Math Virtual Learning

Algebra IIB

The Data Unit - Introduction to Data

April 23, 2020

Algebra IIB
Lesson: April 23, 2020

Objective/Learning Target: Students will make a graph using categorical data

Let's Get Started:

In this unit we will explore data and learn methods to make sense of it. One of the easiest ways to make meaning of data is to organize it into a graph. There are many types of graphs and each has its strengths and weaknesses. Graphs can be grouped into 2 categories: Categorical Graphs and Numerical/Quantitative Graphs.

Categorical Data - Data that can be sorted into groups and then counted, for example: gender, grade level, color, state lived in … You can identify categorical data by seeing if the order of the categories makes a difference. For instance, if I am looking at the colors of M&Ms, there is not a specific "starting" color.

Numerical/Quantitative Data - Numerical data is data that is measurable, such as time, height, weight, amount, and so on. You can help yourself identify numerical data by seeing if you can average or order the data in either ascending or descending order.

Examples of Categorical Graphs
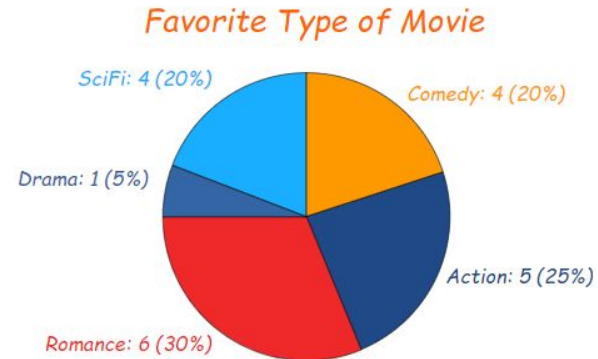
Bar Charts
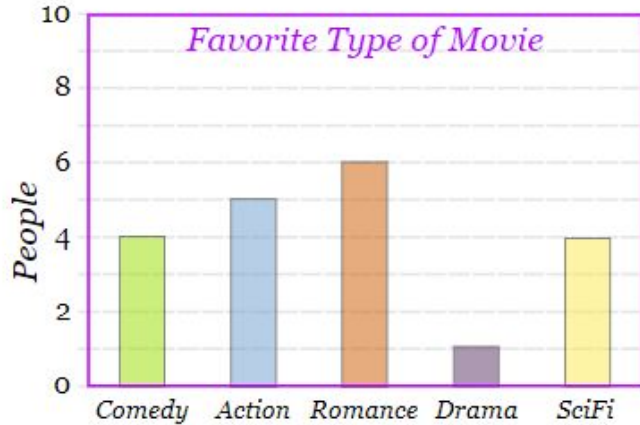
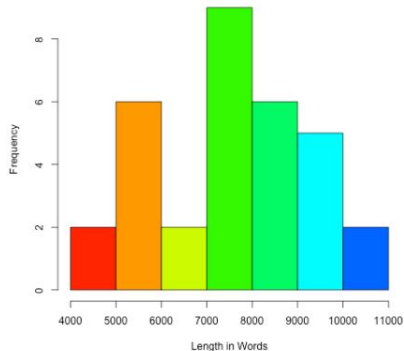
Circle Graphs

Table: Favorite Type of Movie

Comedy	Action	Romance	Drama	SciFi
4	5	6	1	4

Both charts are based on the table of data. Note that the **order** of the categories does not matter.
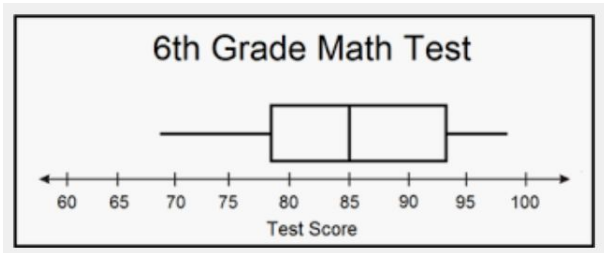
Examples of Numerical/Quantitative Graphs

