Connect and Reflect

Key Ideas

- To calculate the mean, add all of the numbers in a set of data and then divide by the number of numbers.
  - The mean does not have to be a number in the set of data. For example, a school basketball team could score an average of 37.8 points per game, which could never happen in an actual game.
- The mode is the number that occurs most frequently in a set of data.
  - If no number repeats, there is no mode.
  - If more than one number repeats the most, there is more than one mode.
- The median is the middle value in a set of data after the numbers have been arranged in order.
  - If there is an even number of data values, then the median is the value halfway between the two middle numbers.

When could the median not be a number in the set of data?

4-11, 13-17

Practise

For help with #1 and #4, refer to Example 1 on page 303.

1. What is the average of each set of data?

a) 5, 4, 10, 5, 6

b) 2.2, 1.6, 1.9, 2.3, 2.1, 1.9

c) 30, 85, 50, 105, 100, 65, 20, 25

For help with #2 to #4, refer to Example 2 on page 304.

2. What is the mode of each set of data?

a) 3, 1, 8, 5, 3

b) 21, 15, 18, 21, 20, 18

c) 3, 8, 5, 12, 10, 8, 2

3. Determine the median and mode of each set of data.

a) 6, 4, 8, 6, 2, 9

b) 14, 5, 8, 11, 10

c) 18, 24, 16, 18, 24, 16, 18, 18

4. Determine the mean, median, and mode of each set of data.

a) 6, 7, 8, 9, 4, 11

b) 3.4, 2.2, 1.4, 4.6, 2.2, 1.4, 1.6, 1.6

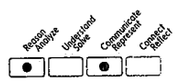
c) 120, 72, 100, 110, 150, 75, 73

d) 11, 5, 8, 11, 10

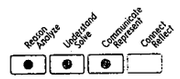
e) 14, 6, 14, 8, 10, 6, 10, 12

Apply

5. Over ten days, the school recycling team collected the following numbers of juice cans: 15, 20, 12, 16, 24, 20, 12, 20, 23, 17. Which value do you think would be more useful, mean or median, if you were trying to determine the average number collected per day? Why?



6. ✓ **Competency Check** Create a set of five numbers in which the median and mode are the same. Explain why you chose these numbers.

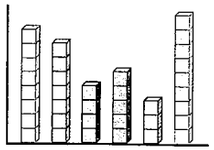


7. Dana wants to find the median of the following numbers: 3, 6, 5, 4, 2. She decides to order the numbers from greatest to least: 6, 5, 4, 3, 2. She removes outer pairs of numbers until she is left with the middle value, 4. Is she correct? Explain.

8. A toy store has six bins of stuffed animals. The bins contain 8, 7, 4, 5, 3, and 9 stuffed animals each.

a) What is the mean number of stuffed animals?

b) These linking cubes represent the stuffed animals. How could you level the vertical towers of linking cubes to determine the mean number of stuffed animals in a bin?



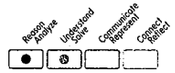
9. A store's sales of TVs on four Saturdays in February were 8, 7, 9, and 10. What was the mean number of Saturday sales in February?

10. In 12 hockey games, the Calgary Flames scored the following numbers of goals: 4, 4, 0, 2, 3, 3, 4, 1, 3, 0, 3, 2. What is the mode? How would this information be useful for the team?

11. Over a one-week period, students made the following number of daily downloads (in thousands, rounded to the nearest thousand): 34, 42, 37, 44, 46, 42, 51. What is the median number of downloads per day?

12. ✓ **Competency Check** Juanita scores the following points in her first six basketball games:

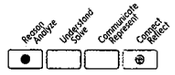
12 10 11 12 14 13



a) What is the average number of points she scored?

b) How many points would she need to score in her next game to increase her mean by 1 point for the seven games?

13. The frequency table shows the hourly wages of employees at a company.



Hourly Wages ($)	Number of Employees
15	4
16	2
18	3
20	2

a) What is the total number of employees?

b) What is the mode for the hourly wages? **Hint:** Since four people earn $15 per hour, record four 15s.

c) What is the median wage?

d) How would the mode and median change if one employee gets a raise from $15 per hour to $16 per hour?

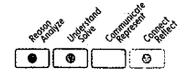
14. A cat gives birth to a litter of six kittens with the following weights: 95 g, 100 g, 100 g, 105 g, 110 g, 110 g.

a) What is the mode?

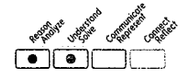
b) What is the median weight?

c) The cat has a second litter. The weights of these kittens are 90 g, 95 g, 100 g, 105 g, 110 g. What are the median and mode of the weights of all 11 kittens?

15. What is one possible set of 4 numbers that has a mode of 7 and a median of 11?



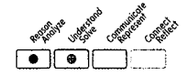
16. If the only mode for each data set is 4, what are all possible whole number values for n?



a) 5, 6, 7, 4, 2, n

b) 5, 6, 4, 4, n

17. If the median for each data set is 4, what are all possible whole number values for n?

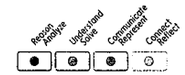


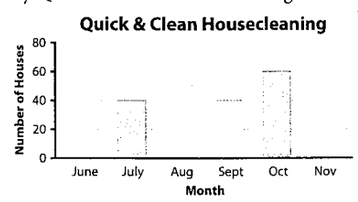
a) 3, 2, 6, 7, n

b) 1, 3, 4, 5, n

Extend

18. ✓ **Competency Check** The graph shows the number of homes cleaned by Quick & Clean Housecleaning.





a) What is the mean number of homes cleaned for the months shown?

b) Is there a mode? If so, what is it and how can you tell?

c) Estimate the median number of homes cleaned per month. Explain your reasoning.

19. ✓ **Competency Check** Five classmates have birthdays in March. The median of their birth dates is 12 (March 12) and the mode is 8. If the sum of the five birth dates is 56, determine a set of birth dates. Justify your reasoning.