pg. 636-637 (# 1-4, 6-26 even, 27-31)

1. event; It is a collection of several outcomes.

2. An outcome is one possible result of an experiment. A favorable outcome is an outcome of a specific event.

3. 8

4. 4 ways; 4 ways

6. 6

8. 6, 7, 8, 9

10. 1, 2

12. **a.** 2 ways **b.** blue, blue

14. **a.** 2 ways

b. purple, purple

16. **a.** 6 ways

b. yellow, green, blue, blue, purple, purple

18. There are 7 marbles that are *not* purple, even though there are only 4 colors. Choosing *not* purple could be red, red, red, blue, blue, green, or yellow.

20. false; red

22. false; five

24. false; eight

26. See *Taking Math Deeper*.

27. $x = 2$

28. $n = 21$

29. $w = 12$

30. $b = 68$

31. C

pg. 642-643 (# 1-5, 6-20 even, 21, 23-27)

1. The probability of an event is the ratio of the number of favorable outcomes to the number of possible outcomes.
2. no; Probabilities are between 0 and 1, including 0 and 1.
3. *Sample answer:* You will not have any homework this week.; You will fall asleep tonight.
4. Spinner B; There are more chances to land on "Down" with Spinner B.
5. either; Both spinners have the same number of chances to land on "Forward."
6. likely
8. certain
10. equally likely to happen or not happen
12. $\frac{1}{5}$
14. $\frac{4}{5}$
16. The student found the probability of choosing a blue shirt.;

    $P(\textit{not}\ \text{blue}) = \frac{6}{10} = \frac{3}{5}$
18. See *Taking Math Deeper.*

20.

Father's Genes \ Mother's Genes	X	X
X	XX	XX
Y	XY	XY

21. There are 2 combinations for each.

23. $x < 4$;

24. $b \geq -5$;

25. $w > -3$;

26. $g \leq -3$;

27. C

pg. 649-651 (# 1-11, 14-34 even)

1. Perform an experiment several times. Count how often the event occurs and divide by the number of trials.
2. yes; You could flip tails 7 out of 10 times, but with more trials the probability of flipping tails should get closer to 0.5.
3. There is a 50% chance you will get a favorable outcome.
4. *Sample answer:* picking a 1 out of 1, 2, 3, 4
5. experimental probability; The population is too large to survey every person, so a sample will be used to predict the outcome.
6. $\frac{7}{50}$, or 14%
7. $\frac{12}{25}$, or 48%
8. $\frac{7}{25}$, or 28%
9. $\frac{21}{25}$, or 84%
10. $\frac{17}{50}$, or 34%
11. 0, or 0%

14. 5 cards

16. $\frac{1}{6}$, or about 16.7%

18. $\frac{1}{2}$, or 50%

20. 0, or 0%

22. 30 chips

24. **a.** $\frac{4}{9}$, or about 44.4%

b. 5 males

26. theoretical: $\frac{1}{5}$, or 20%;

experimental: $\frac{39}{200}$, or 19.5%;

The experimental probability is close to the theoretical probability.

28. theoretical

30–32. See *Taking Math Deeper*.

30–32. See *Taking Math Deeper*.

34. **a.** Check students' work. The cup should land on its side most of the time.

b. Check students' work.

c. Check students' work.

d. more likely; Due to the added weight, the cup will be more likely to hit open-end up and thus more likely to land open-end up. Some students may justify by performing multiple trials with a quarter taped to the bottom of the cup.

pg. 657-659 (#1-5, 6-28 even)

1. A sample space is the set of all possible outcomes of an event. Use a table or tree diagram to list all the possible outcomes.

2. An event M has m possible outcomes and event N has n possible outcomes. The total number of outcomes of event M followed by event N is $m \times n$.

3. You could use a tree diagram or the Fundamental Counting Principle. Either way, the total number of possible outcomes is 30.

4. *Sample answer:* choosing two marbles from a bag

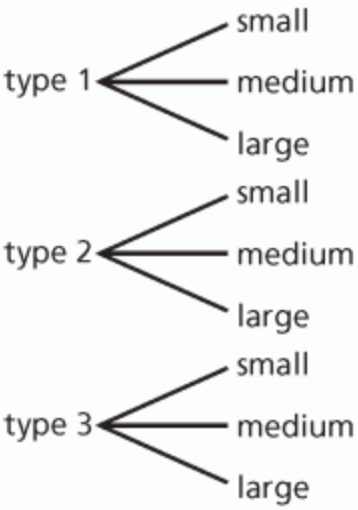
5. 125,000

6. *Sample space:*
Miniature golf 1 P.M.–3 P.M.,
Miniature golf 6 P.M.–8 P.M.,
Laser tag 1 P.M.–3 P.M.,
Laser tag 6 P.M.–8 P.M.,
Roller skating 1 P.M.–3 P.M.,
Roller skating 6 P.M.–8 P.M.;
6 possible outcomes

