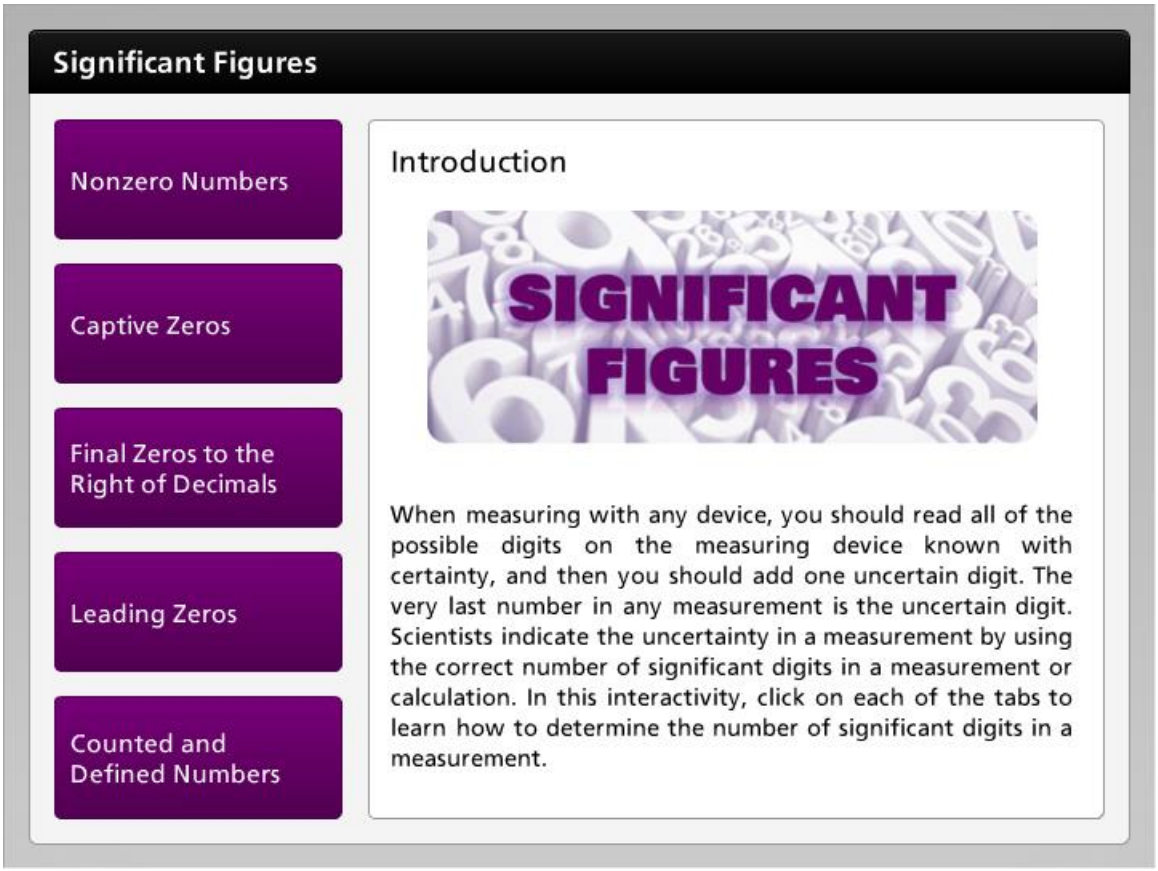
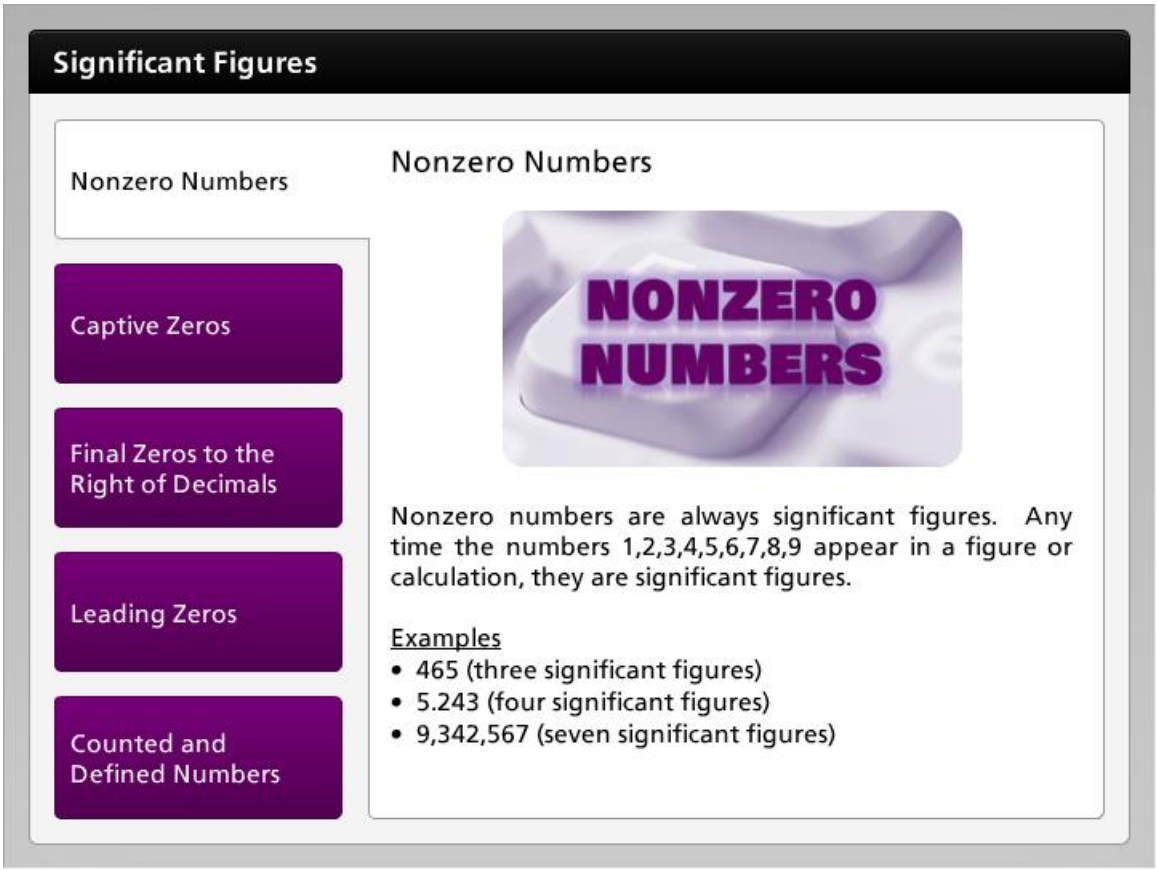
Introductory Module: Fundamentals of Science
Topic 3 Content: Significant Figures Presentation Notes

