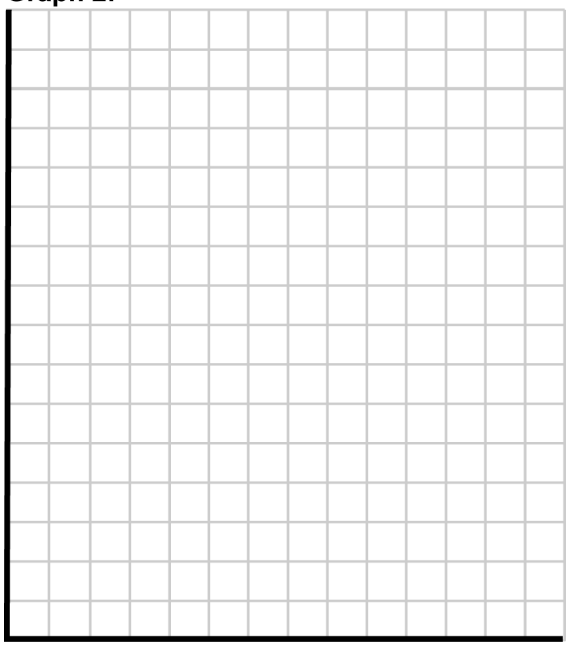
Now, make a graph of each data set. Use the data in Table 1 to make Graph 1, and the data in Table 2 to make Graph 2. The labels for Graph 1 have been added for you. You will need to add labels, including the title of the graph, to Graph 2.

Steps for making a graph:

- Label the graph with the titles from the headers of the data tables. The *y*-value header comes first in the title.
- Label the horizontal axis (the *x*-axis) with the label from the header for the "*x*" column. Label the vertical axis (the *y*-axis) with the label from the header for the "*y*" column.
- Decide what value each box on each axis will represent. Base your decision on the range of numbers for the *x* values and the *y* values. When the data is plotted on Graph 1 and Graph 2, the data points should spread out over the entire graph rather than cluster in a corner of the graph. Example: The range of numbers for the *x* values for Graph 1 is 0 to 5. There are 12 boxes on the *x*-axis of Graph 1. To spread out the points along this axis, each box represents 0.5 or every two boxes represents 1.
- Plot the *coordinates* (the pairs of *x*- and *y*-values). Each coordinate represents a point.
- Draw a line through the points to represent the pattern (or trend) that you see. Do not connect the points "dot-to-dot." See the examples below:



Graph 2:



4. Interpreting graphs

1. Write a short description of each graph. Describe the shape of each graph as if you were explaining them to someone who hasn't seen the graphs. How are Graph 1 and Graph 2 alike? How are they different?

2. Write one conclusion you based on the data in Graph 1. For example, what can you conclude about the relationship between the number of hours spent washing cars and the amount of money in the cash box?

3. Write one conclusion based on the data in Graph 2. For example, what do you conclude about the relationship between the number of people in a swimming pool and the amount of water splashed out of the pool?

5. Challenge questions

1. If you were looking at a graph with the title, *Distance walked versus time*, would the graph look more like Graph 1 or Graph 2?

2. If you were looking at a graph with the title, *Number of bacteria in a Petri dish versus time*, would the graph look more like Graph 1 or Graph 2? To answer this question, think about how populations of organisms increase in number.