



**O**n previous pages, we learned how to work with exponents, including zero and negative exponents. In this activity, you will begin to investigate exponent rules so that you can work with more exponential expressions.

- Let's think about the amount of information available on the WWW. Let's say that the amount available now is 1 web unit, or 1 wu. Assuming the information doubles every year, how much information will be available in ...
  - one year? \_\_\_\_\_
  - two years? \_\_\_\_\_
  - three years? \_\_\_\_\_
  - zero years? \_\_\_\_\_
  - one year ago? \_\_\_\_\_
  - two years ago? \_\_\_\_\_
- Suppose the information triples every year, how much information will be available ...
  - 1 year from now?  $\frac{3^1}{}$
  - 4 years from then?  $\frac{3^1 \cdot 3^4}{} = (3) \cdot (3 \cdot 3 \cdot 3 \cdot 3) = 3^{\square}$
  - 1 year from now and 4 years from then means \_\_\_\_\_ years from now or  $3^{\square}$
- Suppose the amount of information available on the web is 5 times as much every year. How much information will be available ...
  - 4 years from now? \_\_\_\_\_
  - 7 years from then? \_\_\_\_\_ = \_\_\_\_\_ = 5  $\square$
  - 4 years from now and 7 years from then means \_\_\_\_\_ years from now or  $5^{\square}$
- What is a shortcut for doing problems like these? Explain.



### Products of Two Powers Rule- (Part of Skill 12)

When multiplying two powers with the same base, keep the base and add the exponents.

$$b^m \cdot b^n = b^{m+n}$$

- Use exponent rules to simplify and write each expression with one positive exponent.
  - $2^{10} \cdot 2^5 =$
  - $3^{16} \cdot 3^4 =$
  - $10^{12} \cdot 10^3 =$
  - $6^7 \cdot 6^{-4} =$
  - $x^8 \cdot x^3 =$
  - $p^0 \cdot p^{-3} =$
  - $y^2 \cdot y^3 =$
  - $5^{16} \cdot 5^{-16} =$
  - $c^{-8} \cdot c^3 =$
  - $4^7 \cdot 4^0 =$
  - $m^4 \cdot m^{-10} =$
  - $u^{-3} \cdot u^{-5} =$

**Practice 7-2**

Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_

Simplify, leaving your answer in exponent form, with only positive exponents.

1)  $4^2 \cdot 4^2$

2)  $4 \cdot 4^2$

3)  $3^2 \cdot 3^2$

4)  $2 \cdot 2^2 \cdot 2^2$

5)  $2n^4 \cdot 5n^4$

6)  $6r \cdot 5r^2$

7)  $2n^4 \cdot 6n^4$

8)  $6k^2 \cdot k$

9)  $5b^2 \cdot 8b$

10)  $4x^2 \cdot 3x$

11)  $6x \cdot 2x^2$

12)  $6x \cdot 6x^3$

$$13) 7v^3 \cdot 10u^3v^5 \cdot 8uv^3$$

$$14) 9xy^2 \cdot 9x^5y^2$$

$$15) 6m^3n^3 \cdot 8m^2n^3$$

$$16) 6x^2 \cdot 6x^3y^4$$

$$17) 7u^2v^5 \cdot 9uv^3$$

$$18) uv \cdot 4uv^5$$

$$19) 10xy^3 \cdot 8x^5y^3$$

$$20) 3u^4v^5 \cdot 7u^2v^3$$

$$21) (2x^2)^2$$

$$22) (p^4)^4$$

$$23) (k^3)^4$$

$$24) (7k)^2$$

$$25) (x^2)^3$$

$$26) (2b^2)^4$$

Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_

## Scientific Notation

**Write each number in scientific notation.**

1) 0.000000786

2) 3940

3) 4.7

4) 1260000

5) 0.06

6) 175

**Write each number in standard notation.**

7)  $6.17 \times 10^3$

8)  $7 \times 10^4$

9)  $7.31 \times 10^6$

10)  $5.4 \times 10^{-8}$

11)  $6.7 \times 10^{-3}$

12)  $9.59 \times 10^2$

**Write each number in scientific notation.**

13)  $0.2 \times 10^6$

14)  $30 \times 10^{-8}$

15)  $88.4 \times 10^3$

16)  $28.8 \times 10^{-9}$

**Simplify. Write each answer in scientific notation.**

17)  $(5.4 \times 10^{-1})(7 \times 10^0)$

18)  $(5 \times 10^3)(3.5 \times 10^{-1})$

19)  $(6 \times 10^6)(4 \times 10^{-1})$

20)  $(4.11 \times 10^5)(8.65 \times 10^{-5})$

21)  $(7.68 \times 10^2)(9 \times 10^6)$

22)  $(8.31 \times 10^{-3})(6.6 \times 10^{-6})$