

Important Rules for using Significant Figures

1. The number of Significant Figures you can report will depend on the instrument you used to take the measurement! “All of the digits known for certain, and one that is a guess” are considered significant.



One ‘correct’ reading is:

41.63 cm

The last digit is a guess!

2. All nonzero digits are significant.
87.31g has 4 sigfigs
3. All zeroes between two significant figures are significant.
2006 feet has 4 sigfigs.
4. Zeros to the right of a nonzero digit but to the left of an understood decimal place are **not significant** unless specifically indicated.
6200 meters has 2 sigfigs.
5. All zeros to the right of a decimal point, but to the left of the first nonzero digit **are not significant**. So, if the measurement is
0.000061 kg has 2 sigfigs.
6. Any zeroes to the right of the decimal point and right of the last nonzero digit **are significant**.

0.0780 cm has 3 sigfigs.

Placeholders are not significant!

This zero is significant

7. When adding or subtracting: your answer **cannot be more precise than the least precise piece of data**.

$$\begin{array}{r}
 4.8 \\
 - 3.965 \\
 \hline
 0.835 = 0.8
 \end{array}$$

8. When multiplying or dividing the answer should have the **same number of significant digits as the least precise data**.

$$3.216 \text{ m} \times 1.0 \text{ m} = 3.2 \text{ m}^2$$

4 sigfigs

2 sigfigs

Useful Conversions and Metric Prefixes

Time: 1 day = 24 hours 1 hour = 3600 seconds	Length: 1 in = 2.54 cm 1 m = 3.281 ft 1 mile = 1.609 km or (1 mile = 1609 m) 1 mile = 5280 ft 3 feet = 1 yard
Volume: $1 \text{ m}^3 = 35.32 \text{ ft}^3$ $1 \text{ liter} = 1000 \text{ cm}^3 = 1.0576 \text{ quarts}$ 4 quarts = 1 gallon $1 \text{ oz} = 2.95734 \times 10^{-5} \text{ m}^3$	Mass: 1 ton (metric) = 1000 kg 1 kg = 2.2 lbs 454 g = 1lb
Force: 1 N = 0.2248 lbs	Temperature: $T_c = (5/9) * (T_f - 32^\circ\text{F})$ $T_f = (9/5)*T_c + 32^\circ\text{F}$ $T_c = T_k - 273^\circ\text{C}$

Prefix:	Symbol:	Magnitude:	Meaning (multiply by):
Yotta-	Y	10^{24}	1 000 000 000 000 000 000 000 000
Zetta-	Z	10^{21}	1 000 000 000 000 000 000 000
Exa-	E	10^{18}	1 000 000 000 000 000 000
Peta-	P	10^{15}	1 000 000 000 000 000
Tera-	T	10^{12}	1 000 000 000 000
Giga-	G	10^9	1 000 000 000
Mega-	M	10^6	1 000 000
myria-	my	10^4	10 000 (this is now obsolete)
kilo-	k	10^3	1000
hecto-	h	10^2	100
deka-	da	10	10
-	-	-	-
deci-	d	10^{-1}	0.1
centi-	c	10^{-2}	0.01
milli-	m	10^{-3}	0.001
micro-	u (mu)	10^{-6}	0.000 001
nano-	n	10^{-9}	0.000 000 001
pico-	p	10^{-12}	0.000 000 000 001
femto-	f	10^{-15}	0.000 000 000 000 001
atto-	a	10^{-18}	0.000 000 000 000 000 001