Name _____ Period _____ Date _____

Grade 7 Unit 4 Model Curriculum Assessment

1. Justin is mixing punch for his birthday party. His recipe calls for $2\frac{1}{2}$ cups of cranberry juice and serves 12 people. Using the recipe, how many more cups of cranberry juice are needed to make punch for 18 people than are needed to make punch for 12 people?

   a. $1\frac{1}{4}$
   b. $2\frac{1}{2}$
   c. 6
   d. $7\frac{1}{2}$

2. There are 15 students in Mr. Weiss's chess club. The ratio of the number of boys to the number of girls in the club is $3:2$. If the number of boys in the club does not change, how many additional girls would need to join the club in order for the ratio of the number of boys to the number of girls in the club to be $1:1$?

   a. 3
   b. 6
   c. 9
   d. 12

3. There were 450 students enrolled in a middle school at the beginning of the school year. The number of students enrolled in the school at the end of the year was 10 percent greater than the number of students enrolled in the school at the beginning of the year. How many students were enrolled in the school at the end of the year?

a. 45
b. 460
c. 495
d. 500

4. Ali and Renu are buying concert tickets from a web site. There is an 18% service fee for every ticket bought from the site. If the cost of 2 tickets, including the service fee, was $59, what was the cost of each ticket before applying the service fee? Show your work.

5. Stacia was 5 feet tall on her 12th birthday and 5 feet 3 inches tall on her 13th birthday. What was the percent increase in Stacia's height from her 12th birthday to her 13th birthday? Show your work.

6. In a town with a population of 85,000, 35 percent of the voters are registered as independent. In a sample of 1,000 voters randomly chosen for a survey, 25 percent were registered as independent. Which statement best describes why the sample was **NOT** valid?

   a. The sample was chosen at random.
   b. The sample included many more people than was necessary.
   c. The sample did not include all the voters in the city.
   d. The sample was not representative of the voters registered as independent.

7. Of the 800 seventh grade students and 640 eighth grade students at Knox Middle School, 90 students will be chosen at random to attend an assembly. Which of the following would be a representative sample of the number of seventh and eighth grade students at the school?

   a. 70 seventh grade students and 20 eighth grade students
   b. 60 seventh grade students and 30 eighth grade students
   c. 50 seventh grade students and 40 eighth grade students
   d. 40 seventh grade students and 50 eighth grade students

8. At John Jay Junior High School, 75 percent of the students buy lunch in the cafeteria every day. A sample of 120 students completed a survey about the lunches offered in the cafeteria. Of the students who completed the survey, 80 buy lunch in the cafeteria every day. Is the sample representative of the students at the high school with reference to the number of students who buy lunch in the cafeteria every day? Explain your answer.

9. A car dealership wants to conduct a survey of 100 people who bought a new or used car at the dealership in the last three months. Of the people who bought a car at the dealership in the last three months,

- 2,000 bought a new car
- 1,600 of the new car buyers received a loan
- 500 bought a used car
- 300 of the used car buyers received a loan

Complete the table below to show the number of people the dealership should survey in each group so that the sample is representative of whether the buyers bought a new car or a used car and whether the buyers received a loan.

	Bought a new car	Bought a used car
Received a loan		
Did **NOT** receive a loan		

10. There are 500 students at Jacob's school. Jacob wants to conduct a survey of the students at his school to determine the level of interest in participating in a musical. Which of the following is most likely to produce a representative sample of students' interest in participating in the musical?

    a. A survey of every fifth student to arrive at school one day
    b. A survey of the first 100 students to arrive at school one day
    c. A survey of the students in one randomly selected homeroom
    d. A survey of the students who take theater classes and music classes

11. There are 850 students at Dan's school. Dan asked the 31 students in his homeroom which class at school was their favorite, and 70 percent of the students said that art class was their favorite. In an article in the school newspaper, Dan stated that art class was the most popular class at the school. Is Dan's conclusion valid? Explain your answer.

