A Graph is Worth a 1000 Words

Summary

Data is a collection of facts, such as values or measurements. It can be numbers, words, measurements, observations, or descriptions of things – any kind of information. We usually encounter data that is expressed as a set of numbers. It's collected in many ways, then organized so that people can make observations about the outcomes.

We usually don't need to know how the data we're working with was collected – if that's important information, it will be provided. However, how data is displayed and interpreted is very important! Once data is collected, it can be displayed in a number of ways. One useful format is a table, another is in a graph, such as a circle, bar, or line graph. You've probably seen examples of all of these; they show up in newspapers and in news casts on television.

There are times when it's very useful to be able to find one value that describes a whole set of data and there are a number of ways to determine that single value. Two common ones are: the **mean** and the **mode**. They are values that define the "center" of a set of data or what is typical of the whole set of data. Knowing how to calculate a single value that describes a whole set of data is important!

Workplace Readiness Skill

Mathematics: Uses mathematical reasoning to accomplish tasks.

Workplace Readiness Definition

- using mathematical reasoning and processes to accomplish job-specific tasks (e.g., using graphs and charts to estimate expenditures for a construction job, using decimals and percentages in retail applications)

- making calculations related to personal finance (e.g., wage rates, paycheck deductions, taxes)

Vocabulary

Pie Graph	Mean	Table
Bar Graph	Mode	Data
Line Graph		

Context Questions

- Have you ever had to do any calculations with decimals?
- Can you think of some instances when you used decimals?
- Why is important to understand decimals as they relate to money?

Guidelines

1. Prerequisite Knowledge/Skills
   You should be able to:
   - Add, subtract, multiply, and divide using decimals
   - Add, subtract, multiply, and divide using percents
   - Add, subtract, multiply, and divide using whole numbers

- Define mean, median, and mode
2. Complete the *A Graph is Worth a 1000 Words* exercise.

Evaluation

Check your work by referring to the *Dollars and Cents - KEY*.

Reflection after Completion

- Did you solve all or most of the problems correctly?
- Which ones were the most difficult for you?
- Were you able to apply the technique for solving word problems?
- What are the benefits of knowing how to interpret graphs and data?
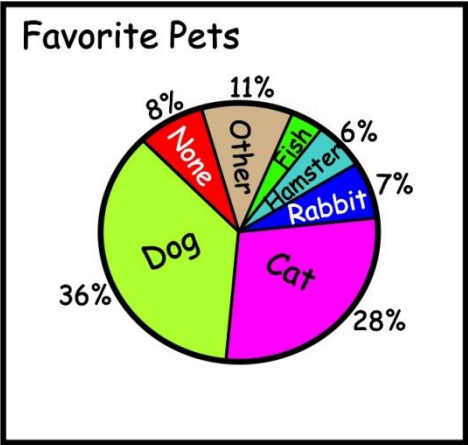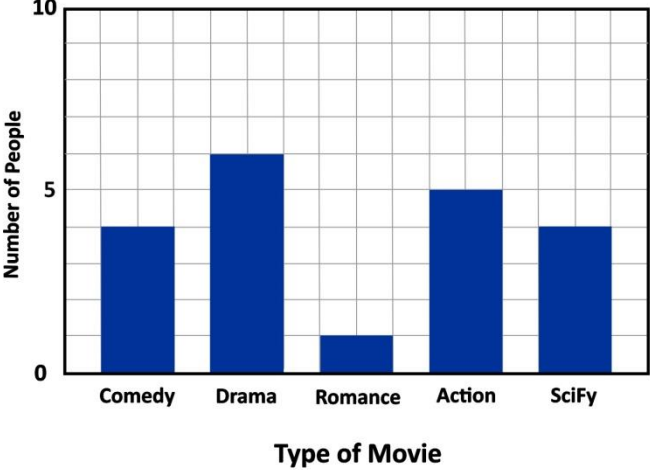
Resources:

If you need a review or more practice, go to:

http://www.mathsisfun.com/data/data-graph.php

http://www.mathsisfun.com/data/data.html

http://www.mathsisfun.com/mean.html

http://www.mathsisfun.com/mode.html

A Graph is Worth a 1000 Words

Using information from a graph.	
Item #	**Item**
1.	Anna did a survey at her school where she asked each child in the school to name their favorite type of pet. Anna decided to present the results in a pie graph. If there were 800 children in the school, how many said that their favorite pet was fish?
2.	Bob surveyed a group of his friends on their favorite type of movie and displayed the data on a bar graph. You can see which type of movie is the most liked or the least liked at a glance. We see, for example, that the least favorite are romances. Use the graph to answer these two questions: A. How many people say that their favorite type of movie is SciFy? B. What is the mode of the distribution? (*Remember that the mode is value or category that appears most often in a set of data.*)

