LESSON 10.3a
Toss the Cup

7.SP.6
7.SP.7b
7.RP.3

Objective Determining Experimental Probability of Simple Events

Warm-Up

Write each fraction as a percent.

1. $\frac{3}{10}$

2. $\frac{1}{4}$

3. $\frac{9}{20}$

4. $\frac{2}{5}$

GETTING STARTED

Flip It!

1. With a partner, flip a coin 30 times, record the results by copying the table below, and then calculate the probability of each event.

Outcome	Tally	Total	Probability
Heads			
Tails			

2. Combine the results of your experiment with those of your classmates. Then calculate the probability of each event.

3. What is the actual probability of flipping heads?

4. How does the actual probability compare to the calculated probability in Question 2?

EXPLORE 1

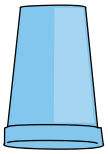
Determining Experimental Probability

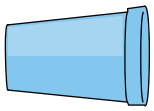
Two friends are designing a game called Toss the Cup.

The game is played between two players. To play the game, a paper or plastic cup is needed. To start the game, the paper cup is tossed in the air.

- If the cup lands on its bottom, Player 1 wins a point.
- If the cup lands on its top, Player 2 wins a point.
- If the cup lands on its side, neither player receives a point.

1. Predict the probability for each position in which the cup can land.





2. List the sample space for the game.

3. Can you use the sample space to determine the probability that the cup lands on its top, bottom, or side? Explain why or why not.

4. Do you think all the outcomes are equally likely?
Explain your reasoning.

5. Play the game 25 times with a partner. Decide who will be Player 1 and who will be Player 2.

a. Record your results in the table using tally marks. Then, write your and your opponent's total score, and write the number of times the cup landed on its side.

b. Summarize your results.

The theoretical probability of an event is the ratio of the number of desired outcomes to the total number of possible outcomes. This is the kind of probability you have been working with in previous lessons.

Experimental probability is the ratio of the number of times an event occurs to the total number of trials performed.

$$\text{Experimental Probability} = \frac{\text{number of times an odd can occurs}}{\text{total number of trials performed}}$$

6. What is the experimental probability of the cup landing:

a. on its bottom? b. on its top?

c. on its side?

7. Do you think this is a fair game to play? Why or why not?

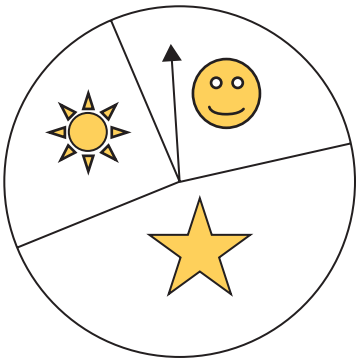
8. Is it possible to determine the exact probability of the cup landing on its top, bottom, or side? Explain your reasoning.

EXPLORE 2

Predicting Theoretical Probability Using Experimental Probability

Examine the spinner shown.

1. List the sample space.



2. Can you use the sample space to determine the probabilities of the spinner landing on each symbol? Explain why or why not.

3. On which symbol(s) does the spinner have the best chance of landing? On which symbol(s) does the spinner have the worst chance of landing?

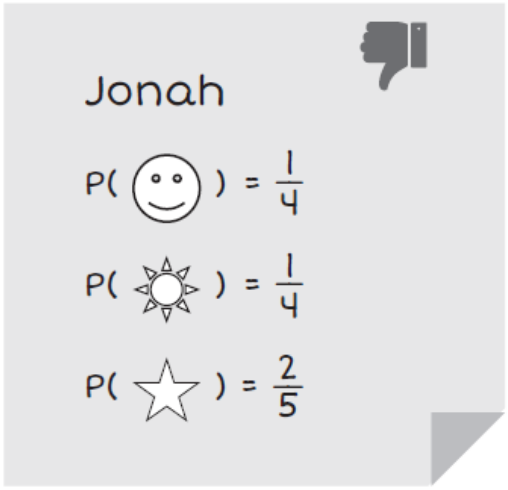
4. Predict the probability of the spinner landing on each symbol.

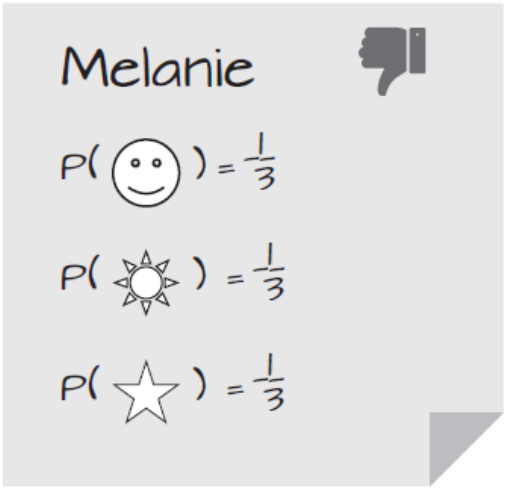
a. P() =

b. P() =

c. P() =

5. Jonah and Melanie make the following predictions for the spinner landing on each symbol. Explain why each student is incorrect.





6. Is there a way to determine the exact probabilities of landing on each of the shapes? Explain your reasoning.

Let's determine the experimental probability of the spinner landing on each of the symbols. Use a paper clip as the arrow part of the spinner. Place a pencil point through the paper clip, and then on the center of the circle. Working with a partner, one person will spin the spinner and the other person will record the result of each spin.

7. Spin the spinner 50 times and record the data using tally marks. Then, copy and complete the table.

Shape	Tally	Total	Probability
			
			
			

8. Calculate the experimental probabilities using your data.

a. P() =

b. P() =

c. P() =

9. Compare the experimental probabilities with your predictions from Question 4. What do you notice? Why did this happen?

Name: _____ Date: _____ Class: _____

Homework HW

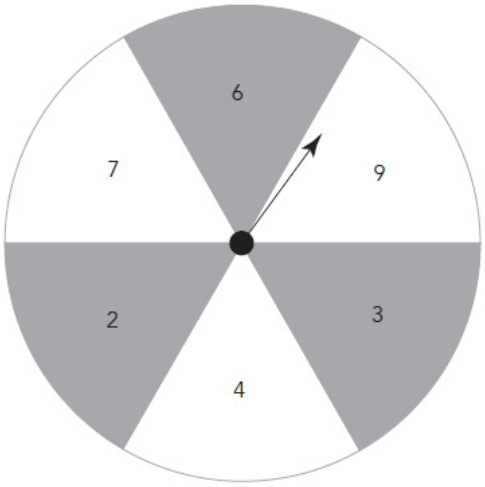
LESSON 10.3a
Toss the Cup

Objective

Determining Experimental Probability of Simple Events

Review

1. Charlie got a new board game that came with the spinner shown.



a. Complete the probability model for using this spinner.

Outcome	2	3	4	6	7	9
Probability						

b. What is the sum of the probabilities in the probability model?

c. What is the probability that Charlie spins the spinner and gets an even number?

2. Zoey is researching her smartphone data plan. She currently gets 2 gigabytes of data per month. She looks at her past usage and notices that she uses an average of 0.04 gigabytes of data per day.

a. Write an equation to represent the relationship between the number of days and the amount of data Zoey has left for the month.

b. Does she have enough data in her monthly plan for her average usage? Should she change plans?