Activity Page: Seven Friends

Seven friends each have a package of colored chocolate candies. Some of the packages are the fun size and some of the packages are the regular size. The chart below shows how many individual colored chocolate candies each person has in his or her package.

Friend's Name	Number of Colored Chocolate Candies
Miriam	24
Martha	18
Mark	38
Maria	24
Melissa	32
Michael	36
Melinda	24

1. What was the most common number of candies in a bag?

2. If the bags of candy were arranged in order from the least number of candies in a bag to the greatest number of candies in a bag, which bag would be located in the exact center? How many candies would be in this bag?

3. Who has the greatest number of candies? How many does he/she have?

4. Who has the least number of candies? How many does he/she have?

5. How many more candies does the person with the most have than the person with the least?

6. If the candies were redistributed so each person has the same amount, how many would each person have?

7. Open the **Seven Friends spreadsheet** and complete the activities on **sheet 1**.

Activity Page: How Far Can We Stretch?

1. Record the names of all of the students in your group in the chart below. Then measure across each person's back the length of how far each person can stretch. Measure from fingertip to fingertip the length in inches of each member of your group (round to the nearest inch) and record each length in the table.

Student Name	Height in Inches

2. When your group has measured and recorded the length of each person's stretch in the group, transfer the information to the chart on the overhead.

3. Record the class data on the last page of this activity.

4. Create a stem and leaf plot to display the lengths of how far the students in your class can stretch.

5. Create a line plot to display the lengths of how far the students in your class can stretch.

6. What are the similarities and differences in the two plots? Can you tell more about the data in one of the plots than the other? If so, which plot displays the data better? If you had to pick only one plot to display the data which one would you choose and why?

7. What is the mean of the data? Justify your answer.

8. What is the mode of the data? Justify your answer.

9. What is the median of the data? Justify your answer.

10. What is the range of the data? Justify your answer.

11. Use the Stem and Leaf Plotter to verify your stem and leaf plot.
    http://www.shodor.org/interactivate/activities/stemleaf/index.html

12. Use the Line Plotter to verify your line plot.
    http://www.shodor.org/interactivate/activities/plop/index.html

13. Use formulas in a spreadsheet to verify your answers for mean, median, mode, and
    range.

14. Which method (paper and pencil or website) was easier to use to construct the
    Stem and Leaf Plot and Line Plot?

15. How is calculating the mean, median, mode, and range from the spreadsheet
    different from calculating the statistics by hand? How is it the same?

16. Which method (paper and pencil or spreadsheet) was easier to use to calculate the
    mean, median, mode, and range? Why?

Activity Page: What is Missing?

There are nine sixth grade classes at Texas Middle School. Mary knows the number of students in six of the classes. The data she knows appears in the table below.

Class A	22 students	Class F	24 students
Class B	25 students	Class G	?
Class C	23 students	Class H	?
Class D	22 students	Class I	?
Class E	24 students		

She knows that the largest class has twenty-five students. She also knows the information listed below.

The mean is 23 students.
The mode is 24 students.
The median is 23 students.
The range is 5 students.

How many students are in each of the three missing classes?

Use the websites and a spreadsheet to help find the number of students in the three missing classes.

http://www.shodor.org/interactivate/activities/stemleaf/index.html

http://www.shodor.org/interactivate/activities/plop/index.html

1   Which of the following is the data set represented in the stem and leaf plot shown below?

5	6 8 9
6	1 3 4 5
7	0

A   0, 1, 3, 4, 5, 6, 7, 8, 9

B   50, 60, 70

C   5689, 61345, 70

D   56, 58, 59, 61, 63, 64, 65, 70

2   The range in weight of several boxes in a warehouse is 25 pounds. If the greatest weight of a box is 78 pounds, how much does the lightest box weigh?
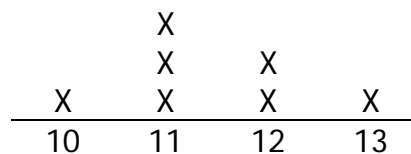
A   25 pounds

B   53 pounds

C   103 pounds

D   128 pounds

3   Andrew kept a record of his bowling scores. The scores are shown in the table below.

Game	Score
1	150
2	140
3	170
4	200
5	140

What is the mean of his scores?