Introduction



When measuring with any device, you should read all of the possible digits on the measuring device known with certainty, and then you should add one uncertain digit. The very last number in any measurement is the uncertain digit. Scientists indicate the uncertainty in a measurement by using the correct number of significant digits in a measurement or calculation. In this interactivity, click on each of the tabs to learn how to determine the number of significant digits in a measurement.

Nonzero Numbers

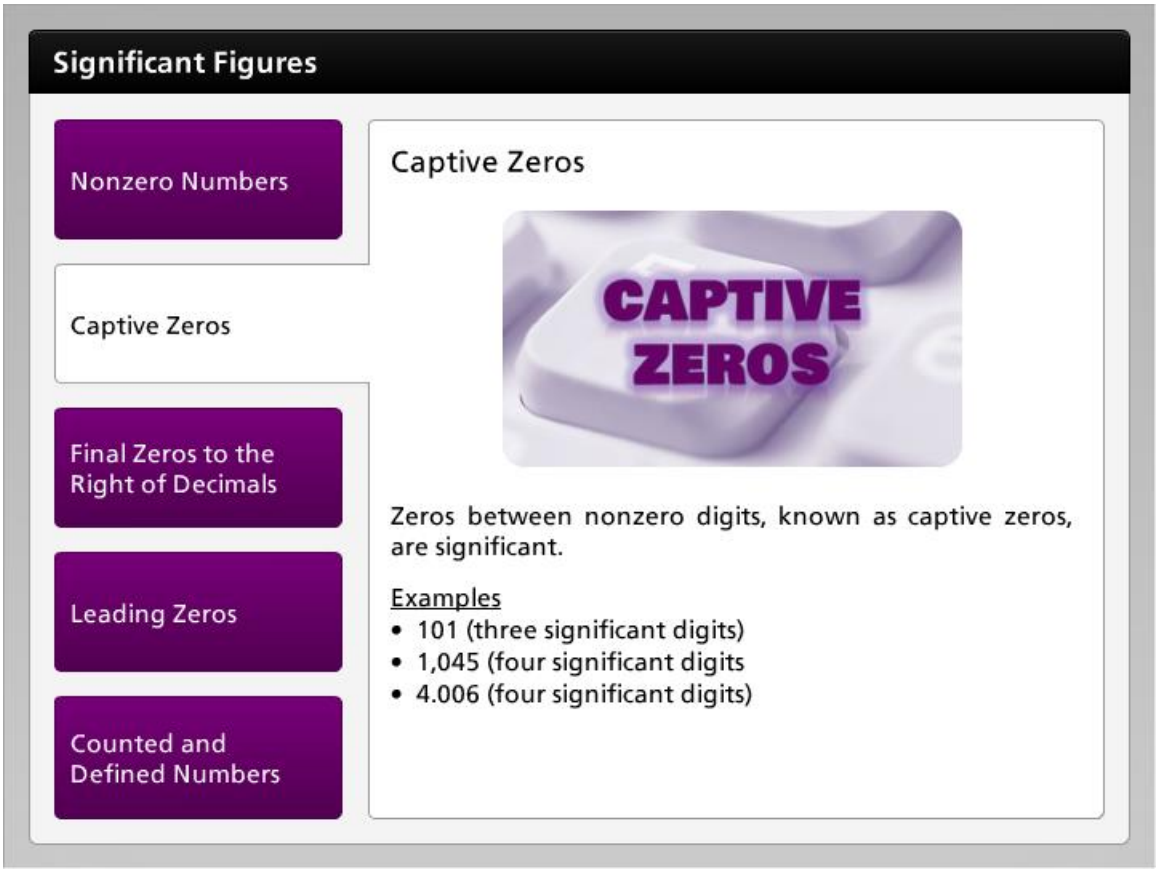


Nonzero numbers are always significant figures. Any time the numbers 1,2,3,4,5,6,7,8,9 appear in a figure or calculation, they are significant figures.

Examples

- 465 (three significant figures)
- 5.243 (four significant figures)
- 9,342,567 (seven significant figures)

