LESSON 11-2

Experimental Probability

Lesson Objectives

Find experimental probability

Vocabulary

experimental probability (p. 632) _____

_____

Additional Examples

Example 1

During skating practice, Sasha landed 7 out of 12 jumps. What is the experimental probability that she will land her next jump?

$$P \approx \frac{\text{number of times an event occurs}}{\text{total number of trails}}$$

$$P(\text{land}) \approx \frac{\text{number of jumps } \square}{\text{number of jumps } \square}$$

$\approx \square$ Substitute.

The experimental probability that Sasha will land her next jump is $\square$.

Example 2

Students have checked out 55 books from the library. Of these, 32 books are fiction.

A. What is the experimental probability that the next book checked out will be fiction?

$$P(\text{fiction}) \approx \frac{\text{number of } \square \text{ books checked out}}{\text{total number of books checked out}}$$

$\approx \square$ Substitute.

The experimental probability that the next book checked out will be fiction is approximately $\square$.

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Reteach

Experimental Probability

Experimental probability is an estimate of the probability of an event. It is called *experimental* because you make observations or experiments to find the number of times a certain event actually happened.

$$\text{Experimental probability} \approx \frac{\text{number of times a certain event happened}}{\text{total number of trials}}$$

Suppose you have 12 marbles. Without replacing any marbles, you pull a red marble 5 times. What is the experimental probability of getting another red marble the next time you pull a marble?

$$P(\text{red}) \approx \frac{\text{number of red marbles}}{\text{number of marbles}} = \frac{5}{12}$$

The probability of getting red on the next pull is $\frac{5}{12}$.

At softball practice, Manny had 6 hits out of 15 times at bat.

1. What is the experimental probability that Manny will get a hit at his next time at bat?

   $P(\text{hit}) \approx \frac{\text{number of hits}}{\text{total number of times at bat}} = \frac{\quad}{\quad} = \frac{\quad}{\quad}$

2. What is the experimental probability that Manny will not get a hit at his next time at bat?

   $P(\text{no hit}) \approx 1 - \frac{\text{number of hits}}{\text{total number of times at bat}} = 1 - \frac{\quad}{\quad} = \frac{\quad}{\quad}$

Pam is playing darts. She hit the bull's eye 7 times out of 20 throws.

3. What is the experimental probability that Pam will hit the bull's eye on her next throw? _____

4. What is the experimental probability that Pam will NOT hit the bull's eye on her next throw? _____

So far this year Trisha's softball team has played 4 of their 20 games on Field A.

5. What is the experimental probability that they will play their next game on Field A? _____

6. What is the experimental probability that they will play their next game on a field other than Field A? _____

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Practice A

Experimental Probability

Find the experimental probability in the box. Each answer can be used only once.

$\frac{4}{11}$	$\frac{7}{9}$	$\frac{11}{15}$	$\frac{2}{9}$	$\frac{4}{15}$	$\frac{7}{11}$

1. Jolene is playing basketball. She scores on 11 out of the 15 baskets she shoots.

   a. What is the experimental probability that Jolene will get a basket on the next shot? _____

   b. What is the experimental probability that Jolene will not get a basket on the next shot? _____

2. Jamie is playing baseball. He gets a hit 7 out of 9 times at bat.

   a. What is the experimental probability that Jamie will get a hit his next time at bat? _____

   b. What is the experimental probability that Jamie will not get a hit his next time at bat? _____

3. Lou Ann is practicing for an archery tournament. She hits the target 7 out of 11 times.

   a. What is the experimental probability that Lou Ann will hit the target on the next shot? _____

   b. What is the experimental probability that Lou Ann will not hit the target on the next shot? _____

Find the experimental probability. Write your answer as a fraction, as a decimal, and as a percent.

4. A batter gets 6 hits in 12 times at bat. What is the experimental probability that she will get a hit in her next time at bat? _____

5. A goalie blocks 16 out of 20 shots. What is the experimental probability that he will block the next shot? _____

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Practice B

Experimental Probability

Find the experimental probability. Write your answer as a fraction, as a decimal, and as percent.