A   160

B   140

C   200

D   170

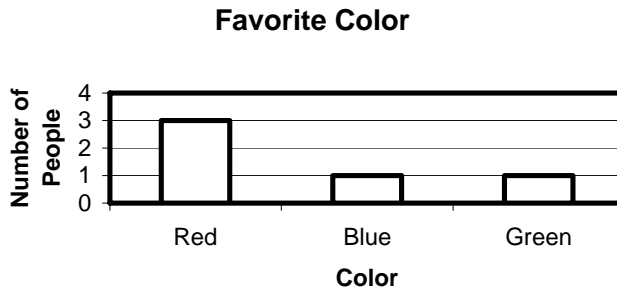**4**   The line plot shows the ages of the grandchildren in a large family.

```
                  X
                  X         X
        X         X         X         X
      ─────────────────────────────────────
        10        11        12        13
```

Which statement does the information in the line plot support?

A   There are just as many grandchildren that are 11 years old as grandchildren that are 12 years old.

B   There are six grandchildren that are 11 years old or older.

C   There are more grandchildren that are 11 years old than grandchildren that are 12 years old or 13 years old.

D   There are two grandchildren that are 12 years old or older.

Simple Probability, Bar and Circle Graphs Spreadsheet

What Color?

Mary conducted a survey to determine the favorite color of 5 students in her advisory class. The results are shown in the bar graph below.

Favorite Color

She then took a color tile and let it represent the color of each student's vote and put it in a bag.

1. How many color tiles of each color should she put in the bag? Justify your answer.

2. If Mary draws a color tile at random out of the bag, how likely is she to draw a red tile? Why?

3. If Mary draws a color tile at random out of the bag, how likely is she to draw a blue tile? Why?

4. If Mary draws a color tile at random out of the bag, how likely is she to draw a green tile? Why?

5. Sketch a circle graph to represent what part of the whole each color tile represents in the Favorite Color data.

6. Transfer your sketch onto a piece of chart paper.

7. Record on the chart paper: What are the similarities and differences in the circle graph you drew and the bar graph you were given?

(Continue: What Color?)

Mary wanted to conduct an experiment using the bag of tiles she created based on the information in the Favorite Color graph. She decided she would draw a tile out of the bag, record the color of the tile, return the tile to the bag, and draw again. She decided to repeat this process for 25 draws.

8. How many of the 25 draws should Mary expect to be red? Why?

9. How many of the 25 draws should Mary expect to be blue? Why?

10. How many of the 25 draws should Mary expect to be green? Why?

You will need to model the same experiment that Mary did.
- **Create a frequency table like the one below on the chart paper.**
- **Put a color tile for each student vote in the bag.**
- **Draw a color tile at random from the bag.**
- **Record the color of the tile on the chart paper and worksheet.**
- **Return the tile to the bag.**
- **Repeat this process 100 times.**

Color	Tally	Frequency
Red		
Blue		
Green		

The number of tiles you actually draw from the bag in an experiment is called the *Experimental Probability*.

11. What was your experimental probability of drawing a red?

12. What was your experimental probability of drawing a blue?

13. What was your experimental probability of drawing a green?

(Continue: What Color?)

14. How did the number of red tiles you drew compare to the number you said Mary should have drawn?

15. How did the number of blue tiles you drew compare to the number you said Mary should have drawn?

16. How did the number of green tiles you drew compare to the number you said Mary should have drawn?

17. How close was your prediction to the actual results?

Open the *What Color?* spreadsheet file.
- **Select *Sheet 1* and follow the directions to simulate the experiment.**
- **Select *Sheet 2* and follow the directions to create a circle graph.**

Color	Tally	Frequency
Red		
Blue		
Green		

The number of tiles of one color in the bag compared to total number of tiles in the bag is called the *Theoretical Probability* of selecting a tile of that color.

