Sig Figs

P

decimal is present

45 2 SFs

② ①

450 2 SFs

② ①

A

decimal is absent

① Once you hit a # between 1-9, you start Counting

② Do not stop counting until the end of the #.

P

4.53 3 SFs
1 2 3

A

4058 4 SFs
4 3 2 1

40580 4 SFs
4 3 2 1

450. 3 SFs
1 2 3

450.0 4 SFs
1 2 3 4

③ The decimal only tells which side to start at.

.003580

P 0.003580 4 sFs

1 2 3 4

A 0.003580 < 1

First # must be between 1 and 9 for scientific notation.

3.580×10^{-3} 4 sig figs

Place holders

1.072×10^{-3}

$-x < 1$

1.072×10^{3}

$x > 1$

1.072×10^{0}

$10^{0} = 1$

3.273×10^{-2}

0.03273

3.273 [EE / EXP] − 2

2 −

x10

(−)

(−/+)

4.735×10^4

47350

4.735 EE 4

EXP

4.756×10^{12}

4.756 EE 12

EXP

4.756 _ 12

X10

4.756 E 12

.001 kg	.001 kL	.001 km
1 g	1 L	1 m
10 dg	10 dL	10 dm
100 cg	100 cL	100 cm
1000 mg	1000 mL	1000 mm
1×10^6 μg	1×10^6 μL	1×10^6 μm
micro		
1×10^9 ng	1×10^9 nL	1×10^9 nm
nano		
1×10^{12} pg	1×10^{12} pL	1×10^{12} pm
pico		

1. A

"2.37 g" (3) "given"

$$\frac{2.37\ \text{g} \times 1000\ \text{mg}}{1\ \text{g}} = 2370\ \text{mg}$$ (3)

Changing from metric to metric will always give you the correct # of sig. figs.

1B

$$\frac{357\cancel{cL} \times 1\ L}{100\ \cancel{cL}} = 3.57\ L$$

IF 5.4×10^{-3} mL → cL

prefixes

$$\frac{5.4 \times 10^{-3}\ \text{mL} \times 1\ \text{L} \times 100\ \text{cL}}{1000\ \text{mL} \times 1\ \text{L}} =$$

5.4×10^{-4} cL

.00054 cL

✗ $\frac{5.4 \times 10^{-3}\ \text{mL} \times 100\ \text{cL}}{1\ \text{mL}} =$

✗ $\frac{5.4 \times 10^{-3}\ \text{mL} \times \text{kL}}{1000\ \text{mL}} =$

G 8.324×10^{12} nm $\xrightarrow{m}$ Km

$$\frac{8.324 \times 10^{12}\ \text{nm} \times 1\ \text{m} \times .001\ \text{Km}}{1 \times 10^{9}\ \text{nm} \times 1\ \text{m}} =$$

$$8.324\ \text{Km}$$

Sig figs ∞

references (book)

454g = 1lb

1m = 1000mm

π

counting

1. I $.05\,kg \xrightarrow{g} mg$

$$\frac{0.05kg \times 1\,g \times 1000mg}{.001kg \times 1\,g} =$$

50000 mg 5×10^4 mg

~~5000 mg~~

1c. $2.0\,m \longrightarrow nm$

$$\frac{2.0\,m \times (1 \times 10^{9}\,nm)}{1\,m} =$$

$$2.0 \times 10^{9}\,nm$$

Volume

2. a $9.5\ gal \longrightarrow mL$

↑ english ↑ metric

✓ $4\ qt = 1\ gal$

✓ $1\ qt = 946\ mL$

$$\frac{9.5\ gal \times 4\ qt \times 946\ mL}{1\ gal \times 1\ qt} =$$

35948 mL 36000mL ~~36mL~~

$3.5948 \times 10^4\ mL$

$3.6 \times 10^4\ mL$

	english		metric
Volume	1 qt	=	946 mL
mass	1 lb	=	454 g
length ~~(m)~~	1 in	=	2.54 cm

2B. $0.0513\ g \longrightarrow lbs$

$454\ g = 1\ lb$

$$\frac{0.0513\ g \times 1\ lbs}{454\ g} = 0.000112996$$

1.12996×10^{-4}

1.12996×10^{-4}

$1.13 \times 10^{-4}\ lbs$

2 C 450. mm ⟶ yards

✓ 1000 mm = 1 m

✓ 1 m = 100 cm

✓ 2.54 cm = 1 in

✓ 12 in = 1 ft

✓ 3 ft = 1 yd

Quiz

① Sig Figs

② metric to metric