Captive Zeros

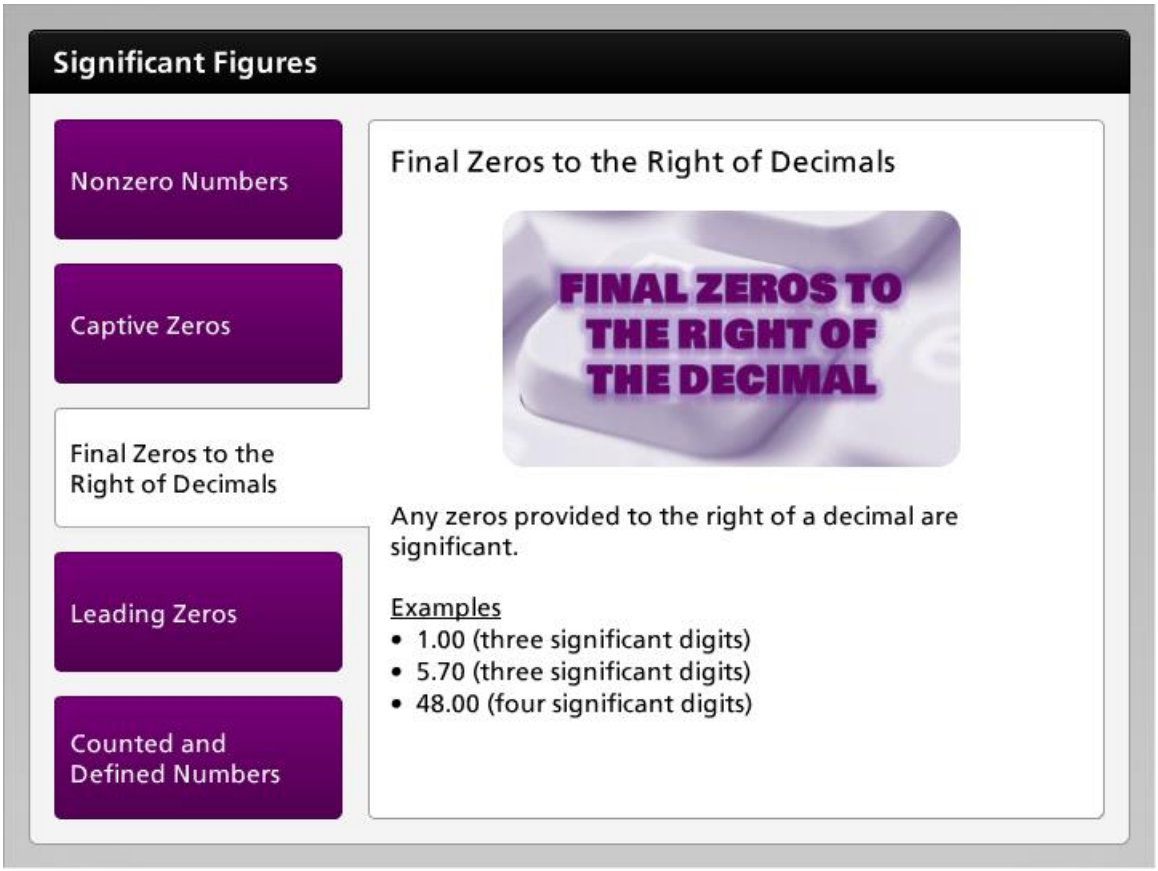


Zeros between nonzero digits, known as captive zeros, are significant.

Examples

- 101 (three significant digits)
- 1,045 (four significant digits