1. Jaclyn is a soccer goalie. If she has 21 out of 25 saves in practice, what is the experimental probability that she will have a save on the next shot on goal? _____

2. If Harris hit the bull's-eye 3 out of 8 times at archery practice, what is the experimental probability that he will hit the bull's-eye on his next try? _____

3. Nathan inspects new pants at a factory. Of the first 56 pairs of pants he inspected 49 were acceptable. What is the experimental probability that the next pairs of pants will be acceptable? _____

4. Sara has gone to work for 60 days. On 39 of those days she arrived at work before 8:30 A.M. On the rest of the days she arrived after 8:30 A.M. What is the experimental probability that she will arrive at work after 8:30 A.M. the next day she goes to work? _____

Solve:

5. After a movie premiere, 99 of the first 130 people surveyed said they liked the movie.

   a. What is the experimental probability that the next person surveyed will say he or she liked the movie? _____

   b. What is the experimental probability that the next person surveyed will say he or she did not like the movie? _____

6. For the past 30 days, Naomi has been recording the number of customers at her restaurant between 10 A.M. and 11 A.M. During that hour, there have been fewer than 20 customers on 25 out of 30 days.

   a. What is the experimental probability that there will be fewer than 20 customers on the thirty-first day? _____

   b. What is the experimental probability that that there will be more than 20 customers on the thirty-first day? _____

7. For the past four weeks, Nestor has been recording the daily high temperatures. During that time, the high temperature has been below 45° on 20 out of 28 days. What is the experimental probability that the high temperature will be below 45° on the twenty-ninth day? _____

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Problem Solving

Experimental Probability

Write the correct answer as a fraction in simplest form.

This table shows a breakdown by format of total music sales in the United States in 2004.

Total American Music Sales in 2004

Format	Total (% of units shipped)
CD	80
Digital Single	15
Music Video	3
Other	2

1. What is the experimental probability that any random music purchase in 2004 was a CD?

_____

2. What is the experimental probability that any random music purchase in 2004 was not a Music Video?

_____

3. What is the experimental probability that any random music purchase in 2004 was a digital single?

_____

4. Which combination of sales has an experimental probability of $\frac{1}{20}$?

_____

Choose the letter for the best answer.

5. Ethan hits 4 ringers in 10 attempts while pitching horseshoes. What does an experimental probability of $\frac{2}{5}$ describe?

   A *P*(horseshoes)
   B *P*(missed shots)
   C *P*(attempts)
   D *P*(ringers)

6. Jay beats Terry at table tennis 3 out of 5 games. What is the experimental probability that Terry will win their next game?

   F $\frac{1}{2}$ **H** $\frac{2}{5}$
   G $\frac{3}{5}$ **J** 1

7. Poonam counts 10 classmates out of 36 people in the library. What is the experimental probability that the next person will be a classmate?

   A $\frac{5}{36}$ **C** $\frac{1}{36}$
   B $\frac{5}{18}$ **D** $\frac{1}{10}$

8. Macy makes 15 of 20 free throws at basketball practice. What is the experimental probability that she will miss her next free throw?

   F $\frac{1}{4}$ **H** $\frac{2}{3}$
   G $\frac{1}{2}$ **J** $\frac{3}{4}$

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Practice C

Experimental Probability

Find the experimental probability. Write your answer as a fraction, as a decimal, and as percent.

1. Luke is practicing his tennis serve. If he gets 21 out of 27 serves in, what is the experimental probability that he will get the next serve in? _____

2. Jose saw 50 people. Fourteen of them were wearing red shirts and 17 were wearing blue shirts. What is the experimental probability that the next person he sees will be wearing a blue shirt? _____

Solve.

3. During an exit survey after a play, 75 of the first 120 people surveyed said they did not like the play.

   a. What is the experimental probability that the next person surveyed will say he or she liked the play? _____

   b. What is the experimental probability that the next person surveyed will say he or she did not like the play? _____

4. For the past two weeks, Jimmy has been counting the number of joggers in the park between 8 P.M. and 9 P.M. each evening. In that time, there have been 40 or more joggers on 7 out of 14 days.

   a. What is the experimental probability that that there will be 40 or more joggers on the fifteenth day? _____

   b. What is the experimental probability that that there will be fewer than 40 joggers on the fifteenth day? _____

5. If Kathy hit the dartboard 9 out of 15 times and Toby hit the dartboard 14 out of 20 times, who has the greater experimental probability of hitting the dartboard on his or her next try? _____

6. Mona works at a snack bar. Of the first 25 hot dogs ordered one day, 19 were ordered with sauerkraut. If the snack bar expects to sell 150 hot dogs on any day, how many would they expect to be ordered with sauerkraut? _____