12. Jeanette chose 100 of the 1,500 students at her school at random and asked what was their favorite team sport to play. The results are shown in the table below.

Favorite Team Sport	Number of Students
Basketball	33
Soccer	31
Football	18
Other	11
None	7

Part A: Based on the results in the table, is it valid to infer that more students at Jeanette's school like to play basketball than football? Explain your answer.

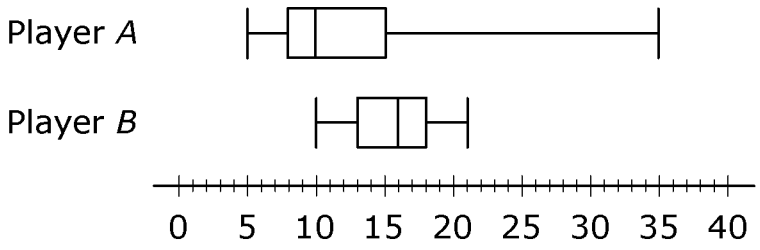
Part B: Based on the results in the table, is it valid to infer that more students at Jeanette's school like to play basketball than soccer? Explain your answer.

13. In 2010, there were 566 municipalities in New Jersey. The greatest population in a municipality was 278,154, and the lowest population in a municipality was 5. A researcher selected samples of 20 New Jersey municipalities at random and determined the mean population for the municipalities in each sample. The table below shows the results for three samples.

Sample	Mean Population per Municipality
Sample 1	12,875
Sample 2	19,060
Sample 3	18,170

Explain why the mean populations could be so different across the three samples.

14. The parallel box plots below describe the number of home runs hit by Player *A* and Player *B* in each of the last 11 baseball seasons. Based on the information shown, which player is more likely to hit a greater number of home runs next season? Explain your answer.



15. The stem-and-leaf plots below show the number of used cars sold at two different car dealerships, Car World and Cars R Us, for each month of the past 11 months, where $5 \mid 8$ represents 58 used cars sold.

Car World

4	7 9
5	5 8 8
6	2 7 8 9
7	3 6

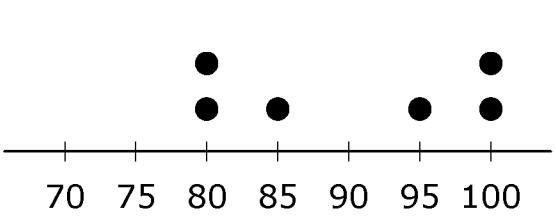
Cars R Us

4	2 5
5	0 2 4 8
6	2 2 9
7	1 3

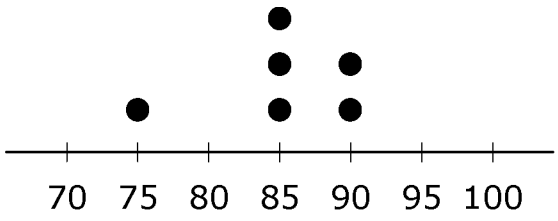
Part A: The mean absolute deviation of the number of used cars sold at Car World is approximately 7.82. What is the mean absolute deviation of the number of cars sold at Cars R Us? Round your answer to the nearest hundredth.

Part B: Based on your answer to part A, at which dealership did the number of used cars sold vary more from month to month? Explain your answer.

16. Two students recorded their quiz scores in math class during a marking period. The results are shown on the line plots below.



Kim's Quiz Scores



Megan's Quiz Scores

In each of the following sentences, fill in the blank with **greater than**, **less than**, or **equal to** make a true statement.

The mean of Kim's quiz scores is _____

the mean of Megan's quiz scores.

The mean absolute deviation of Kim's quiz scores is

_____ the mean absolute deviation of

Megan's quiz scores.

17. If an event is likely to occur, which of the following best describes the probability that the event will occur?

a. The probability is between 0 and $\frac{1}{4}$.

b. The probability is between $\frac{1}{4}$ and $\frac{1}{2}$.

