Name _____ Date_____

Lesson 6: Describing the Center of a Distribution Using the Mean

1. If a class of 27 students had a mean of 72 on a test, interpret the mean of 72 in the sense of a "fair share" measure of the center of the test scores.

2. Suppose that your school's soccer team has scored a mean of 2 goals in each of 5 games.
   a. Draw a representation using cubes that displays that your school's soccer team has scored a mean of 2 goals in each of 5 games. Let one cube stand for one goal.

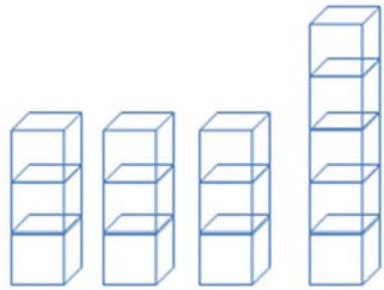
   b. Draw a dot plot that displays that your school's soccer team has scored a mean of 2 goals in each of 5 games.

1. A game was played where ten tennis balls are tossed into a basket from a certain distance. The number of successful tosses for six students were: 4, 1, 3, 2, 1, 7.
   a. Draw a representation of the data using cubes where one cube represents one successful toss of a tennis ball into the basket.
   b. Draw the original data set using a dot plot.

2. Find the mean number of successful tosses for this data set by Michelle's fair share method. For each step, show the cubes representation and the corresponding dot plot. Explain each step in words in the context of the problem. You may move more than one successful toss in a step, but be sure that your explanation is clear. You must show two or more steps.

Step described in words	"Fair Share" cube representation	Dot plot

3. The number of pockets in the clothes worn by four students to school today is $4, 1, 3, 6$. Paige produces the following cube representation as she does the fair share process. Help her decide how to finish the process of $3, 3, 3$, and 5 cubes.



4. Suppose that the mean number of chocolate chips in 30 cookies is 14 chocolate chips.
   a. Interpret the mean number of chocolate chips in terms of fair share.
   b. Describe the dot plot representation of the fair share mean of 14 chocolate chips in 30 cookies.

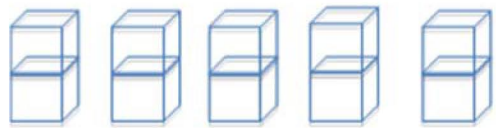
5. Suppose that the following are lengths (in millimeters) of radish seedlings grown in identical conditions for three days: $12\ 11\ 12\ 14\ 13\ 9\ 13\ 11\ 13\ 10\ 10\ 14\ 16\ 13\ 11$.
   a. Find the mean length for these 15 radish seedlings.
   b. Interpret the value from part (a) in terms of the "fair share" center length.

1. If a class of 27 students had a mean of 72 on a test, interpret the mean of 72 in the sense of a "fair share" measure of the center of the test scores.

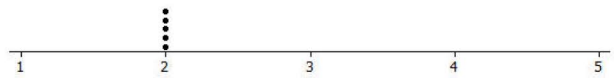
   72 would be the test score that all 27 students would have, were all 27 students to have the same score.

2. Suppose that your school's soccer team has scored a mean of 2 goals in each of 5 games.

   a. Draw a representation using cubes that displays that your school's soccer team has scored a mean of 2 goals in each of 5 games. Let one cube stand for one goal.

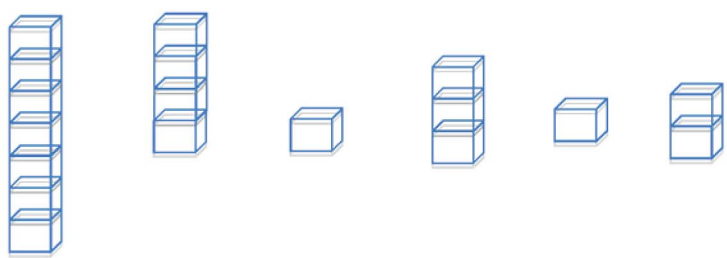


   b. Draw a dot plot that displays that your school's soccer team has scored a mean of 2 goals in each of 5 games.