8. 21

10. 24

12. Tree Diagram:



Fundamental Counting Principle: $3 \cdot 3 = 9$

14. **a.** tree diagram or the Fundamental Counting Principle

b. 12 possible outcomes

16. $\frac{1}{5}$, or 20%

18. 0, or 0%

20. $\frac{3}{10}$, or 30%

22. $\frac{1}{9}$, or $11\frac{1}{9}\%$

24. $\frac{2}{9}$, or $22\frac{2}{9}\%$

26. **a.** $\frac{1}{100}$, or 1%

b. It increases the probability that your choice is correct to $\frac{1}{25}$, or 4%, because each digit could be 0, 2, 4, 6, or 8.

28. See *Taking Math Deeper.*

pg. 676-677 (# 1-4, 6-18 even)

1. Samples are easier to obtain.
2. You should make sure the people surveyed are selected at random and are representative of the population, as well as making sure your sample is large enough.
3. Population: Residents of New Jersey
   Sample: Residents of Ocean County
4. Population: All cards in a deck
   Sample: 4 cards
6. unbiased; The sample is representative of the population, selected at random, and large enough to provide accurate data.
8. yes; The sample is representative of the population, selected at random, and large enough to provide accurate data. So, the sample is unbiased and the conclusion is valid.
10. Sample B because it is a larger sample.
12. 696 students
14. A population because there are few enough students in your homeroom to not make the surveying difficult.
16. 1260 students

18. **a.** *Sample answer:* The person could ask, "Do you agree with the town's unfair ban on skateboarding on public property?"

b. *Sample answer:* The person could ask, "Do you agree that the town's ban on skateboarding on public property has made the town quieter and safer?"

pg. 665-667 (# 1-4, 6-12 even, 13, 14-26 even)

1. What is the probability of choosing a 1 and then a blue chip?; $\frac{1}{15}; \frac{1}{10}$

2. For independent events, find the probability of the first event, find the probability of the second event, and then multiply. For dependent events, find the probability of the first event, find the probability of the second event after the first event occurs, and then multiply.

3. independent; The outcome of the first roll does not affect the outcome of the second roll.

4. dependent; Your friend's lane number cannot be the same as your lane number. So, your friend's lane number depends on your lane number.

6. $\frac{1}{4}$

8. $\frac{3}{8}$

10. $\frac{1}{14}$

12. $\frac{2}{7}$

13. The two events are dependent, so the probability of the second event is $\frac{1}{3}$.

$P(\text{red and green}) = \frac{1}{4} \cdot \frac{1}{3} = \frac{1}{12}$

14. dependent; The second draw is affected by the first draw.

16. $\frac{1}{4}$, or 25%

18. $\frac{1}{162}$, or about 0.62%

20. $\frac{10}{81}$, or about 12.3%

22. $\frac{20}{81}$, or about 24.7%

24. 51.2%

26. See *Taking Math Deeper.*

pg. 684-685 (# 1-8)

1. When comparing two populations, use the mean and the MAD when each distribution is symmetric. Use the median and the IQR when either one or both distributions are skewed.

2. There will probably be little or no visual overlap of the data. The core (center) portions of the data are too far apart.

3. **a.** garter snake: mean = 25, median = 24.5, mode = 24,
range = 20, IQR = 7.5, MAD ≈ 4.33
water snake: mean = 31.5, median = 32, mode = 32,
range = 20, IQR = 10, MAD ≈ 5.08

   b. The water snakes have greater measures of center because the mean, median, and mode are greater. The water snakes also have greater measures of variation because the interquartile range and mean absolute deviation are greater.

4. **a.** Team A:
median = 3, IQR = 2
Team B:
median = 7, IQR = 2
The variation in the goals scored is the same, but Team B usually scores about 4 more goals per game.

b. The difference in the medians is 2 times the IQR.

5. **a.** Class A: median = 90, IQR = 12.5
Class B: median = 80, IQR = 10
The variation in the test scores is about the same, but Class A has greater test scores.

b. The difference in the medians is 0.8 to 1 times the IQR.

6. **a.** volleyball: mean = 86, MAD = 19.6
basketball: mean = 185, MAD = 17.7
The variation in the attendances is about the same, but basketball has a greater attendance.

b. The difference in the means is about 5.1 to 5.6 times the MAD.

