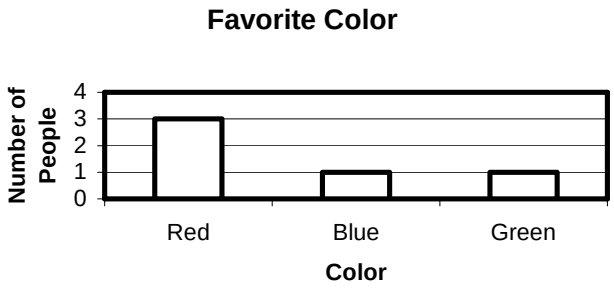
What Color?

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.



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.

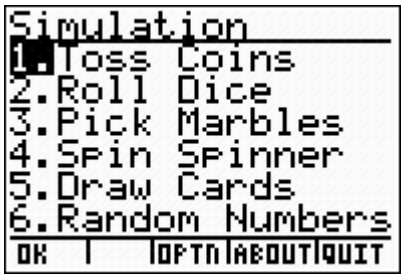
Part III.

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

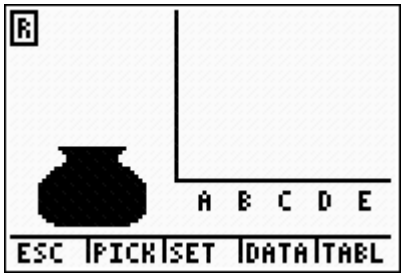
By using the TI-73 calculator to simulate the experiment a large data set can be collected in a very short amount of time.

A. [ON]→[APPS] → (Prob Sim)→[ENTER]

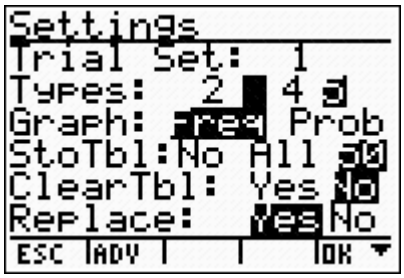
B. [3] *(Pick Marbles)*



C. [ZOOM] *(Set for settings)*



D. Under Settings, set up as illustrated.
Trial Set: 1
Types: 3
Replace: Yes



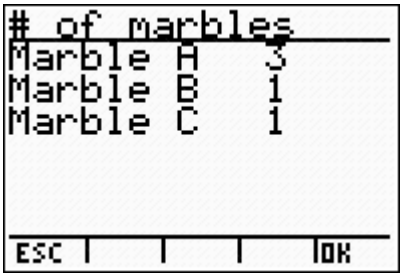
(Continue: What Color? – Part III.)

E. [WINDOW]
Under # of marbles, set up colors as illustrated.

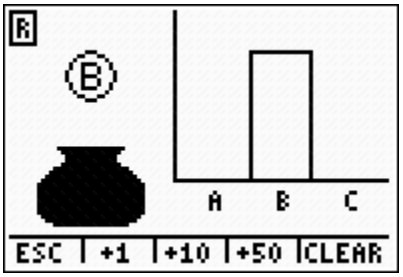
Red → Marble A: 3

Blue → Marble B: 1

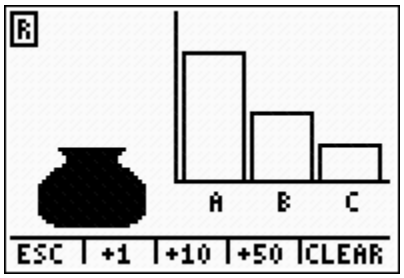
Green →Marble C: 1



F. [ENTER]



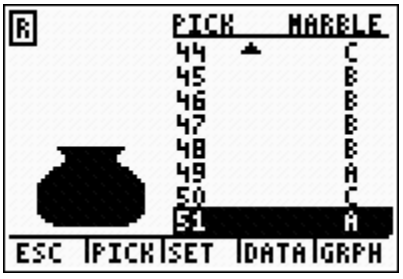
G. [TRACE]
(this will simulate 50 trials)



H. [GRAPH]
(this will show a table of the data generated)

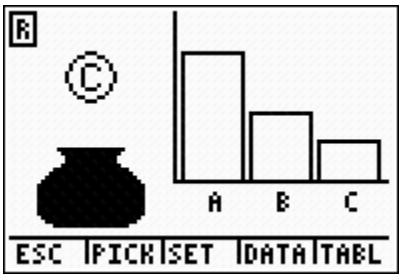
I. [TRACE]

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.

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

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 $\frac{5}{7}$

B $\frac{3}{5}$

C $\frac{2}{5}$

D $\frac{2}{7}$

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 $\frac{3}{4}$

B $\frac{2}{3}$

C $\frac{1}{3}$

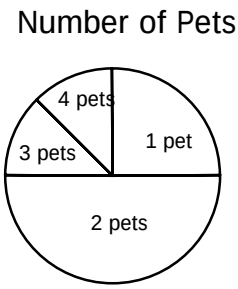
D $\frac{1}{4}$

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

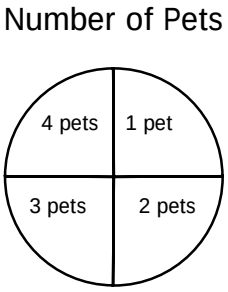
Number of Pets

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

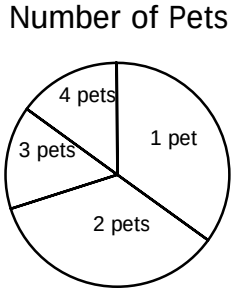
A

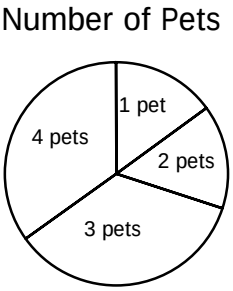


C

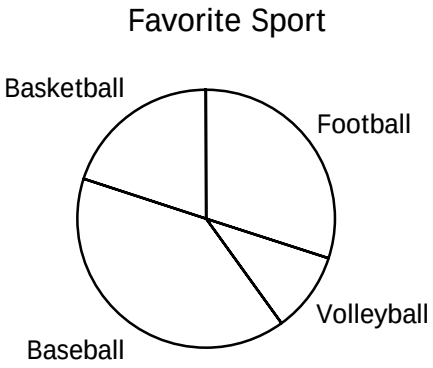


B





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?



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.