18. How close was your prediction to the actual results? (Record your response on the chart paper.)

19. What could you do to get your experimental probability to be closer to the theoretical probability? (Record your response on the chart paper.)

Simple Probability, Bar and Circle Graphs Spreadsheet

You Design It

Open a spreadsheet document. Use the spreadsheet to design a spinner that has each of the theoretical probabilities listed in the table.

P(Red) $= \dfrac{1}{3}$	
P(Blue) $= \dfrac{1}{4}$	
P(Green) $= \dfrac{1}{4}$	
P(Yellow) $= \dfrac{1}{6}$	

Explain how you designed your spinner.

1 Alan has 3 peppermint candies, 8 cinnamon candies, 4 root beer candies, and 6 butterscotch candies in a bag. If he draws a piece of candy at random from the bag, what is the probability he will draw a piece of butterscotch candy?

A $\dfrac{5}{7}$

B $\dfrac{3}{5}$

C $\dfrac{2}{5}$

D $\dfrac{2}{7}$

2 Mary has a quarter to buy a gumball from a machine. In the machine there are 3 red gumballs, 4 blue gumballs, 3 yellow gumballs, and 2 green gumballs. What is the probability that Mary will NOT get a yellow gumball when she puts her quarter in the machine to buy a gumball?

A $\dfrac{3}{4}$

B $\dfrac{2}{3}$

C $\dfrac{1}{3}$

D $\dfrac{1}{4}$

Simple Probability, Bar and Circle Graphs Spreadsheet

3 Alicia conducted a survey about the number of pets people owned. The results of the survey are shown in the table below.

Number of Pets

Number of Pets	People
1	50
2	100
3	25
4	25

A

Number of Pets

C

Number of Pets

B

Number of Pets
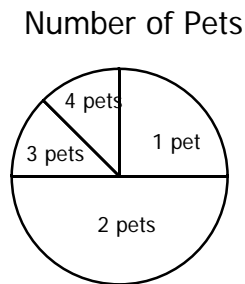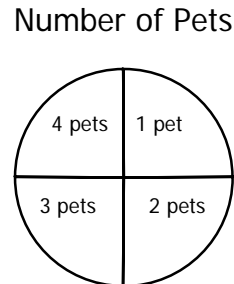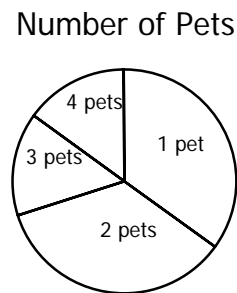
Number of Pets
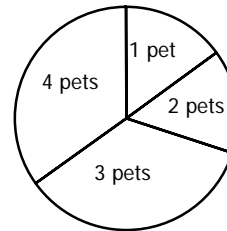
4 The circle graph shows the results of a survey about students' favorite sports.
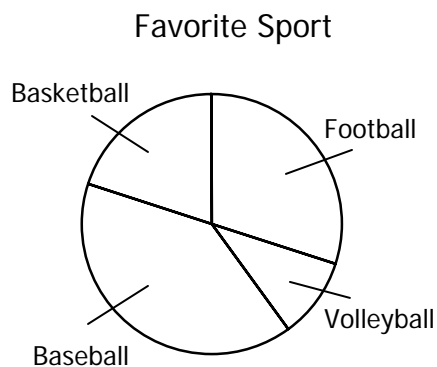
Favorite Sport

Which statement is supported by the information in the circle graph?

A   Football is the most popular sport.

B   More people said baseball was their favorite sport than basketball.

C   Basketball is the least favorite sport.

D   More people said basketball was their favorite sport than football.

What Color?

Part I.

Mary conducted a survey to determine the favorite color of 5 students in her advisory class. The results are shown in the bar graph below.

Favorite Color

She then took a color tile and let it represent the color of each student's vote and put it in a bag.