7. See *Taking Math Deeper.*

8. **a.** The mean and MAD for the sports magazine, 19 and 5.8, are close to the mean and MAD for the political magazine, 18 and 5.2. However, the sample size is small and the variability is too great to conclude that the number of words per sentence is about the same.

b. The sample means vary much less than the sample numbers of words per sentence.

c. The number of words per sentence is generally greater in the political magazine than in the sports magazine.

Name Answers Date

Chapter 15 – Study Guide

Complete this study guide with the assistance of your notes and book.

15.1 - Outcomes and Events:

Vocabulary

Outcomes - The possible results of an experiment

Event - A collection of 1 or more outcomes.

Favorable Outcomes - The outcomes of a specific event.

You randomly choose one of the tiles shown below. Find the favorable outcomes of the event. DO NOT GIVE THE PROBABILITY.

1) Choosing a 4

4

2) Choosing an even number

2, 4, 6, 8

3) Choosing a number less than 2

1

4) Choosing an odd number greater than 6

7, 9

5) Choosing a number divisible by 2

2, 4, 6, 8

6) Choosing a number greater than 10

None

7) A beverage cooler contains bottles of orange juice and apple juice. There are 44 bottles in the cooler.

a) You are **equally likely** to randomly choose a bottle of orange juice or a bottle of apple juice from the cooler. How many of the bottles are apple juice?

22

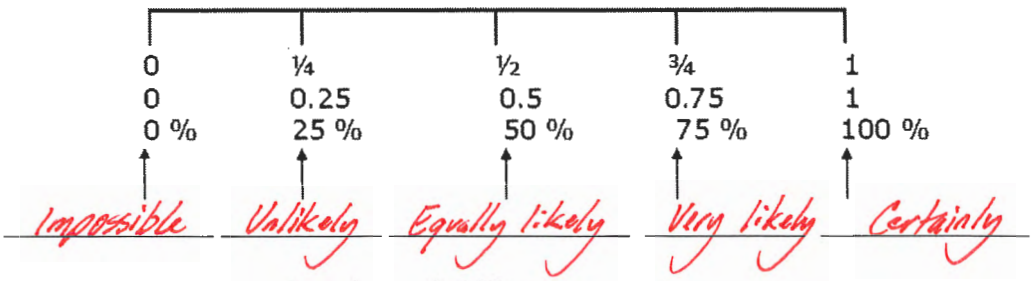
b) Two of the bottles of orange juice are replaced with apple juice. How many ways can you randomly choose a bottle of apple juice from the cooler?

24

15.2 - Outcomes and Events:

8) Complete the formula for probability: $P(event) = \dfrac{\text{Number of favorable outcomes}}{\text{Number of possible outcomes}}$

9) What words/phrase would describe the likelihood of the following in the probability scale:



Describe the likelihood of the event given its probability.

10) The probability that it will snow today is zero. Impossible

11) You make a free throw 70% of the time. Very likely

12) Your band marches in $\frac{1}{6}$ of the parades. Unlikely

You randomly choose one song from a collection of 4 country songs, 2 jazz songs, 3 rock songs, and 1 pop song. Find the probability of the event.

13) Choosing a jazz song $\frac{1}{5}$

14) Choosing a pop song $\frac{1}{10}$

15) *Not* choosing a country song $\frac{3}{5}$

16) Choosing a blues song 0

17) In a classroom, the probability that the teacher chooses a boy from 20 students is 0.45.

a) How many students are *not* boys?

$20 \times .45 = 9$

$20 - 9 =$ 11 students

b) Describe the likelihood of *not* choosing a boy.

Equally likely

15.3 - Experimental and Theoretical Probability:

18) Complete the formula: *Relative Frequency* = $\frac{\text{Number of times the event occurs}}{\text{Total number of times for the experiment}}$

19) Complete the formula: *Experimental Probability* = $\frac{\text{Number of times the event occurs}}{\text{Total number of trials}}$

20) You have four sticks. Two sticks have one blue side and one pink side. One stick has 2 blue sides. One stick has 2 pink sides. You throw the sticks 20 times and record the results. Use the table to find the experimental probability of the event.

Outcome	Frequency
3 blue, 1 pink	7
2 blue, 2 pink	9
1 blue, 3 pink	4

a) Tossing 1 pink and 3 blue $\frac{7}{20}$

b) Tossing the same number of blue and pink $\frac{9}{20}$

c) *Not* tossing 3 pink $\frac{4}{5}$

d) Tossing at most 2 blue $\frac{13}{20}$

21) You flip 3 coins 50 times, and flipping 3 tails occurs 6 times.

a) What words above refer to the *total number of trials*? "50 times"

b) What words above refer to the *number of times the event occurs*? "occurs 6 times"

c) What words above refer to the *event*? "flipping 3 tails"

d) What is the experimental probability that you flip 3 tails? $\frac{3}{25}$

e) How many times would you expect to flip 3 tails out of 200 trials of flipping coins?

