

WKS
Significant Digits
 (Significant Figures)

Name **KEY**
 Date _____
 Period _____

Part A: Determining the number of significant digits in a measurement:

1. Digits other than zero are always significant.

- Ex: 96 g 2 sig figs
 Ex: 61.4 g 3 sig figs
 Ex: 1.5345 5 sig figs

2. One or more final zeros used after the decimal point are always significant.

- Ex: 4.70 L 3 sig figs
 Ex: 576.980 L 6 sig figs
 Ex: 45.9000 L 6 sig figs

When there is a decimal, trailing zeros ARE significant .

3. Zeros between other digits are always significant.

- Ex: 5.089 mL 4 sig figs
 Ex: 80017 mL 5 sig figs
 Ex: 480.020 mL 6 sig figs

4. For numbers less than 1, all **zeros at the beginning** are insignificant until one hits a digit other than 0.

- Ex: 0.0052 cm 2 sig figs
 Ex: 0.0306 cm 3 sig figs
 Ex: 0.00400 cm 3 sig figs

When there is a decimal, leading zeros are NOT significant.

5. **Unclear number of significant digits:** When a measurement ends with one or more zeros which are not after the decimal point, the number of significant digits is unclear. In these cases, one could clarify the precision by writing the measurement in scientific notation.

- Ex: 3870 m 3 sig figs (at least), but could be 4 sig figs
 Is it 3.87×10^3 or 3.870×10^3 ?

- Ex: 500 m 1 sig fig (at least), but could be 2 sig figs or 3 sig figs
 Is it 5×10^2 or 5.0×10^2 or 5.00×10^2 ?

When there is NO decimal, trailing zeros are ambiguous. Thus, one generally must assume that they are NOT significant.

Part A Practice: Determine the number of significant digits for the following measurements. If the number of significant digits is unclear, write “unclear” and list all the possible number of significant digits it could have. For example: 4050 L unclear, 3 or 4 possible Also, convert each of the measurements to scientific notation.

	<u># of sig figs</u>	<u>Write number in Scientific Notation</u>
1) 678 g	3	6.78×10^2 g
2) 4.098 mm	4	4.098×10^0 mm
3) 0.0089 s	2	8.9×10^{-3} s
4) 0.07608 mL	4	7.608×10^{-2} mL
5) 5098 cm	4	5.098×10^3 cm
6) 57.0010 min	6	5.70010×10^1 min
7) 63100 km	3,4,5	6.31×10^4 km; 6.310×10^4 km; 6.3100×10^4 km
8) 0.000001 pm	1	1×10^{-6} pm
9) 600.0200 g	7	6.0000200×10^2 g
10) 20 m	1,2	2×10^1 m; 2.0×10^1 m