1. How many color tiles of each color should she put in the bag? Justify your answer.

2. If Mary draws a color tile at random out of the bag, how likely is she to draw a red tile? Why?

3. If Mary draws a color tile at random out of the bag, how likely is she to draw a blue tile? Why?

4. If Mary draws a color tile at random out of the bag, how likely is she to draw a green tile? Why?

5. Sketch a circle graph to represent what part of the whole each color tile represents in the Favorite Color data.

6. Transfer your sketch onto a piece of chart paper.

7. Record on the chart paper: What are the similarities and differences in the circle graph you drew and the bar graph you were given?

Part II.

Mary wanted to conduct an experiment using the bag of tiles she created based on the information in the Favorite Color graph. She decided she would draw a tile out of the bag, record the color of the tile, return the tile to the bag, and draw again. She decided to repeat this process for 25 draws.

1. How many of the 25 draws should Mary expect to be red? Why?

2. How many of the 25 draws should Mary expect to be blue? Why?

3. How many of the 25 draws should Mary expect to be green? Why?

The number of possible outcomes (how many tiles of a color) out of all possible outcomes (total number of tiles) is called the *Theoretical Probability*

Model the same experiment that Mary did using color tiles and a bag.
- **Create a frequency table like the one below on the chart paper**
- **Put a color tile for each student vote in the bag**
- **Draw a color tile at random from the bag**
- **Record the color of the tile on the chart paper and worksheet**
- **Return the tile to the bag**
- **Repeat this process 25 times**

Color	Tally	Frequency
Red		
Blue		
Green		

The number of tiles you actually draw from the bag in an experiment is called the *Experimental Probability*.

4. What was your experimental probability of drawing a red?, a blue?, a green?

5. How did the number of red tiles you drew compare to the number you said Mary should have drawn?

(Continue: What Color? – Part II.)

6. How did the number of blue tiles you drew compare to the number you said Mary should have drawn?

7. How did the number of green tiles you drew compare to the number you said Mary should have drawn?

8. How close was your prediction to the actual results?

9. What could you do to get your experimental probability to be closer to the theoretical probability?

10. Predict what would happen if you continued the experiment for 100 more draws.

11. Sketch a circle graph of the experimental data on the chart paper.

Part III.

Model Mary's experiment using the TI-73 calculator, and create a circle graph of the collected. Create a second frequency table like the one in Part I on the chart paper. Record the results on the chart paper and worksheet

By using the TI-73 calculator to simulate the experiment a large data set can be collected in a very short amount of time.

A. ON → APPS → (Prob Sim) → ENTER

B. 3 *(Pick Marbles)*
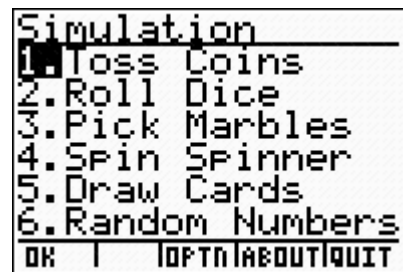
C. ZOOM *(Set for settings)*
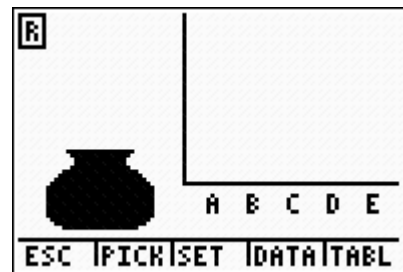
D. Under Settings, set up as illustrated.
    Trial Set: 1
    Types: 3
    Replace: Yes

(Continue: What Color? – Part III.)

E. WINDOW

Under # of marbles, set up colors as illustrated.

Red → Marble A: 3

Blue → Marble B: 1

Green →Marble C: 1

F. ENTER

G. TRACE

(this will simulate 50 trials)
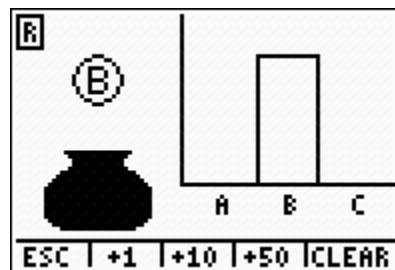
H. GRAPH

(this will show a table of the data generated)
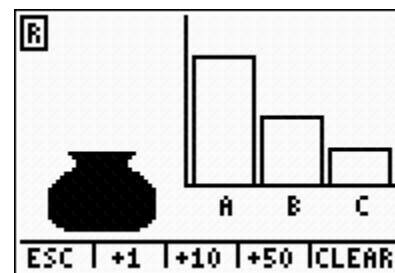
I. TRACE

Copy the data into the frequency table.

