

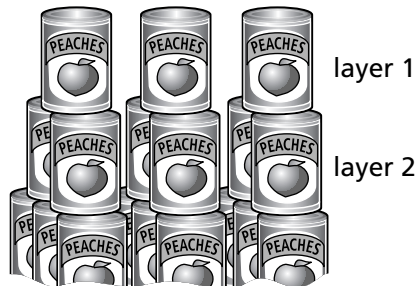
Additional Practice

Investigation 2

Growing, Growing, Growing

1. A bathtub is being filled at a rate of 2.5 gallons per minute. The bathtub will hold 20 gallons of water.
- How long will it take to fill the bathtub?
 - Is the relationship described linear, inverse, exponential, or neither? Write an equation relating the variables.
2. Suppose a single bacterium lands on one of your teeth and starts reproducing by a factor of 4 every hour.
- After how many hours will there be at least 1,000,000 bacteria in the new colony?
 - Is the relationship described linear, inverse, exponential, or neither? Write an equation relating the variables.

3. Two students who work in a grocery store are making a display of canned goods. They build a tower of cans 12 layers deep. The first layer, at the top, contains three cans in a row. The second layer contains six cans, in two rows of three that support the first layer. The third layer has nine cans, in three rows of three that support the second layer.



- How many cans are in layer 12, the bottom layer?
- Is the relationship described linear, inverse, exponential, or neither? Write an equation relating the variables.

Additional Practice *(continued)***Investigation 2****Growing, Growing, Growing**

4. An experimental plant has an unusual growth pattern. On each day, the plant doubles its height of the previous day. On the first day of the experiment, the plant grows to twice, or 2 times, its original height. On the second day, the plant grows to 4 times its original height. On the third day, the plant grows to 8 times its original height.
- How many times its original height does the plant reach on the sixth day?
On the n th day?
 - If the plant is 128 cm tall on the ninth day, how tall was it just before the experiment began?
 - Is the relationship described linear, inverse, exponential, or neither? Write an equation relating the variables.

Study the pattern in each table. Tell whether the relationship between x and y is linear, inverse, exponential, or neither, and explain your reasoning. If the relationship is linear, inverse, or exponential, write an equation for it.

5.

| | | | | | | |
|-----|---|---|----|----|----|----|
| x | 0 | 1 | 2 | 3 | 4 | 5 |
| y | 2 | 9 | 16 | 23 | 30 | 37 |

6.

| | | | | | | |
|-----|---|---|---|----|----|----|
| x | 0 | 1 | 2 | 3 | 4 | 5 |
| y | 2 | 4 | 8 | 16 | 32 | 64 |

7.

| | | | | | | |
|-----|----------------|---------------|---|---|----|----|
| x | 0 | 1 | 2 | 3 | 4 | 5 |
| y | $\frac{1}{16}$ | $\frac{1}{4}$ | 1 | 4 | 16 | 64 |

8.

| | | | | | | |
|-----|---|---------------|---------------|---------------|---------------|---------------|
| x | 0 | 1 | 2 | 3 | 4 | 5 |
| y | 1 | $\frac{1}{2}$ | $\frac{1}{3}$ | $\frac{1}{4}$ | $\frac{1}{5}$ | $\frac{1}{6}$ |

9.

| | | | | | | |
|-----|---|----|-----|-----|-------|--------|
| x | 0 | 1 | 2 | 3 | 4 | 5 |
| y | 1 | 14 | 116 | 614 | 2,156 | 10,124 |