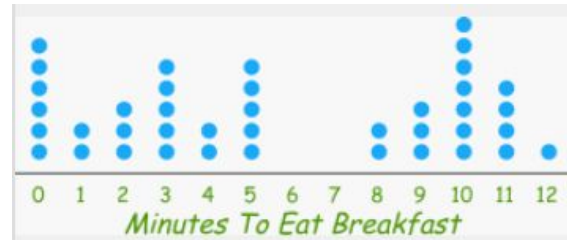**HISTOGRAM**
Length of Greek Tragedies in Words

BOX PLOT
6th Grade Math Test

60 65 70 75 80 85 90 95 100
Test Score

DOT PLOT

0 1 2 3 4 5 6 7 8 9 10 11 12
Minutes To Eat Breakfast

STEM-AND-LEAF PLOT
Race Running Times in Seconds

Stem	Leaves
12	2 6
13	0 2 5
14	1 2 4 6
15	2 3 7 8
16	1 2 4 6 8
17	5 7 8
18	1 3

Key: 14 | 2 = 14.2 seconds

All of the data on these types of graphs can be **ORDERED**. Because of the order, there is a SHAPE to the data, a **CENTER** to the data and a visible **SPREAD** of the data. We can also easily see any unusual data **(OUTLIERS).**

Categorical Data - Bar Graphs

The data in a bar graph usually just gives counts of the data. This is the most basic graph and the easiest to read. The bars do not touch. The bars can be either horizontal or vertical.

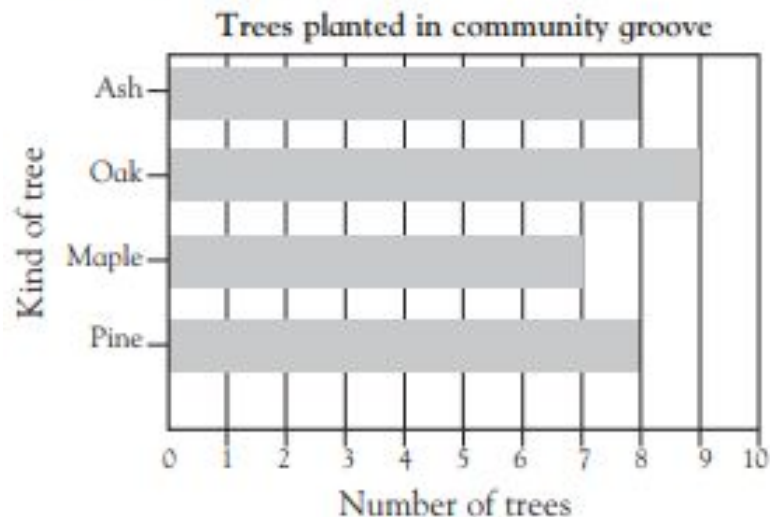Look at this graph.

Trees planted in community grove
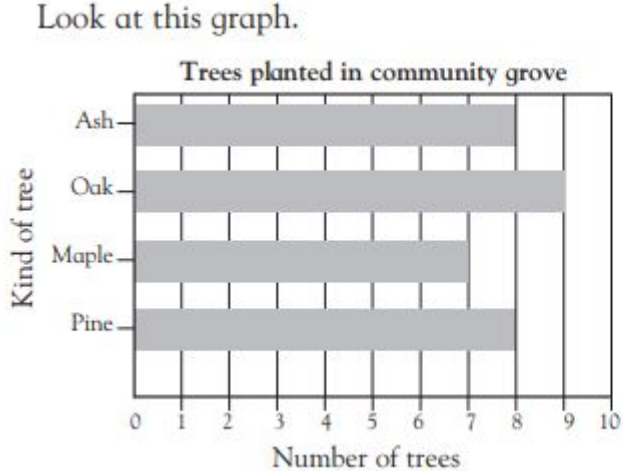
How many maple trees were planted?

