LESSON 11.1 **Study Guide**
For use with the lesson "Find Probabilities and Odds"

GOAL **Find sample spaces and probabilities.**

Vocabulary

A possible result of an experiment is an **outcome.**

An **event** is an outcome or a collection of outcomes, such as rolling an odd number.

The set of all possible outcomes is called a **sample space.**

The **probability of an event** is a measure of the likelihood, or chance, that the event will occur.
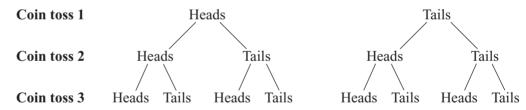
The **odds** of an event compare the number of favorable and unfavorable outcomes when all outcomes are equally likely.

EXAMPLE 1 **Find a sample space**

You toss 3 coins. How many possible outcomes are in the sample space? List the possible outcomes.

Solution

Use a tree diagram to find the outcomes in the sample space.

Coin toss 1	Heads		Tails	
Coin toss 2	Heads Tails		Heads Tails	
Coin toss 3	Heads Tails Heads Tails		Heads Tails Heads Tails	

The sample space has 8 possible outcomes. They are listed below. (Heads, H; Tails, T)

HHH, HHT, HTH, HTT, THH, THT, TTH, TTT

Exercise for Example 1

1. A spinner has 5 congruent spaces numbered 1 through 5. You spin the spinner and toss a coin. Find the number of possible outcomes. Then list the possible outcomes.

Study Guide *continued*
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EXAMPLE 2 ## Find a theoretical probability

A bag contains numbered balls in red, blue, and yellow. The table below shows the numbers of each type of ball. A ball is selected at random. What is the probability that the ball selected is an odd numbered yellow ball?

	Red	Blue	Yellow
Even numbered	6	8	10
Odd numbered	11	7	8

Solution

There is a total of $6 + 8 + 10 + 11 + 7 + 8 = 50$ balls. So, there are 50 possible outcomes. Of all the balls, 8 are odd numbered and yellow. There are 8 possible favorable outcomes.

$$P(\text{odd and yellow}) = \frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$$

$$= \frac{\text{Number of odd, yellow balls}}{\text{Total number of balls}}$$

$$= \frac{8}{50}$$

$$= \frac{4}{25}$$

Exercises for Example 2

In Exercises 2–4, use the table from Example 2 to find the probability.

2. What is the probability that a randomly chosen ball is even and red?

3. What is the probability that a randomly chosen ball is *not* odd and blue?

4. What is the probability that a randomly chosen ball is odd?