- 4.006 (four significant digits)

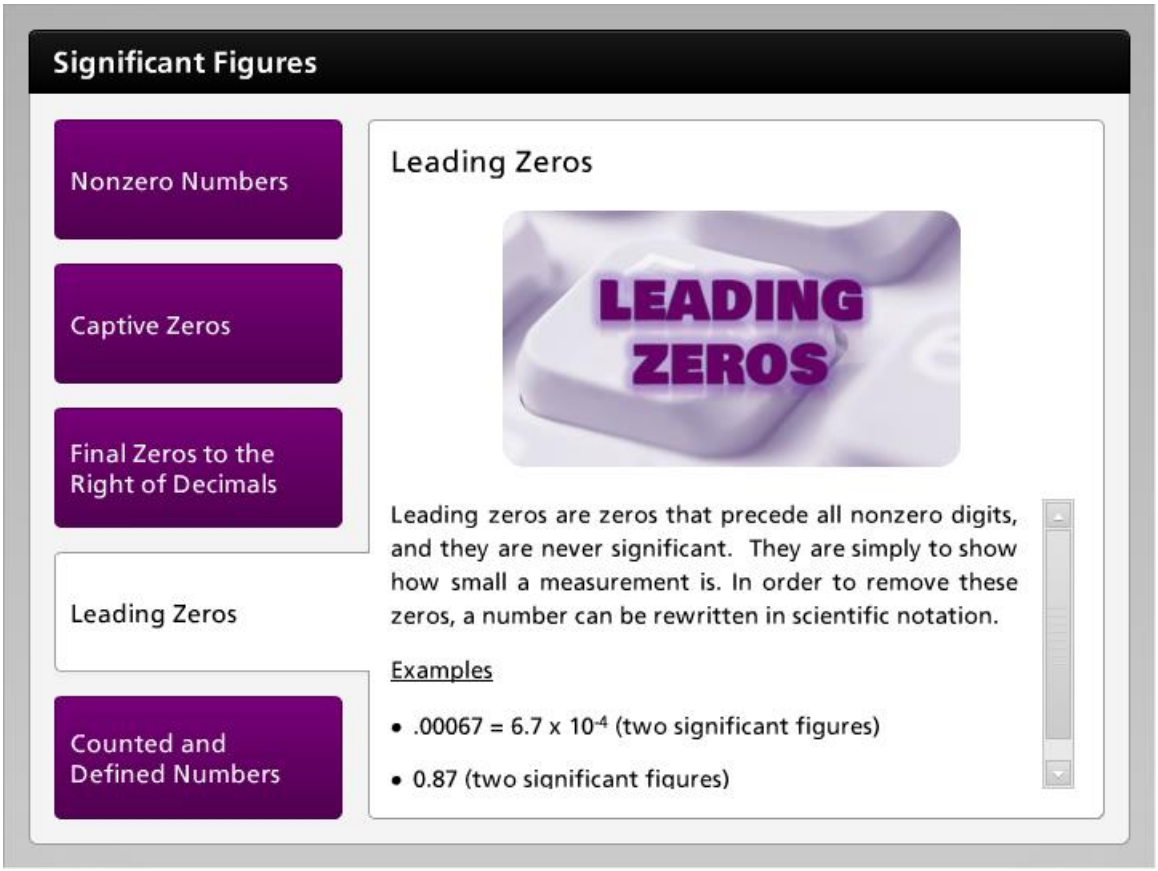
Final Zeros to the Right of Decimals



Any zeros provided to the right of a decimal are significant.

