Name_____

Scientific Notation

Scientists very often deal with very small and very large numbers, which can lead to a lot of confusion when counting zeros. We can express these numbers as powers of 10 so they are easier to read and understand.

Scientific notation takes the form of $M \times 10^n$ where $1 \leq M <$ and n represents the number of decimal places to be moved. Positive n indicates the standard form is larger than zero, whereas negative n would indicate a number smaller than zero.

Example: Convert 1,500,000 to scientific notation.

Move the decimal point so that there is only one digit to its left, a total of 6 places.

$$1{,}500{,}000 = 1.5 \times 10^6$$

Example: Convert 0.00025 to scientific notation.

Move the decimal point 4 places to the right.

$$0.00025 = 2.5 \times 10^{-4}$$

(Note that when a number starts out less than one, the exponent is always negative.)

Convert each number to scientific notation.

1. 0.005 = _____
2. 5,050 = _____
3. 0.0008 = _____
4. 1,000 = _____
5. 1,000,000 = _____
6. 0.25 = _____
7. 0.025 = _____
8. 0.0025 = _____
9. 500 = _____
10. 5,000 = _____

Convert each number to standard notation.

11. 1.5×10^3 = _____
12. 1.5×10^{-3} = _____
13. 3.75×10^{-2} = _____
14. 3.75×10^2 = _____
15. 2.2×10^5 = _____
16. 3.35×10^{-1} = _____
17. 1.2×10^{-4} = _____
18. 1×10^4 = _____
19. 1×10^{-1} = _____
20. 4×10^0 = _____