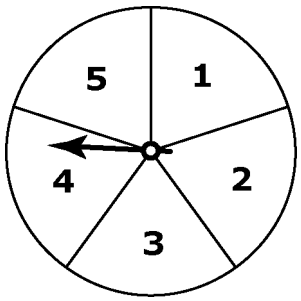
c. The probability is between $\frac{1}{2}$ and $\frac{3}{4}$.

d. The probability is between $\frac{3}{4}$ and 1.

18. For the school fair, 3 English teachers, 8 math teachers, 5 science teachers, and 4 social studies teachers volunteered for the dunking booth. One of the teachers will be chosen at random for the dunking booth.

Is it likely that a math teacher will be chosen for the dunking booth? Explain your answer.

19. Each time the spinner represented below is spun, it lands on a number. When the spinner is spun 150 times, what is the expected number of times that the arrow will land on the number 5? Explain your answer.



20. Alfie tossed a paper cup in the air 350 times and recorded whether it landed right side up, upside down, or on its side. The results of the experiment are shown in the table below.

PAPER CUP EXPERIMENT

Result of Toss	Number of Times
Landed right side up	88
Landed upside down	52
Landed on its side	210

If Alfie tosses the paper cup 90 more times, what is the expected number of times that the cup will land on its side?

a. 30
b. 48
c. 54
d. 60

21. A group of students tossed an **unfair** coin 80 times. The coin landed on heads 48 times and tails 32 times. Based on these results, which of the following is most likely to be the results if the coin is tossed an additional 50 times?

a. 26 heads and 24 tails
b. 30 heads and 20 tails
c. 34 heads and 16 tails
d. 38 heads and 12 tails

22. Winston is a seventh-grade student at Brendan Byrne Middle School, where one homeroom will be chosen at random to give the morning announcements for the month of March. The table below shows the number of homerooms in each grade at the school.

Grade	Number of Homerooms
Sixth	5
Seventh	6
Eighth	4

Part A: What is the probability that Winston's homeroom will be chosen to give the morning announcements for the month of March?

Part B: What is the probability that a seventh-grade homeroom will be chosen to give the morning announcements for the month of March?

23. Sean has a total of 60 books on his book shelf. Of these, 25 are mystery books, 20 are fantasy books, 10 are biography books, and 5 are science books. Complete the table below to show the probability model of a type of book being chosen from the book shelf at random.

Type of Book	Probability
Mystery	
Fantasy	
Biography	
Science	

24. A fair number cube is numbered 1 through 6. Tamara rolled the cube 20 times, and the number 6 was the result 7 times. She concludes that if she rolled the cube 100 times, the number 6 would be the result 35 times. Is Tamara's conclusion reasonable? Explain your answer.

25. A bag contains 8 red, 6 white, and 10 blue marbles. One of these marbles is to be selected at random from the bag.

Complete the table below to create a possible probability model of the marbles in the bag.

Color	Probability
Red	
White	
Blue	

26. As part of a promotion, a soda company is including prize codes randomly under the caps of all the soda bottles it sells. Half of the bottles will contain a winning code, and half of the bottles will contain a losing code.

Part A: Draw a tree diagram to show all possible prize code outcomes of purchasing three soda bottles.

Part B: What is the theoretical probability that exactly two bottles will have a prize code under the cap when three bottles are purchased?

27. Two different digits are chosen from the digits 1 through 5 and are written down in the order they are chosen.

Part A: Make a list to show all possible outcomes.

Part B: What is the theoretical probability that both of the two digits are odd?

28. Describe a simulation that can be used to answer the problem below.

As part of a promotion, a company is putting random action figures of characters from a children's movie in boxes of cereal. There is one action figure in each box of cereal, and there are 4 different action figures to collect. On average, how many boxes of cereal will someone need to buy to collect all 4 different action figures?