EXAMPLE 4 — Evaluate powers

Evaluate the expression.

   a. x^4 when $x = 2$ **b.** n^3 when $n = 1.5$

Solution

a. $x^4 = 2^4$

     $= 2 \cdot 2 \cdot 2 \cdot 2$

     $= 16$

b. $n^3 = 1.5^3$

     $= (1.5)(1.5)(1.5)$

     $= 3.375$

✓ **GUIDED PRACTICE**   **for Example 4**

Evaluate the expression.

  9. x^3 when $x = 8$ **10.** k^2 when $k = 2.5$ **11.** d^4 when $d = \frac{1}{3}$

AREA AND VOLUME Exponents are used in the formulas for the area of a square and the volume of a cube. In fact, the words *squared* and *cubed* come from the formula for the area of a square and the formula for the volume of a cube.

$A = s^2$ $V = s^3$
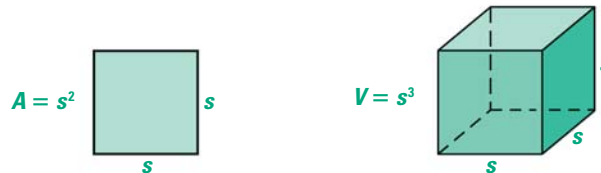
EXAMPLE 5 — Evaluate a power

STORAGE CUBES Each edge of the medium-sized pop-up storage cube shown is 14 inches long. The storage cube is made so that it can be folded flat when not in use. Find the volume of the storage cube.

Solution

$V = s^3$ **Write formula for volume.**

$ = 14^3$ **Substitute 14 for s.**

$ = 2744$ **Evaluate power.**

▶ The volume of the storage cube is 2744 cubic inches.

✓ **GUIDED PRACTICE**   **for Example 5**

12. WHAT IF? In Example 5, suppose the storage cube is folded flat to form a square. Find the area of the square.