# Changing the Score

Let's keep increasing or decreasing an amount by a percentage.

## 15.1 Math Talk: Rewriting Expressions

Express mentally each percent change using an expression that uses only multiplication.

- $x$ increased by 5%
- $y$ decreased by 10%
- $z$ increased by 25%
- $w$ decreased by 2.5%

# 15.2 Your New Score

Round 1: Your starting score is 50. Roll your number cube 10 times. If you are in group:

- A, your score increases by 5% every time you roll a 4, 5, or 6 (and stays the same otherwise).
- B, your score increases by 10% every time you roll a 5 or a 6 (and stays the same otherwise).
- C, your score increases by 20% every time you roll a 6 (and stays the same otherwise).

Compute your new score after each roll.

| roll | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| calculation | | | | | | | | | | | |
| new score | 50 | | | | | | | | | | |

Round 2: Your starting score is the result from Round 1. Roll your number cube 10 times. If you are in group:

- A, your score decreases by 5% every time you roll a 6 (and stays the same otherwise).
- B, your score decreases by 10% every time you roll a 5 or a 6 (and stays the same otherwise).
- C, your score decreases by 20% every time you roll a 4, 5, or 6 (and stays the same otherwise).

Compute your new score after each roll.

| roll | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| calculation | | | | | | | | | | | |
| new score | | | | | | | | | | | |

# 15.3 Bad Assumptions

1. Mai started with 100 and increased her score by 10% for each successful roll. She had 2 successful rolls.
   a. Mai thinks her score is 120. Explain why this is incorrect.

   b. What is Mai's correct score?

2. Han started with 100 points and lost 10% for each successful roll. He had 2 successful rolls.
   a. Han thinks his score is 80. Explain why this is incorrect.

   b. What is Han's correct score?

3. Suppose you have 100 points. Would you rather be in a group that gets a 5% increase per successful roll and makes 4 successful rolls, or in a group that gets a 10% increase per successful roll and makes 2 successful rolls?