

Powers of Ten Tell the Scale

Name: _____

Date: _____

Preserve the product. $0.0063 = 6.3 \times 10^{-3}$. Since $10^{-3} = \frac{1}{1000}$, the value is positive. Also 63×10^{-4} has the same value, but its coefficient is not normalized.

Explore and explain

1. Write 0.00072 and 5,300,000 in normalized scientific notation.

2. Compare 6.2×10^4 and 7.1×10^3 . Explain why comparing only 6.2 and 7.1 fails.

3. A student writes $3.5 \times 10^{-2} = -0.035$. Explain the error and give the correct value.

Think Like a Mathematician

Optional extension. Choose a strategy and justify why it works. Try a diagram, organized cases, a simpler example, or an equation.

7. Find the integer n such that 4.8×10^n is 1,000 times as large as 0.048. Justify by rewriting both quantities as powers of ten.

8. Two positive numbers are in normalized scientific notation: $A = 9.6 \times 10^p$ and $B = 1.2 \times 10^q$. If $A/B = 800$, find $p - q$. Must A have the larger exponent? Explain.