

Scientific notation is the universal way of writing very large or very small numbers in a more simple, compact form. Scientific notation utilizes powers of ten to simplify numbers. For example, 7,500,000,000 is written as  $7.5 \times 10^9$ . Another example: 0.0000000005 is written as  $5 \times 10^{-11}$ . An easy way to determine the exponent is to count the number of times the decimal must be moved to give you a stem number between one and ten. If the decimal is moved to the left the exponent is positive, and if it is moved to the right the exponent is negative. The image below shows how to move the decimal and keep track of your exponent for the two examples above.

## Concept Definition

Study the primary definition of this concept, broken into general, basic, and advanced English definitions. Also see the mathematical definition and any requisite background information, such as conditions or previous definitions.

### Basic

A simplified way of writing very large or very small numbers. Small numbers are usually between 0 and 1 or 0 and -1 and include many zeros after the decimal point. An example of a small number is 0.0000058 ( $5.8 \times 10^{-6}$ ).

### Advanced

A simplified expression for a large number or small using powers of ten. Small numbers have negative exponents while large numbers have positive exponents.

## Mathematical Definition

$$a \cdot 10^b$$

a is the **stem**. The stem is always between 1 and 10.

10 is always the **base**.

b is the **exponent** and is negative for small numbers and positive for large numbers.

## Vocabulary

Learn important vocabulary for this concept, including words that might appear in assessments (tests, quizzes, homework, etc.) that indicate the use of this concept.

Important Vocabulary	Term	Context
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## Computer Animations

Experience computer simulators or animations that illustrate the concept discussed here. Many simulators or animations come with worksheets for use in class.

<http://janus.astro.umd.edu/astro/scinote/>

<http://www.xpmath.com/forums/arcade.php?do=play&gameid=21>

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