3.1 Using Exponents to Describe Numbers

MathLinks 9, **pages 92–98**

Key Ideas Review

Choose from the following terms to complete #1.

base	exponent	multiplication	power

1. **a)** A _____ is a short way to express repeated

   _____.

   b) In a power, the _____ represents the number of times you

   multiply the _____.

Check Your Understanding

2. Write each expression as a power.
   Then, evaluate.

   a) $3 \times 3 \times 3 \times 3$

   b) $(-5) \times (-5) \times (-5)$

   c) $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

3. Write each expression as a power and
   evaluate.

   a) $4 \times 4 \times 4$

   b) $(-7) \times (-7) \times (-7) \times (-7)$

   c) $8 \times 8 \times 8$

4. Rewrite each exponential form as
   repeated multiplication, then evaluate.

   a) 6^3

   b) $(-10)^5$

   c) -4^4

5. Show each value as repeated
   multiplication and in exponential form.

   a) 81

   b) 256

6. What alternative answers can you
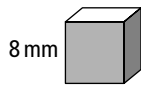   suggest for #5?

7. Evaluate each power.

   a) 4^5

   b) $(-5)^4$

   c) -8^2

8. Does $-3^6 = (-3)^6$? Explain how you know.
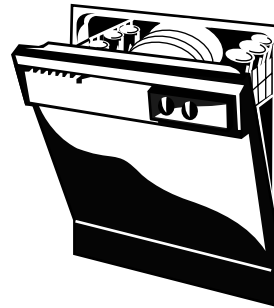
9. Write the volume of the cube in exponential form. Then, evaluate.

8 mm

10. Arrange the powers from greatest to least value: 5^2, 4^3, 3^4, 2^5. Show your thinking.

11. Explain why 45 cannot be expressed as a power in the form y^x.

12. Michelle will load and unload the dishwasher every day of the week. In return, her parents will pay her 2¢ for the first week, and twice as much as the previous week for each week thereafter. Use the expression 2^w to determine her weekly rate of pay, where w represents the number of weeks. How much will she earn, in dollars, in week 7, week 15, week 25, and week 30?

13. The volume of a cube with an edge length of 9 cm is 729 cm³. Write the volume in repeated multiplication form and exponential form.

9 cm