Significant Digits

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Significant digits ***measure***, as opposed to some zeroes that are merely place-holders. Specifically:

A. One or more zeroes between non-zero digits *are* significant, because the assumption is that measurement was conducted at those places, and the measurement happened to be zero.

B. Zeroes between non-zero digits and the end of a whole number *are not* considered significant, because estimation or roundoff may have been involved.

C. Zeroes between non-zero whole-number places and a written decimal point *are* considered significant. Use of a decimal point at the end of a whole number indicates significant zeroes.

D. Zeroes between a decimal point and non-zero decimal digits are not significant, *unless* there are non-zero digits to the left of the decimal point.

E. One or more zeroes to the right of non-zero decimal digits are considered significant, which is why decimal rounding-off is so touchy.

A general principle for identifying *non*-significant zeroes:

> *non-significant zeroes would disappear if there were a more judicious choice of a measuring unit.*

For example, non-significant zeroes will probably appear if one attempts to measure the distance from Kansas City to St. Louis in millimeters.

Also, non-significant zeroes will appear if one attempts to measure the thickness of a fingernail in kilometers.

Further instructive examples are listed here:

Example	Significant digits
357	3
35700	3
35700.	5
3057	4
305,007,000	6
.357	3
.00357	3
.003057	4
.003570	4
.0000350700	6
20.00357	7

Significant digits are important in measurement (including accuracy and precision), and in rounding.