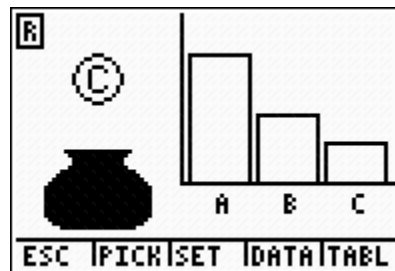*(Continue: What Color? – Part III.)*

    J. Sketch the graph on chart paper.

1. What was the experimental probability of drawing a red?, a blue?, a green?

2. Has the experimental probability moved closer to the theoretical probability? Justify your answer.

You Design It

Use a graphing calculator to design a spinner that has each of the theoretical probabilities listed in the table.

P(Red) $= \dfrac{1}{3}$	
P(Blue) $= \dfrac{1}{4}$	
P(Green) $= \dfrac{1}{4}$	
P(Yellow) $= \dfrac{1}{6}$	

Explain how you designed your spinner.

1 Alan has 3 peppermint candies, 8 cinnamon candies, 4 root beer candies, and 6 butterscotch candies in a bag. If he draws a piece of candy at random from the bag, what is the probability he will draw a piece of butterscotch candy?

A $\dfrac{5}{7}$

B $\dfrac{3}{5}$

C $\dfrac{2}{5}$

D $\dfrac{2}{7}$

2 Mary has a quarter to buy a gumball from a machine. In the machine there are 3 red gumballs, 4 blue gumballs, 3 yellow gumballs, and 2 green gumballs. What is the probability that Mary will NOT get a yellow gumball when she puts her quarter in the machine to buy a gumball?
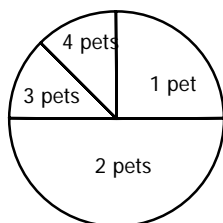
A $\dfrac{3}{4}$

B $\dfrac{2}{3}$

C $\dfrac{1}{3}$

D $\dfrac{1}{4}$

3   Alicia conducted a survey about the number of pets people owned. The results of the survey are shown in the table below.

Number of Pets

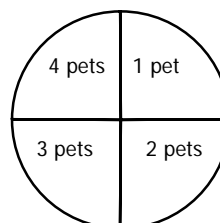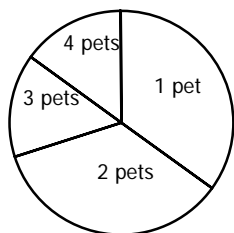| Number of Pets	People
1	50
2	100
3	25
4	25

A
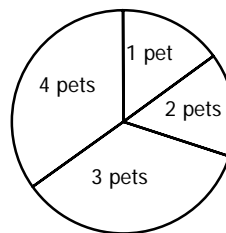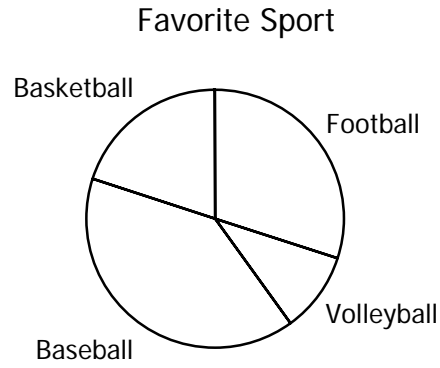
Number of Pets

C

Number of Pets

B

Number of Pets

Number of Pets

4   The circle graph shows the results of a survey about students' favorite sports. Which statement is supported by the information in the circle graph?

Favorite Sport

A   Football is the most popular sport.

B   More people said baseball was their favorite sport than basketball.

C   Basketball is the least favorite sport.

D   More people said basketball was their favorite sport than football.