TOPIC 10

LESSON 10.2a

Give the Models a Chance

7.SP.7

Objective

Probability Models

Warm-Up

Determine each ratio.

1. number of heads to number of sides of coin

2. number of 6s to number of faces on a six-sided number cube.

Pocket Probabilities

Molly has 3 pennies, 4 nickels, 3 dimes, and 2 quarters in her pocket. She takes one coin out of her pocket and hides it in the palm of her hand. She wants her best friend to guess which coin she is holding.

1. Copy and complete the table. Use a fraction to represent each probability.

Outcome	Penny	Nickel	Dime	Quarter
Probability				

2. Determine the sum of the probabilities.

3. What coin would you advise Molly's best friend to guess?
Explain your reasoning.

EXPLORE 1

Using Probability Models

Jorge and Tristan are training to be magicians and are working on a card trick. They have 5 cards of different colors—red, blue, yellow, green, and purple. They are discussing the likelihood of an audience member picking each color, assuming that they can't see the card's color.

1. List the sample space for choosing a card.

2. What is the probability of selecting each card? Write the probability for each in the table.

Outcome	R	B	Y	G	P
Probability					

When solving a probability problem, it is helpful to construct a probability model. A probability model is a list of each possible outcome along with its probability. Probability models are often shown in a table. The probability model for choosing a card is shown.

A probability model will list all the outcomes which will be greater than 0, but less than 1. The sum of all the probabilities for the outcomes will always be 1.

3. Why is the sum of the probabilities in a probability model always 1?

4. Tristan claims, "The model is correct because the probabilities for all outcomes are equal to each other." Jorge disagrees and says, "The sum of all the probabilities is 1, but that does not mean the probabilities of all the outcomes are equal."

Who is correct? Explain your reasoning.

A uniform probability model occurs when all the probabilities in a probability model are equally likely to occur. Each color card in the magicians' trick had the same probability of being chosen.

When all probabilities in a probability model are not equal to each other, it is called a non-uniform probability model. An example would be a weather forecast that states there is a 30 percent chance of rain. That means there is a 70 percent chance of not raining. The sum of these two probabilities is 1, but the outcomes do not have the same probability.

Name: _____ Date: _____ Class: _____

Homework HW

LESSON 10.2a

Give the Models a Chance

Objective

Probability Models

Practice

There are twenty-five students in Mr. Gilbes' class, fourteen girls and eleven boys. Three of boys have no siblings, and eight of the boys have at least one sibling. Four of the girls have no siblings, and ten of the girls have at least one sibling. All of the students' names are written on equal-sized pieces of paper and placed in a bowl.

1. Doug Wilson is a student in this class, and he is the only person in the class with the first name Doug. What is the probability that Doug will be selected?

2. What is the probability that a girl will be selected?

3. What is the probability that a boy who has no siblings will be selected?

Review

1. A drawer contains 15 T-shirts. There are 4 blue, 9 green, and 2 black T-shirts. A T-shirt is grabbed at random from the drawer. Which statement(s) correctly describe the likelihood of an event?

Select True or False

a. It is unlikely that a black T-shirt will be selected.	True	False
b. It is certain that a green T-shirt will be selected.	True	False
c. It is impossible that a red T-shirt will be selected.	True	False
d. It is likely that a blue T-shirt will be selected.	True	False