1 Arithmetic and numerical computation

Appropriate units in calculations

Guided questions

1 $15 \times 1000 = 15\,000\,\text{g}$

2 As there are $1000\,\text{mm}^3$ in $1\,\text{cm}^3$, divide the volume in mm^3 by 1000:

$650 \div 1000 = 0.65\,\text{cm}^3$

3 The unit of the rate should be volume per time, so $\text{cm}^3\,\text{min}^{-1}$ would be an appropriate unit. (Any other answer with sensible volume and time components is acceptable.)

Practice questions

4 $1\,\text{dm} = 10\,\text{cm}$, so $1\,\text{dm}^3 = 10\,\text{cm} \times 10\,\text{cm} \times 10\,\text{cm} = 1000\,\text{cm}^3$

Therefore, to convert $3.6\,\text{dm}^3$ to cm^3, multiply by 1000:

$3.6 \times 1000 = 3600\,\text{cm}^3$

5 $1\,\text{m}^3$ is a large volume, which equals 1 million cm^3. It is too large to use conveniently in most biological situations.

6 It would be difficult to use a measuring cylinder to measure accurately such a small volume as $1\,\text{mm}^3$, which is equivalent to only $0.001\,\text{cm}^3$.

7 **a** To describe the amount of energy flow per unit of woodland or grassland area each year, $\text{kJ}\,\text{m}^{-2}\,\text{year}^{-1}$ would be an appropriate unit (as would any other unit made up of sensible energy, area and time components).

b In an aquatic ecosystem, it would be necessary to measure the amount of energy flow in a volume of water rather than over an area of land, so the area component of the unit in (a) would need to be changed to a volume component.