The same number of ash trees were planted as what other kind of tree?

How many more oak trees were planted than maple trees?

Answer

Look at this graph.

Trees planted in community groove

Kind of tree: Ash, Oak, Maple, Pine
Number of trees: 0 1 2 3 4 5 6 7 8 9 10

How many maple trees were planted?

7 maple trees

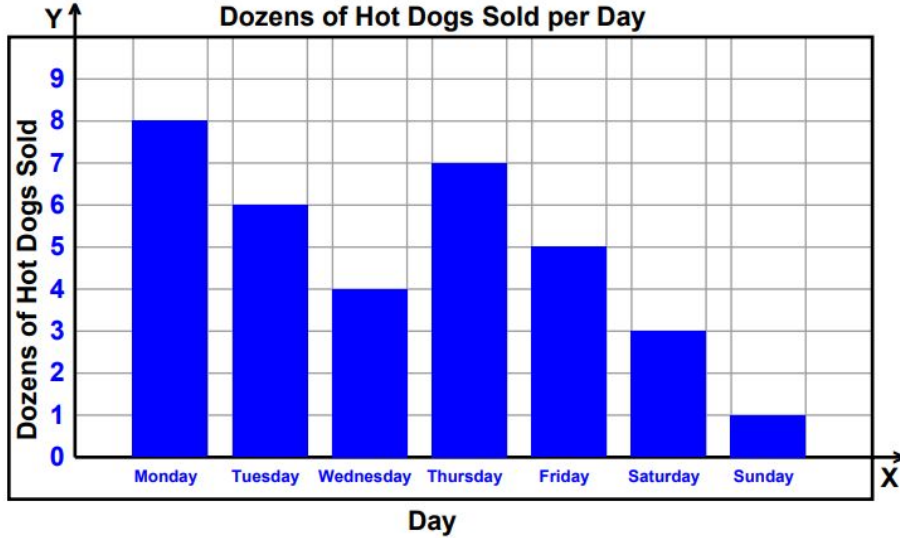The same number of ash trees were planted as what other kind of tree?

Pine

How many more oak trees were planted than maple trees?

2

Reading Bar Graphs

Answer the following questions based off the bar graph.

Dozens of Hot Dogs Sold per Day

How many hot dogs were sold on Tuesday and Saturday combined? _____

How many more hot dogs were sold on Monday than on Sunday?

_____

How many hot dogs were sold on Monday, Wednesday, and Sunday? _____

Next week, we hope to sell twice as many hot dogs as we did this week. How many hot dogs will that be? _____

Were more hot dogs sold on Monday or on Thursday?

_____

Answer

How many hot dogs were sold on Tuesday and Saturday combined?

108

How many more hot dogs were sold on Monday than on Sunday?

84

How many hot dogs were sold on Monday, Wednesday, and Sunday?

156

Next week, we hope to sell twice as many hot dogs as we did this week. How many hot dogs will that be?

816

Were more hot dogs sold on Monday or on Thursday?

Monday

Categorical Data - Circle Graphs

The data in a circle graph gives a PROPORTIONAL representation of the data. It can be expressed as counts or as percentages. From the graph below it is easy to see that over half of the students walk or ride in a car to school. But what percent of students walk or ride in a car?

