10 Chapter Review

Check It Out
Vocabulary Help
BigIdeasMath.com

Review Key Vocabulary

experiment, *p. 402*
outcomes, *p. 402*
event, *p. 402*
favorable outcomes, *p. 402*
probability, *p. 408*
relative frequency, *p. 412*
experimental probability, *p. 414*
theoretical probability, *p. 415*
sample space, *p. 422*
Fundamental Counting Principle, *p. 422*
compound event, *p. 424*
independent events, *p. 430*
dependent events, *p. 431*
simulation, *p. 436*
population, *p. 440*
sample, *p. 440*
unbiased sample, *p. 442*
biased sample, *p. 442*

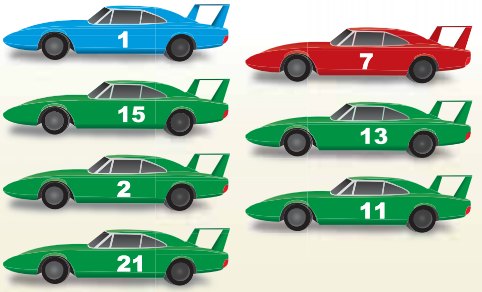
Review Examples and Exercises

10.1 Outcomes and Events *(pp. 400–405)*

You randomly choose one toy race car.

a. In how many ways can choosing a green car occur?

b. In how many ways can choosing a car that is *not* green occur? What are the favorable outcomes of choosing a car that is *not* green?



a. There are 5 green cars. So, choosing a green car can occur in 5 ways.

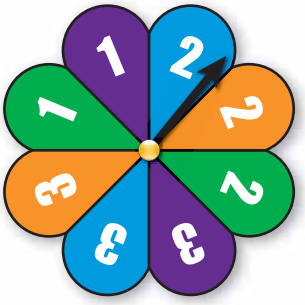
b. There are 2 cars that are *not* green. So, choosing a car that is *not* green can occur in 2 ways.

green	*not* green
green, green, green, green, green	blue, red

The favorable outcomes of the event are blue and red.

Exercises

You spin the spinner. (a) Find the number of ways the event can occur. (b) Find the favorable outcomes of the event.



1. Spinning a 1
2. Spinning a 3
3. Spinning an odd number
4. Spinning an even number
5. Spinning a number greater than 0
6. Spinning a number less than 3

10.2 Probability *(pp. 406–411)*

You flip a coin. What is the probability of flipping tails?

$$P(\text{event}) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

$$P(\text{tails}) = \frac{1}{2}$$

There is 1 tails.

There is a total of 2 sides.

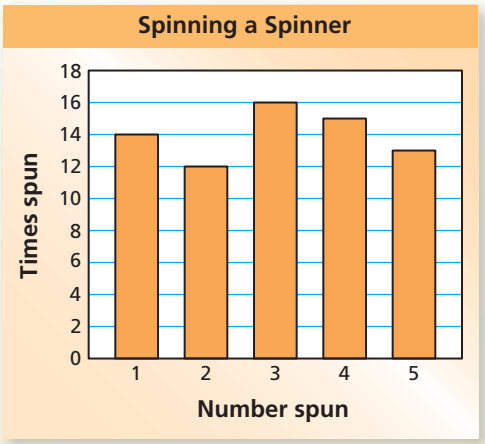
The probability of flipping tails is $\frac{1}{2}$, or 50%.

Exercises

7. You roll a number cube. Find the probability of rolling an even number.

10.3 Experimental and Theoretical Probability *(pp. 412–419)*

a. The bar graph shows the results of spinning the spinner 70 times. What is the experimental probability of spinning a 2?



The bar graph shows 12 twos. So, the spinner landed on two 12 times in a total of 70 spins.

$$P(\text{event}) = \frac{\text{number of times the event occurs}}{\text{total number of trials}}$$

Two was landed on 12 times.

$$P(2) = \frac{12}{70} = \frac{6}{35}$$

There was a total of 70 spins.

The experimental probability is $\frac{6}{35}$, or about 17%.

b. The theoretical probability of choosing a purple grape from a bag is $\frac{2}{9}$. There are 8 purple grapes in the bag. How many grapes are in the bag?

$$P(\text{purple}) = \frac{\text{number of purple grapes}}{\text{total number of grapes}}$$

$$\frac{2}{9} = \frac{8}{g}$$ Substitute. Let g be the total number of grapes.

$$g = 36$$ Solve for g.

So, there are 36 grapes in the bag.

Exercises

Use the bar graph on page 456 to find the experimental probability of the event.

8. Spinning a 3

9. Spinning an odd number

10. *Not* spinning a 5

11. Spinning a number greater than 3

Use the spinner to find the theoretical probability of the event.