$\frac{3}{25} = \frac{x}{200}$ 24 times

15.4 - Compound Events:

Vocabulary

Sample Space - The set of all possible outcomes of 1 or more events.

22) What are two ways that you possibly display a sample space?

Tables and tree diagrams

Use a tree diagram to find the sample space and the total number of possible outcomes.

23)

Pet	
Animal	Hamster, Guinea Pig, Snake
Name	Lucky, Shadow, Smokey, Max

HL
HSh
HSm
HM
GL
GSh
GSm
GM
SnL
SnSh
SnSm
SnM

12 outcomes

24)

Ice Cream	
Cone	Waffle, Sugar
Flavor	Chocolate, Vanilla, Strawberry

WC
WV
WSt

SC
SV
SSt

6 outcomes

Use the Fundamental Counting Principle to find the total number of possible outcomes. SHOW WORK.

25)

Pizza	
Size	Small, Medium, Large
Crust	Thin, Thick, Regular

3×3 = 9 outcomes

26)

Car	
Transmission	Automatic, Manual
Doors	2-door, 4-door
Color	Red, Blue, Black, White

2×2×4 = 16 outcomes

15.5 - Independent and Dependent Events:

27) You throw the bowling ball at the pins. You have two throws to knock down ten pins.

First Throw: You knock down 6 pins. Second Throw: You knock down 1 pin.

Are these events independent or dependent events? Explain?

Dependent. The second throw is affected by the first throw.

28) You roll a number cube twice.

First Roll: You roll an odd number. Second Roll: You roll a number less than 2.

Are these events independent or dependent events? Explain?

Independent. The events do not affect each other.

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

29) Choosing a 6 and then a prime number

$\frac{1}{7} \cdot \frac{4}{6} = \frac{4}{42} = \frac{2}{21}$

30) Choosing two odd numbers

$\frac{4}{7} \cdot \frac{3}{6} = \frac{2}{7}$

31) Choosing a 6 and then a number greater than 4

$\frac{1}{7} \cdot \frac{2}{6} = \frac{1}{21}$

15.6 - Samples and Populations

Identify which one among the pair of groups is the population and which one is the sample.

32) All students in a school

Population

30 students in the school

Sample

33) 75 strawberries in the field

Sample

All the strawberries in the field

Population

34) You want to know the number of students in your school who read some of the newspaper at least once a week. You survey 30 random students that you meet in the hallway between classes.

a) What is the population of your survey?

All the students in your school

b) What is the sample of your survey?

30 random students that you meet in the hallway

c) Is the sample biased or unbiased? Explain.

Unbiased. The size is representative of the sample and it's random.

For each problem, which sample is better for making a prediction? Explain.

35)

Predict the number of residents in St. Lucie County who own a home.	
Sample A	A random sample of 100 residents in the county
Sample B	A random sample of 100 residents in the city of Fort Pierce

A: Surveyed the country rather than one city

36)

Predict the number of people at a beach who are wearing sunscreen.	
Sample A	A random sample of 50 people at the beach
Sample B	A random sample of 5 people at the beach

A: Large sample size

Determine whether you would survey the population or a sample. Explain.

37) You want to know the average weight of the members of your family.

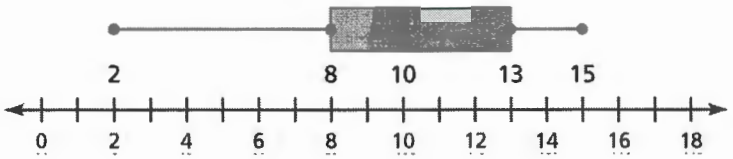
Population. You have access to all the members of your family

38) You want to know the number of grocery stores in Florida that carry your favorite cereal.

Sample. It would not be easy to contact or visit every grocery

15.7 - Comparing Populations

39) The box-and-whisker plot represents the numbers of cocoons in each butterfly tent.



a) What percent of the butterfly tents contain at most 10 cocoons?

50%.

b) Are the data more spread out below the first quartile or above the third quartile? Explain.

Below the first quartile. There is a greater difference between the minimum and Q1.

c) Find and interpret the interquartile range of the data.

IQR = 5. The middle 50% of the data has a range of 5

d) What are the most appropriate measures to describe the center and variation of the distribution?

Median and IQR.