Methods of Travelling to School

- ■ Walking
- ■ Car
- ■ Bus
- ■ Cycle
- ■ Train
- ■ Taxi
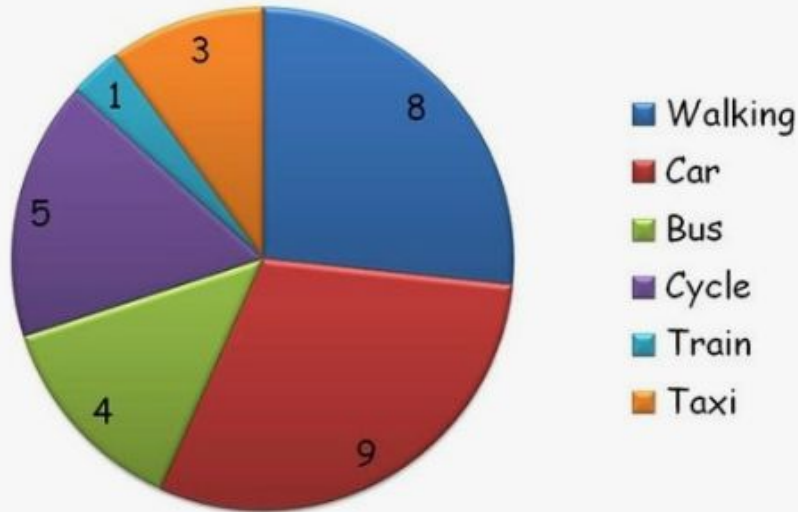
To figure out a percent:
1. Find the total number of students polled by adding up the numbers on the graph.
   30
2. Divide the category you are interested in by the total:
   Walking: 8/30=0.267 which is approximately 26.7%.
3. Car: 9/30=0.3 which is exactly 30%.

Circle Graphs - Continued

One of the strengths of a Pie Chart/Circle Graph is is easily lets you compare one category to the whole data set. One of its weaknesses is that it is very difficult to create an accurate one by hand. Using technology is the best way of creating a circle graph. Go to https://www.mathsisfun.com/data/data-graph.php to create a Circle Graph for the following data:

Kevin's mom observed his activity for a day. She recorded the data in a table.
Use this information and construct a pie graph.

Activity	Hours	Percent
School	6	
Meal	2	
Sleep	8	
Sports	3	
Homework	2	
Leisure time	3	
Total	24	

Practice Problem: Circle Graph

300 students were recently polled about their favorite type of candy bar given 6 options. The data is represented in the circle graph to the right.

1.   What percent of students prefer Snickers or Twix?

2.   What percent of students do NOT prefer Reese's Peanut Butter Cups?

3.   How many students prefer Milky Way?

4.   How many more students prefer Butterfinger to Twix?
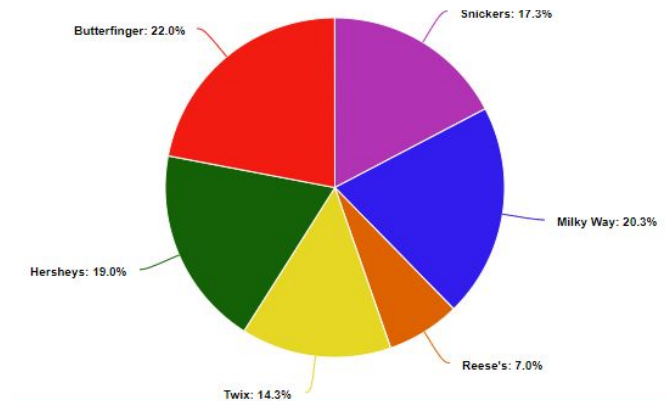
Practice Problem: Circle Graph Answer Key

300 students were recently polled about their favorite type of candy bar given 6 options. The data is represented in the circle graph to the right.

1. What percent of students prefer Snickers or Twix?

    17.3% + 14.3% = 31.6%

2. What percent of students do NOT prefer Reese's Peanut Butter Cups?

    100% - 7% = 93%

3. How many students prefer Milky Way?

    20.3% ------->   0.203 * 300 = 61 Students

4. How many more students prefer Butterfinger to Twix?

    Butterfinger = 22% ---------> 0.22 * 300 = 66 Students

    Twix = 14.3%   ---------> 0.143 * 300 = 43 Students

    66 - 43 = 23 more students prefer Butterfinger than prefer Twix

Butterfinger: 22.0%
Snickers: 17.3%
Milky Way: 20.3%
Hersheys: 19.0%
Reese's: 7.0%
Twix: 14.3%