Examples
- 1.00 (three significant digits)
- 5.70 (three significant digits)
- 48.00 (four significant digits)

Leading Zeros

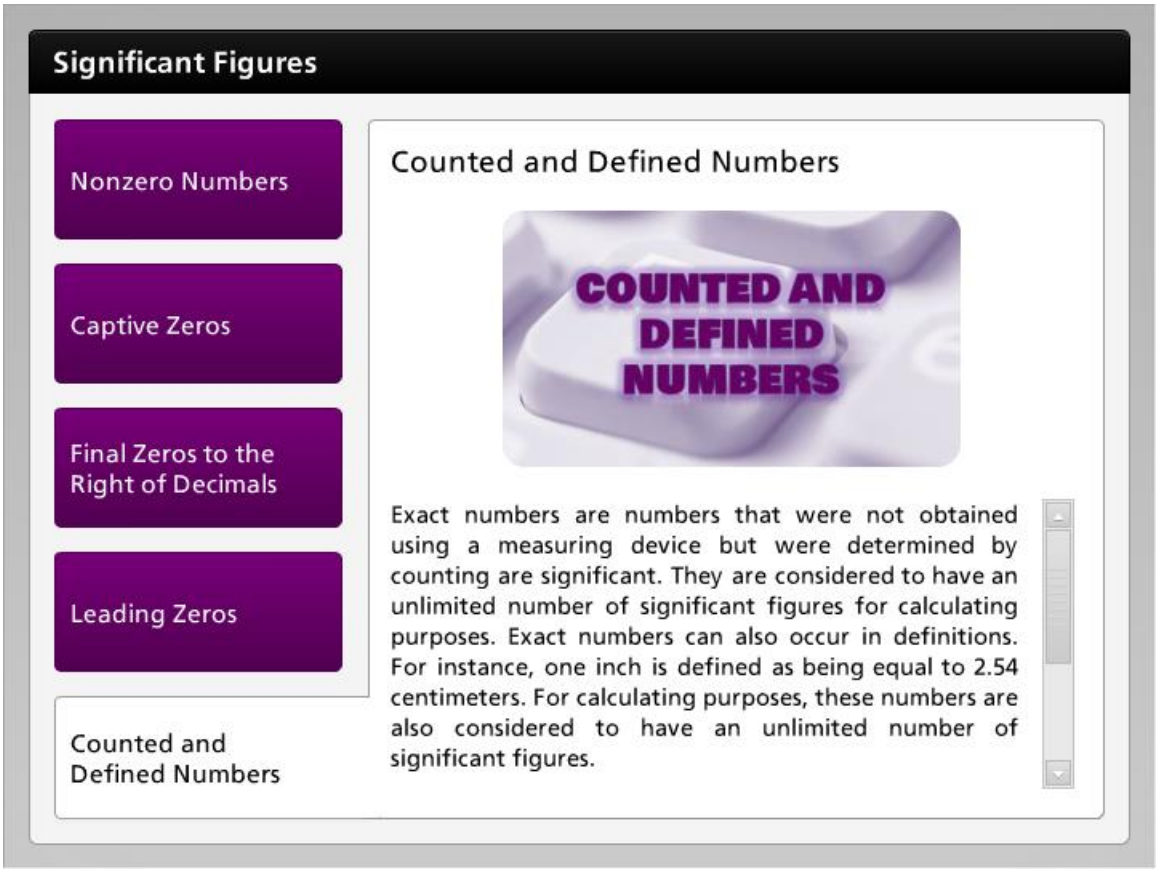


Leading zeros are zeros that precede all nonzero digits, and they are never significant. They are simply to show how small a measurement is. In order to remove these zeros, a number can be rewritten in scientific notation.

Examples

- $.00067 = 6.7 \times 10^{-4}$ (two significant figures)
- 0.87 (two significant figures)

Counted and Defined Numbers



Exact numbers are numbers that were not obtained using a measuring device but were determined by counting are significant. They are considered to have an unlimited number of significant figures for calculating purposes. Exact numbers can also occur in definitions. For instance, one inch is defined as being equal to 2.54 centimeters. For calculating purposes, these numbers are also considered to have an unlimited number of significant figures.

<u>Examples</u>
Each of these numbers has an unlimited number of significant figures:

- 2 school buses
- 1 foot = 12 inches
- 14 desks