

# Creating and Solving Equations: Day 1

## Unit 1: Extending the Number System

1. Hoopeston Sports Boosters invest \$3000 in hoodies to show support for the football team.
  - A. Write an equation that will model the profit,  $p$ , from selling  $n$  hoodies at \$25 each.

- B. How many hoodies will the Boosters have to sell to match their investment?

2. Hoopeston Music Boosters invest \$1000 in creating calendars.
  - A. Write an equation that will model the profit,  $p$ , from selling  $n$  calendars at \$20 each.

- B. How much profit will the Boosters make off selling 365 calendars?

3. Mr. Elliot's class is studying bacteria cultures from around the community. After swabbing some samples and doing some investigation they figure out that a certain bacteria that they collected will triple in size every 20 minutes.

- A. If the class collected just 30 micrometers of the bacteria, write an equation that will show the population,  $p$ , of the bacteria after  $t$  hours.

- B. How many micrometers of the bacteria will they have in the classroom after just 7 hours?

4. The physicians at Carle tell you that you have an infection growing from a cold you've had for a while. When first diagnosed your bacteria level was 250,000 micrometers and you were prescribed some medication.

A. If the medication cuts the level of bacteria in half every 3 hours, write an equation showing the level of bacteria,  $L(t)$ , after  $t$  hours.

B. Will your body be free from the bacteria after one day? If not, what level of the bacteria is still in your body?

5. The height of an object thrown or dropped can be found by plugging into the equation

$$h(t) = -16t^2 + v_0t + h_0$$

A. Write the equation that would model the height of a ball,  $h(t)$ , if it is thrown from an initial height of 6 feet with velocity of 50 feet per second.

B. Will the ball hit the ground after 3 seconds? If not, what will the height of the ball be at that point?

6. The height of an object thrown or dropped can be found by plugging into the equation

$$h(t) = -16t^2 + v_0t + h_0$$

A. Write the equation that would model the height of an egg,  $h(t)$ , if it is dropped from the top of the Willis Tower in Chicago which is 1729 feet tall.

B. How long will it take for the egg to hit the ground?