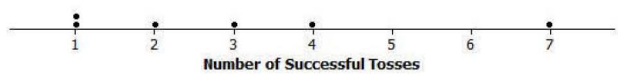


1. A game was played where ten tennis balls are tossed into a basket from a certain distance. The number of successful tosses for six students were: 4, 1, 3, 2, 1, 7.

   a. Draw a representation of the data using cubes where one cube represents one successful toss of a tennis ball into the basket.

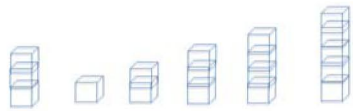
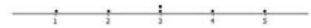
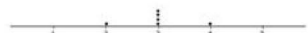


   b. Draw the original data set using a dot plot.

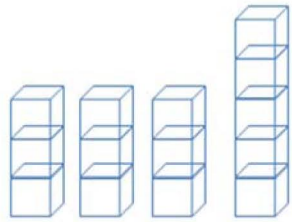


2. **Find the mean number of successful tosses for this data set by Michelle's fair share method. For each step, show the cubes representation and the corresponding dot plot. Explain each step in words in the context of the problem. You may move more than one successful toss in a step, but be sure that your explanation is clear. You must show two or more steps.**

Clearly, there are several ways of getting to the final cube representation that each of the six stacks will contain three cubes. Ideally, students will move one cube at a time since for many students the leveling is seen more easily in that way. If a student shortcuts the process by moving several cubes at once, that's okay, as long as the graphic representations are correctly done and the explanation is clear. The table provides one possible representation:

Step described in words	"Fair Share" cube representation	Dot plot
Share two of the cubes in the 7-cube stack with one of the 1-cube stacks. The result would be: 5, 4, 3, 3, 1, 2. The 7-stack went from 7 successful tosses to 5 successful tosses, and one of the 1-stacks went from 1 successful toss to 3 successful tosses.		
Suppose that the student who has 5 successful tosses shares two tosses with the student who had one successful toss. The student with 5 successful tosses went down two tosses to 3 successful tosses, and the student with one successful toss went up two tosses to 3 successful tosses.		
Finally, the student with 4 successful tosses shares one of them with the student who has 2 successful tosses. The final step of Michelle's fair share method shows an even number of tosses for each of the six students. So, the mean number of successful tosses for these six students is 3 tosses.		

3. The number of pockets in the clothes worn by four students to school today is $4, 1, 3, 6$. Paige produces the following cube representation as she does the fair share process. Help her decide how to finish the process of 3, 3, 3, and 5 cubes.



It should be clear to the student that there are two "extra" cubes in the stack of five cubes. Those two "extras" need to be distributed among the four students. That requires that each of the extra cubes needs to be split in half to produce four halves. Each of the four students gets half of a pocket to have a fair share mean of three and one-half pockets.

4. Suppose that the mean number of chocolate chips in 30 cookies is 14 chocolate chips.

   a. Interpret the mean number of chocolate chips in terms of fair share.

   If each of the 30 cookies were to have the same number of chocolate chips, each would have 14 chocolate chips.

   b. Describe the dot plot representation of the fair share mean of 14 chocolate chips in 30 cookies.

   The dot plot consists of 30 dots stacked over the number 14 on the number line.

5. Suppose that the following are lengths (in millimeters) of radish seedlings grown in identical conditions for three days: $12\ 11\ 12\ 14\ 13\ 9\ 13\ 11\ 13\ 10\ 10\ 14\ 16\ 13\ 11$.

   a. Find the mean length for these 15 radish seedlings.

   The mean length is $12\frac{2}{15}$ mm.

   b. Interpret the value from part (a) in terms of the "fair share" center length.

   If each of the 15 radish seedlings were to have the same length, each would have a length of $12\frac{2}{15}$ mm.

   Note: Students should realize what the cube representation for these data would look like but also realize that it may be a little cumbersome to move cubes around in the fair share process. Ideally, they would set up the initial cube representation and then use the mathematical approach of summing the lengths to be 182 mm which, when distributed evenly to 15 plants, by division would yield $12\frac{2}{15}$ mm as the fair share mean length.