All but #12

Connect and Reflect

Key Ideas

- The measure of central tendency that you use depends on the situation, the data that you have, and how the data are represented.
- Use the mean or median if the numbers in a data set are relatively close together.
- Use the median if the data set contains unusually large or small numbers relative to the rest of the data (outliers).
- Use the mode for data that represent frequency of choice (e.g., favourite colour).

Practise

For help with #1 to #3, refer to *Example 1* or *Example 2* on pages 209–210.

1. a) What are the mean, median, and mode for the following data set? Round your answers to the nearest tenth, if necessary.

   18 53 14 16 11 11 12 13 11

   b) Which measure(s) of central tendency best describe the data? Explain.

2. You want to find out your classmates' favourite movie. Which measure(s) of central tendency would best describe the data? Explain why.

3. A student records the following hours of volunteer work for each of the past ten months: 23, 18, 21, 19, 23, 26, 84, 22, 20, 16. Which measure of central tendency best represents the data? Explain why.

Apply

4. The tally chart represents the sizes of running shoes that were sold last Saturday.

Size	7	8	9	10
Number Sold	𝍸	𝍸		5

   a) What are the mean and the mode sizes of shoe?

   b) If you are restocking the shoes at the end of the day, which measure of central tendency is more meaningful? Why?

5. ✓ **Competency Check** A realtor in Rainbow Town sold the following houses in the past month.

House Description	Selling Price ($)
Red starter house	180 000
Blue house	440 000
Green house	440 000
Grey home	190 000
Pink mansion	2 160 000

   a) What are the median and mean prices?

   b) Which measure of central tendency is more representative of the house prices in Rainbow Town? How do you know?

6. Identify the measure of central tendency that best describes each of the following. Explain why you chose that measure.

   a) the number of pages in a typical textbook

   b) the most requested song at a school dance

   c) the middle ranked person on a basketball team, in terms of height

   d) the typical distance run around the track by a student in a Phys. Ed. class

   e) the most frequent number of successful serves by the members of a volleyball team during a serving practise

7. Pitas plays defence for her school's hockey team. Her time on the ice for each game is recorded as follows, to minutes: 21, 23, 19, 24, 23, 19, 26, 24.

a) Find the median and mean.

b) Find the mode(s). What do you notice?

c) Which measure of central tendency best describes a typical game for Pitas? Explain.

8. ✓ **Competency Check** A clothing store is ordering winter jackets. The table shows the sizes that sold last month.

Size	Frequency
36	1
38	3
40	5
42	7
44	4
46	2
48	1
50	1

a) Find the three measures of central tendency. Explain how you found them.

b) Which of them measures is the most important to the store manager? Explain why.

9. Seven judges gave the following scores for Susan's diving performance: 7.3, 6.8, 7.3, 8.0, 8.5, 8.2, 6.8.

a) What is the mean? Round your answer to the nearest tenth.

b) What is the median?

c) What is the mode?

d) Which measure(s) of central tendency best represent the centre of the data? Explain why.

10. In many diving competitions, the high score and the low score are thrown out and the diver's actual score is determined from the five remaining scores.

a) Why do think the practice of removing the high and the low score is used?

b) In #9, remove the high and the low scores and recalculate the mean, median, and mode. Which measures of central tendency are affected the most?

11. A school is collecting canned food for a holiday food drive. The chart shows the number of cans collected by grade.

Grade	Number of Students	Total Cans Collected
1	20	100
2	24	96
3	22	99
4	30	120
5	18	90
6	30	150
7	22	132

Analyze the data as you use it and determine which class should win a prize. Show any calculations that you made and justify your choice.

Extend

12. ✓ **Competency Check** A set of five distinct natural numbers has a mean of 8 and a median of 6. What is the largest possible number in the set? Explain your thinking.

13. Mia records the number of free throws she made out of ten attempts during each basketball practice:
6, 6, 5, 7, 4, 8, 6, 6, 7, 8.

a) What are the median, mode, and mean?

b) In your opinion, does one measure of central tendency best describe the data?

c) How many successful free throws do you think Mia will make at tomorrow's practice? Explain your thinking.

d) Explain why these measures of central tendency might not be meaningful in this case.

14. The mean of four natural numbers is 28. If there is only one mode, what is a possible set of numbers?

15. Zack has five major tests in geography, all marked out of 50. His scores for the first four tests are 35, 42, 38, and 44.

a) What is Zack's current average test score?

b) What score must Zack get on the last test to raise his average score to 80%? Explain how you know.

16. A set of four whole numbers has a mode of 7. The smallest number is 2. The mean is 8. What are the four numbers?