10.3

Experimental & Theoretical Probability (Day 2)

Do Now

1. **You flip a coin 10 times and find the experimental probability of flipping tails to be 0.7. Does this seem reasonable? Explain.**

Learning Target:

- I can find relative frequencies.
- I can use experimental probabilities to make predictions.
- I can use theoretical probabilities to find quantities.
- I can compare experimental probabilities and theoretical probabilities.

When all possible outcomes are likely, the theoretical probability of an _____ is the _____ of the _____ of _____ _____ to the _____ of _____ _____. The theoretical probability of an event is written as P(event).

$$P(\text{event}) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

Experimental Probability

When you conduct an experiment, the relative frequency of an event is the _____ or _____ of the time that the event _____.

$$\text{relative frequency} = \frac{\text{number of times the event occurs}}{\text{total number of times you conduct the experiment}}$$

The experimental probability is based on the _____ _____ of an _____.

$$P(\text{event}) = \frac{\text{number of times the event occurs}}{\text{total number of trials}}$$

When you conduct an experiment, the **relative frequency** of an event is the fraction or percent of the time that the event occurs.

$$\text{relative frequency} = \frac{\text{number of times the event occurs}}{\text{total number of times you conduct the experiment}}$$

1 ACTIVITY: Finding Relative Frequencies

Work with a partner.

a. Flip a quarter 20 times and record your results. Then complete the table. Are the relative frequencies the same as the probability of flipping heads or tails? Explain.

	Flipping Heads	Flipping Tails
Relative Frequency		

b. Compare your results with those of other students in your class. Are the relative frequencies the same? If not, why do you think they differ?

c. Combine all of the results in your class. Then complete the table again. Did the relative frequencies change? What do you notice? Explain.

	Flipping Heads	**Flipping Tails**
Whole Class Relative Frequency		

d. Suppose everyone in your school conducts this experiment and you combine the results. How do you think the relative frequencies will change?

Finding Theoretical Probability

$$P(\text{event}) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

1) You randomly choose one of the letters shown.

   a) What is the theoretical probability of choosing a vowel?

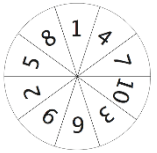
   b) What is the theoretical probability of choosing an X?

2) What is the experimental probability of rolling an even number?

Finding Theoretical Probability

$$P(\text{event}) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

2) The theoretical probability of spinning an odd number on a spinner is 0.6. The spinner has 10 sections. How many sections have odd numbers



Finding Theoretical Probability

$$P(\text{event}) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

3) The theoretical probability of winning a bobblehead when spinning a prize wheel is 1/6 . The wheel has 3 bobblehead sections. How many sections are on the wheel?