Gamma Fundamentals Workbook by David Barton, published in 2011.

Pages 46 and 47. The questions appropriated by Victoria Walker and Charlotte Walker are outlined in red.

8.02 Metric prefixes and conversions

Example
Convert 7250 m to kilometres.

Answer
There are 1000 m in a kilometre.
Dividing by 1000, 7250 m = 7.25 kilometres.

Example
Convert 4.2 litres to millilitres.

Answer
There are 1000 mL in a litre.
Multiplying by 1000, 4.2 L = 4200 mL.

Example
Convert 775 600 mm³ to cm³.

Answer
Note that a volume of 1 cm³ is the same as a volume of 1000 mm³.

$$775\,600 \text{ mm}^3 = \frac{775\,600}{1000} \text{ cm}^3$$
$$= 775.6 \text{ cm}^3$$

1 Change the units for these measurements as indicated.

a 8000 m to km _____

b 42 g to mg _____

c 0.375 L to mL _____

d 0.31 t to kg _____

e 58 mm to cm _____

f 7 m 385 mm to cm _____

g 49 000 kg to t _____

h 670 000 mm to m _____

2 Convert these area measurements.

a 64 ha to m² _____

b 21 500 m² to ha _____

c 4 cm² to mm² _____

d 3 km² to ha _____

e 6500 cm² to m² _____

f 79 000 ha to km² _____

3 Convert the following volume measurements.

a 84 cm³ to mm³ _____

b 1.56 cm³ to mm³ _____

c 7000 mm³ to cm³ _____

d 533 000 mm³ to cm³ _____

e 9 m³ to cm³ _____

f 375 000 cm³ to m³ _____

8.03 Metric applications – 1

1 A long metal rod is dipped vertically into an underground water tank to measure the amount of water in the tank. The rod is 2.7 m long. When the rod is removed, 638 mm of it is dry and the rest is wet. What is the depth of water in the tank?

_____

2 A 4 m length of dental floss is cut into lengths of exactly 45 cm. What is the length of the remaining piece?

_____

3 Tom is making a large quantity of marmalade. The recipe requires 10 kg of sugar. How many 750 g bags of sugar will Tom need?

_____

4 A stack of twenty empty jewel cases weighs 1160 g. When a CD is placed in each case, and the stack is weighed again, the total weight is 1.5 kg. Calculate the weight of one of these CDs.

_____

_____

(Continue to next page)

8 | Metric conversions and scales – 2

8.03 Metric applications – 2

1   A vacuum cleaner has an electric cord that is 15.6 m long. The flexible hose can extend to a distance of 335 cm from the vacuum cleaner, and the straight pipe is 1740 mm long. What is the maximum possible distance from the end of the straight pipe to where the vacuum cleaner's cord is plugged in? (Note: ignore the size of the vacuum cleaner.)

_____

2   A water distiller has a capacity of 4 litres. It can process 500 mL per hour. How long will the distiller have to run to process a full load of water?

_____

_____

3   Dishwashing powder can either be bought in 15 g pellets or in bulk in a 2 kg container. The pellets are placed individually into the dishwasher – one per load – while the bulk powder is poured carefully into a dispenser inside the dishwasher.

a   If a family use their dishwasher twice per day, how many days would you expect the 2 kg container of dishwashing powder to last?

_____

_____

b   What assumption do you need to make to work out the answer to part a?

_____

_____

4   Mish has three lengths of fishing line, measuring 14 m 75 cm, 17 m 80 cm and 28 m exactly.

a   Calculate the total length of the three pieces.

_____

_____

b   Mish ties the pieces together, ties one end to a sinker and the other end to a rod, and then goes fishing. At a spot where the water is supposed to be at least 60 m deep, the sinker does not touch the bottom. There are at least four valid reasons why – give two.

_____

_____

_____

5   A length of plastic wrap is rolled 60 times around a cardboard tube. The diameter of the tube is 5 cm including the plastic wrap, and 3 cm excluding the wrap. Estimate the thickness of the plastic wrap in mm (give your answer correct to 2 sf).

_____

_____

PUZZLE   Tax Freedom Day

'Tax Freedom Day this year is again 11 May,' said Roger Kerr, executive director of the New Zealand Business Roundtable. Mr Kerr said Tax Freedom Day 'represents the day in the year when the average New Zealander stops working for the government and starts working for themselves.'

1   Use this statement to calculate the percentage of income that an average New Zealander pays in tax to the government.

_____

2   In Australia, the average person's tax rate is 33.1% of their income. What day is Tax Freedom Day in Australia?

_____

_____

(Source: www.nzbr.org.nz/shop/Library+by+type/ No+Respite+on+Tax+Freedom+Day.html)