

# Section Overview

## Disjoint Events

Lesson 8-5

**Why?** Students can determine the probability that either of two mutually exclusive events will occur.

### Disjoint Events

Two events are disjoint if they cannot both occur in the same trial of an experiment.

#### Probability of Disjoint Events

probability of either event = probability of one event + probability of other event

$$P(A \text{ or } B) = P(A) + P(B)$$

#### Example

Find the probability of rolling 3 or 5 on a number cube.

$$\begin{aligned} P(3 \text{ or } 5) &= P(3) + P(5) \\ &= \frac{1}{6} + \frac{1}{6} = \frac{1}{3} \end{aligned}$$

## Independent and Dependent Events

Lesson 8-6

**Why?** Some events are influenced by what has happened before. You must determine whether two events are independent or dependent in order to find the probability of both events occurring.

### Independent Events

The occurrence of one event has no effect on the probability of the second event.

#### Probability of Independent Events

probability of both events = probability of first event · probability of second event

$$P(A \text{ and } B) = P(A) \cdot P(B)$$

#### Example

Find the probability of tossing heads on a coin and rolling 3 on a number cube.

$$\begin{aligned} P(\text{heads and } 3) &= P(\text{heads}) \cdot P(3) \\ &= \frac{1}{2} \cdot \frac{1}{6} = \frac{1}{12} \end{aligned}$$

### Dependent Events

The occurrence of one event does have an effect on the probability of the second event.

## Making Predictions

Lesson 8-7

**Why?** Probabilities can be used to make predictions about games, weather, and businesses.

If you roll a number cube 24 times, how many times can you expect to roll a 5?

$P(\text{rolling a } 5) = \frac{1}{6}$  Use the probability to set up a proportion.

$$\begin{aligned} \frac{1}{6} &= \frac{x}{24} \\ 6 \cdot x &= 1 \cdot 24 \\ 6x &= 24 \\ x &= 4 \end{aligned}$$

You can expect to roll a 5 four times in 24 rolls.