I can perform calculations using scientific notation, significant figures, and unit conversions.

4.1. I can define metric units and prefixes and explain how metric units are used in measurement.

4.2. I can express numbers in scientific notation and standard notation.

4.3. I can perform calculations using significant figures.

4.4. I can convert between units, both metric and US standard.

4.5. I can distinguish between accuracy and precision in a given set of data

Hmwk: DA level 1

1. $\frac{14\,mm}{} \times \frac{1\,m}{1000\,mm} = \boxed{0.014\,m}$

2. $\frac{35\,kg}{} \times \frac{1000\,g}{1\,kg} = \boxed{3500\,g}$

3. $\frac{57\,ml}{} \times \frac{1\,L}{1000\,ml} = \boxed{0.057\,L}$

4. $\frac{88\,m}{1\,s} \times \frac{100\,cm}{1\,m} = \boxed{\frac{8800\,cm}{s}}$

5. $\frac{9.45\,g}{1\,L} \times \frac{1\,L}{100\,ml} = \boxed{0.00945\,g/ml}$

6. $\frac{3.55\,ml}{} \times \frac{13.6\,g}{1\,ml} = \boxed{48.3\,g}$

7. $\frac{45\,ml}{} \times \frac{11.3\,g}{1\,ml} = \boxed{510\,ml}$ (508.5)

8. $\frac{100.0\,ml}{} \times \frac{2.1\,kg}{1\,ml} = \boxed{21\,kg}$

9. $\frac{5.5\,s}{} \times \frac{15\,km}{1\,s} = \boxed{83\,km}$

10. $\frac{0.525\,mol}{} \times \frac{6.02 \times 10^{23}\,atoms}{1\,mol} = \boxed{3.16 \times 10^{23}\,atoms}$

11. $\frac{2.75\,L}{} \times \frac{61.2\,g}{1\,L} = \boxed{168\,g}$

12. $\frac{50.0\,ml}{} \times \frac{0.000245\,g}{1\,ml} = \boxed{0.0123\,g}$

10/2 Dimensional Analysis Continued

Steps for solving:

① Identify given and needed. (Look for questioning words)

② Determine if there are conversion factors given. (equalities)

③ Determine if there are one or more units to convert.

given: g/mL need: L — one unit to change

given: g/mL need: kg/L — two units to change

④ map out the conversions

given: g/mL → need: kg/L

given: km/hr → m or min → need: cm/sec

⑤ Write down the complete conversion problem. (← POINTS!)

⑥ Solve the problem. Check sigfigs & units.

Showing Labels only – complete the following:

How fast in $\frac{cm}{sec}$ is a kangaroo jumping if its speed is $\underbrace{68.7}_{3sf}\frac{km}{hr}$?

given: $\frac{68.7\,km}{1\,hr}$ → m → min; need: $\frac{?\,cm}{sec}$ ✓

$$\frac{68.7\,km}{1\,hr}\times\frac{1000\,m}{1\,km}\times\frac{100\,cm}{1\,m}\times\frac{1\,hr}{60\,min}\times\frac{1\,min}{60\,sec} = 1908.3 \rightarrow \boxed{1910\ \frac{cm}{sec}}$$

$(68.7\times1000\times100)\div(60\times60) =$

A snail moves $6.32\,\frac{cm}{min}$, what is this in $\frac{km}{hr}$? (m → km)

$$\frac{6.32\,cm}{1\,min}\times\frac{1\,m}{100\,cm}\times\frac{1\,km}{1000\,m}\times\frac{60\,min}{1\,hr} = 0.003792\,\frac{km}{hr}$$

How many seconds in 28 days? (no sigfig here)

$$\frac{28\,days}{1\,day}\times\frac{24\,hrs}{1\,hrs}\times\frac{60\,min}{1\,min}\times\frac{60\,sec}{1\,min} = \boxed{2419200\,sec}$$

The density of lead is $13.92\,\frac{kg}{L}$, what is that in $\frac{g}{cm^3}$?

* hint: $1ml = 1cm^3$