12. Spinning blue

13. Spinning a 1

14. Spinning an even number

15. Spinning a 4

16. The theoretical probability of spinning an even number on a spinner is $\frac{2}{3}$. The spinner has 8 even-numbered sections. How many sections are on the spinner?

10.4 Compound Events *(pp. 420–427)*

a. How many different home theater systems can you make from 6 DVD players, 8 TVs, and 3 brands of speakers?

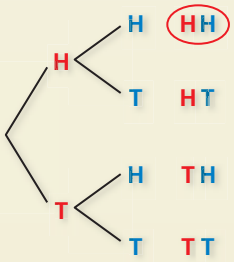
$6 \times 8 \times 3 = 144$ Fundamental Counting Principle

So, you can make 144 different home theater systems.

b. You flip two pennies. What is the probability of flipping two heads?

Use a tree diagram to find the probability. Let H = heads and T = tails.

There is one favorable outcome in the sample space for flipping two heads: HH.



$$P(\text{event}) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

$P(2 \text{ heads}) = \frac{1}{4}$ Substitute.

The probability is $\frac{1}{4}$, or 25%.

Exercises

17. You have 6 bracelets and 15 necklaces. Find the number of ways you can wear one bracelet and one necklace.

18. You flip two coins and roll a number cube. What is the probability of flipping two tails and rolling an even number?

10.5 Independent and Dependent Events *(pp. 428–437)*

You randomly choose one of the tiles and flip the coin. What is the probability of choosing a vowel and flipping heads?

Choosing one of the tiles does not affect the outcome of flipping the coin. So, the events are independent.

$P(\text{vowel}) = \frac{2}{7}$

There are 2 vowels (A and E).

There is a total of 7 tiles.

$P(\text{tails}) = \frac{1}{2}$

There is 1 tails side.

There is a total of 2 sides.

Use the formula for the probability of independent events.

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

$$= \frac{2}{7} \cdot \frac{1}{2} = \frac{1}{7}$$

The probability of choosing a vowel and flipping heads is $\frac{1}{7}$, or about 14%.

Exercises

You randomly choose one of the tiles above and flip the coin. Find the probability of the compound event.

19. Choosing a blue tile and flipping tails

20. Choosing the letter G and flipping tails

You randomly choose one of the tiles above. Without replacing the first tile, you randomly choose a second tile. Find the probability of the compound event.

21. Choosing a green tile and then a blue tile

22. Choosing a red tile and then a vowel

10.6 Samples and Populations *(pp. 440–447)*

You want to estimate the number of students in your school whose favorite subject is math. You survey every third student who leaves the school. Determine whether the sample is *biased* or *unbiased*.

The sample is representative of the population, selected at random, and large enough to provide accurate data.

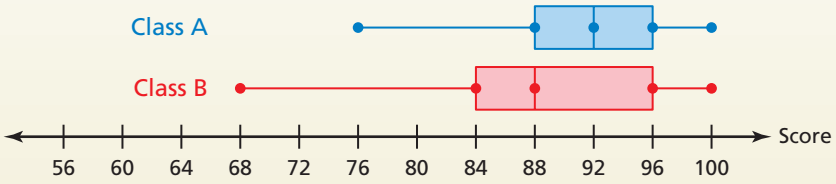
So, the sample is unbiased.

Exercises

23. You want to estimate the number of students in your school whose favorite subject is biology. You survey the first 10 students who arrive at biology club. Determine whether the sample is *biased* or *unbiased*. Explain.

10.7 Comparing Populations *(pp. 448–453)*

The double box-and-whisker plot shows the test scores for two French classes taught by the same teacher.



a. Compare the populations using measures of center and variation.

Both distributions are skewed left, so use the median and the IQR.

The median for Class A, 92, is greater than the median for Class B, 88. The IQR for Class B, 12, is greater than the IQR for Class A, 8. The scores in Class A are generally greater and have less variability than the scores in Class B.

b. Express the difference in the measures of center as a multiple of each measure of variation.

$$\frac{\text{median for Class A} - \text{median for Class B}}{\text{IQR for Class A}} = \frac{4}{8} = 0.5$$

$$\frac{\text{median for Class A} - \text{median for Class B}}{\text{IQR for Class B}} = \frac{4}{12} = 0.3$$

So, the difference in the medians is about 0.3 to 0.5 times the IQR.

Exercises

24. SPANISH TEST The double box-and-whisker plot shows the test scores of two Spanish classes taught by the same teacher.

a. Compare the populations using measures of center and variation.

b. Express the difference in the measures of center as a multiple of each measure of variation.