

# Exponents

base  $\longrightarrow$   $5^4$   $\longleftarrow$  exponent

The number 5 is the **base**. The base is the factor that is being multiplied.

The number 4 is the **exponent**. The exponent tells how many times the base is used as a factor.

$$5^4 = 5 \times 5 \times 5 \times 5 = 625$$

The base (5) is used as a factor the exponent (4) number of times.

To write a product in exponential form:

$$4 \times 4 \times 4 \times 4 \times 4 \times 4 \times 4$$

First write the base: **4**

Count the number of times the base is used as a factor. This is the exponent.  **$4^7$**

To evaluate an exponential number:  **$6^3$**

Write the base as a factor the number of times shown by the exponent.

$$6^3 = 6 \times 6 \times 6 = 216$$

To write the expanded form of a number using exponents:

Write the number in expanded form.

$$52,965 = (5 \times 10,000) + (2 \times 1,000) + (9 \times 100) + (6 \times 10) + (5 \times 1)$$

Write the place values as powers of 10.

$$52,965 = (5 \times 10^4) + (2 \times 10^3) + (9 \times 10^2) + (6 \times 10^1) + (5 \times 10^0)$$

**Tip:** Any number raised to the first power equals that number.  **$8^1 = 8$**

Write each power as a product and evaluate the expression.

1.  $9^4$  \_\_\_\_\_      2.  $4^5$  \_\_\_\_\_

Write each product in exponential form.

3.  $3 \times 3 \times 3 \times 3 \times 3$  \_\_\_\_\_      4.  $7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7$  \_\_\_\_\_

Write the number in expanded form using exponents.

5.  $74,271 =$  \_\_\_\_\_  $+$  \_\_\_\_\_  $+$  \_\_\_\_\_  $+$  \_\_\_\_\_  $+$  \_\_\_\_\_

6. **Number Sense** Explain the difference between  $4^6$  and  $6^4$ .

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