

12.1

Sample Spaces and Probability

For use with Exploration 12.1

Essential Question How can you list the possible outcomes in the sample space of an experiment?

The **sample space** of an experiment is the set of all possible outcomes for that experiment.

1 EXPLORATION: Finding the Sample Space of an Experiment

Work with a partner. In an experiment, three coins are flipped. List the possible outcomes in the sample space of the experiment.



2 EXPLORATION: Finding the Sample Space of an Experiment

Work with a partner. List the possible outcomes in the sample space of the experiment.

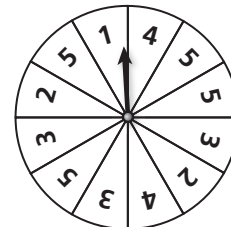
- a. One six-sided die is rolled.
- b. Two six-sided dice are rolled.



3 EXPLORATION: Finding the Sample Space of an Experiment

Work with a partner. In an experiment, a spinner is spun.

- a. How many ways can you spin a 1? 2? 3? 4? 5?

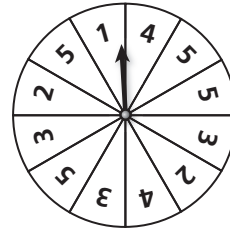


12.1 Sample Spaces and Probability (continued)

3 EXPLORATION: Finding the Sample Space of an Experiment (continued)

b. List the sample space.

c. What is the total number of outcomes?



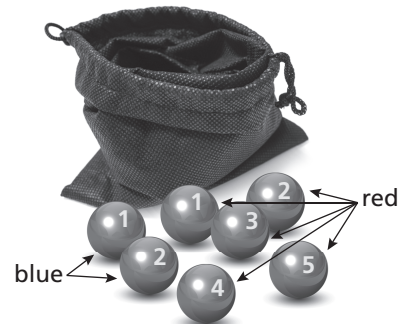
4 EXPLORATION: Finding the Sample Space of an Experiment

Work with a partner. In an experiment, a bag contains 2 blue marbles and 5 red marbles. Two marbles are drawn from the bag.

a. How many ways can you choose two blue? a red then blue? a blue then red? two red?

b. List the sample space.

c. What is the total number of outcomes?



Communicate Your Answer

5. How can you list the possible outcomes in the sample space of an experiment?

6. For Exploration 3, find the ratio of the number of each possible outcome to the total number of outcomes. Then find the sum of these ratios. Repeat for Exploration 4. What do you observe?

12.1**Notetaking with Vocabulary**

For use after Lesson 12.1

In your own words, write the meaning of each vocabulary term.

probability experiment

outcome

event

sample space

probability of an event

theoretical probability

geometric probability

experimental probability

Core Concepts**Probability of the Complement of an Event**

The probability of the complement of event A is

$$P(\overline{A}) = 1 - P(A).$$

Notes:

12.1 Notetaking with Vocabulary (continued)**Extra Practice**

In Exercises 1 and 2, find the number of possible outcomes in the sample space. Then list the possible outcomes.

1. A stack of cards contains the thirteen clubs from a standard deck of cards. You pick a card from the stack and flip two coins.
2. You spin a spinner with the numbers 1–5 on it and roll a die.
3. When two tiles with numbers between 1 and 10 are chosen from two different bags, there are 100 possible outcomes. Find the probability that (a) the sum of the two numbers is not 10 and (b) the product of the numbers is greater than 10.
4. At a school dance, the parents sell pizza slices. The table shows the number of pizza slices that are available. A student chooses a slice at random. What is the probability that the student chooses a thin crust slice with pepperoni?

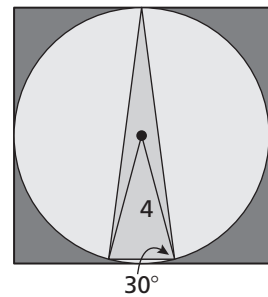
	Pepperoni	Plain Cheese
Thin Crust	34	36
Thick Crust	8	12

12.1 Notetaking with Vocabulary (continued)

5. Find the probability that the polynomial $x^2 - x - c$ can be factored if c is a randomly chosen integer from 1 to 12.

6. You throw a dart at the board shown. Your dart is equally likely to hit any point inside the square board.

a. What is the probability your dart lands in the smallest triangle?



b. What is the probability your dart does not land anywhere in the circle?

7. The sections of a spinner are numbered 1 through 12. Each section of the spinner has the same area. You spin the spinner 180 times. The table shows the results. For which number is the experimental probability of stopping on the number the same as the theoretical probability?

Spinner Results											
1	2	3	4	5	6	7	8	9	10	11	12
13	21	22	20	11	8	14	9	15	12	18	17