3. The population of a town was recorded every twenty years from 1900 to 2000. The results are shown in the line graph below. Use the graph to answer these three questions:

A. What was the population of the town in the year 1900?

B. How much did the population increase between 1960 and 1980?

C. Assuming the trend in the population growth continues, what will be the population in 2020?
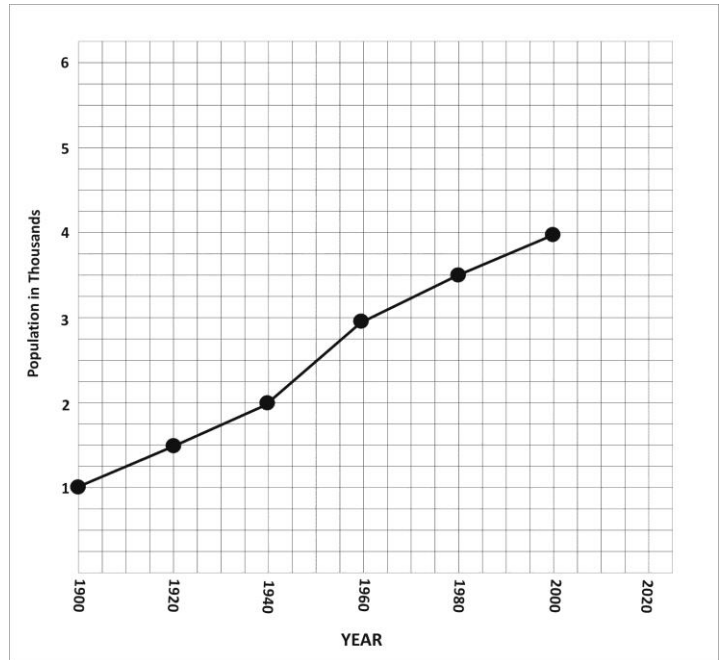
4. This table shows some data that scientists have collected about our solar system.

| Planet	Mass (in relation to Earth)	Distance from the Sun (in AU)
Mercury	0.4	0.06
Venus	0.7	0.8
Earth	1	1
Mars	0.1	1.5
Jupiter	318	5.2
Saturn	95	9.5
Neptune	14	19.2
Uranus	17	30.0

Which conclusion does the data support?

A. Three planets in the solar system have less mass than Earth.

B. Earth is the only planet on which people can live.

C. Some planets in the solar system are more than 500 AUs from the sun.

5.	The Maple Avenue Diner does a great business at lunch time. The owner graphed the breakdown of the percentage of sales of each type of item on the menu. Using the pie chart, answer the following questions:

A. If 15% of the sales were desserts, how much of the lunch sales were for desserts?

Lunch Sales
Daily Total = $2,000

(pie chart: Desserts, Sandwiches, Beverages, Soup, Salads)

B. Which of the following percentage is the best estimate of sandwich sales?

    a. 15%

    b. 21%

    c. 40%

    d. 65%
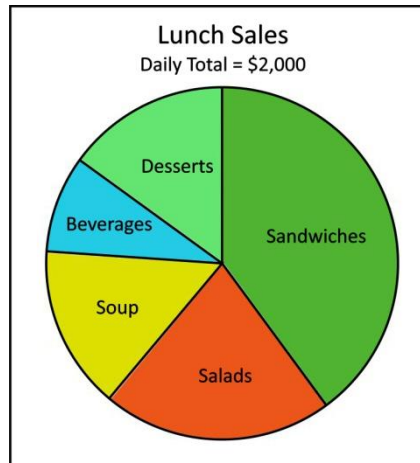
6.	Your boss asked you to create a bar chart of the total sales of loaves of bread in the bakery by month for the last January through June. After she looked at your chart, she asked, "What is the mean number of loaves that we've sold during this period of time?"

Bread Sales

(bar chart: Number of Loaves vs Month — January, February, March, April, May, June)

Vocabulary for *A Graph is Worth a 1000 Words*

Term	Definition
Data	Information; facts, figures, statistics
Pie Graph	A circular graph that shows how a set of data is divided proportionately
Bar Graph	A graph that uses horizontal or vertical bars to display data
Line Graph	A graph that uses line segments to show changes that occur over time
Table	A set of data arranged in a grid of rows and columns
Mean	A measure of center in a set of numerical data, computed by adding the values in a list and then dividing by the number of values in the list.
Mode	The value that occurs most frequently in a given data set.