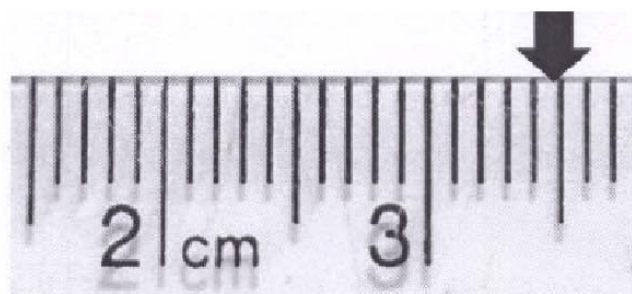


## Worksheet 1

Any measurement made is inaccurate to some degree. This can come from many factors such as human or instrumental error. In science, the uncertainty of this error is just as important as the actual measurement, and using the rules of significant figures conveys this error.

Significant figures in a measurement include all the digits that are precisely known, plus one that is estimated.

1. For example, consider the following ruler (in cm):



- What is the value represented by the above arrow? \_\_\_\_\_
- Which digits are precisely known? \_\_\_\_\_
- Which digit is estimated? \_\_\_\_\_
- How many significant figures are in this value? \_\_\_\_\_

2. How many significant figures are in each of the following:

- 203.5 g
- 0.0325 cm
- $2.0 \times 10^2$  m
- 200 kg
- 0.007400 nm
- 350.0 mL

3. Express each answer in the correct units with the correct number of significant figures.

- $1.346 \text{ m} + 0.3 \text{ m} + 4.78 \text{ m}$
- $8.25 \text{ g} - 6.3312 \text{ g}$
- $(1.20 \text{ cm})(4.6666 \text{ cm})$
- $2.1 \text{ kg} \div 9.35 \text{ kg}$

4. Use the table below to convert the following using correct significant figures:

Prefix	Symbol	Multiplier
Tera-	T	$10^{12}$ (i.e., $1 \text{ Tm} = 1 \times 10^{12} \text{ m}$ )
Giga-	G	$10^9$
Mega-	M	$10^6$
Kilo-	k	$10^3$
Hecto-	h	$10^2$
Deca-	da	$10^1$

Deci-	d	$10^{-1}$
Centi-	c	$10^{-2}$
Milli-	m	$10^{-3}$
Micro-	$\mu$	$10^{-6}$
Nano-	n	$10^{-9}$
Pico-	p	$10^{-12}$

a) 31.0 m to decimeters

b) 54.3 mg to kilograms

c) 870 mL to liters

d) 5.6 kg/m<sup>3</sup> to g/cm<sup>3</sup>

5. Lithium is the least dense metal known (density = 0.53 g/cm<sup>3</sup>). What is the volume occupied by  $1.20 \times 10^3$  grams of lithium?

6. A block of iron (density = 7.9 g/cm<sup>3</sup>) has dimensions of 21 mm x 15 mm x 18 mm. How many grams are in this block?