Lesson 9-7

Example 1 Experimental Probability
A number cube is rolled 80 times and a 3 results fifteen times. What is the experimental probability of rolling a 3?

$$P(3) = \frac{\text{number of times a 3 occurs}}{\text{number of possible outcomes}}$$
$$= \frac{15}{80} \text{ or } \frac{3}{16}$$

The experimental probability of rolling a 3 is $\frac{3}{16}$.

Example 2 Experimental and Theoretical Probability
When a coin was tossed 150 times, a tail resulted in 52 of the tosses. Find the experimental probability of tossing tails for this experiment?

$$P(\text{tails}) = \frac{\text{number of times tails occurs}}{\text{number of possible outcomes}}$$
$$= \frac{52}{150} \text{ or } \frac{26}{75}$$

The experimental probability of tossing tails is $\frac{26}{75}$.

Example 3 Experimental and Theoretical Probability
Compare the experimental probability you found in Example 2 to its theoretical probability.

The theoretical probability of tossing tails on a coin is $\frac{1}{2}$ or 50%. The experimental probability in Example 2 is $\frac{26}{75}$ or about 35%. The difference is quite large.

Example 4 Predict Future Events
WEATHER In a survey, 100 people were asked which is their favorite season of the year. Twenty-three responded winter, twenty-eight responded spring, thirty-two responded summer, and the remaining seventeen responded fall. What is the experimental probability of someone's favorite season being spring?

There were 100 people surveyed and 28 chose spring. So, the experimental probability is $\frac{28}{100}$ or $\frac{7}{25}$.

Example 5 Predict Future Events

Refer to Example 4. Suppose 400 people in a large corporation are asked which is their favorite season. How many can be expected to select spring?

$$\frac{7}{25} = \frac{x}{400}$$ Write a proportion.

$7 \cdot 400 = 25 \cdot x$ Find the cross products.

$2800 = 25x$ Multiply.

$112 = x$ Divide each side by 25.

About 112 will select spring as their favorite season.