Unit 2 – Measurement
2.11 – Area and Volume Conversions

- When converting between different units of area, we must remember to take into account the fact that area units are created by ***squaring the units***

  i.e. $\text{Area} = \text{length} \times \text{width} = \text{cm} \times \text{cm} = \text{cm}^2$

- In order to convert between area units:
  1. start with your given value

  2. choose the appropriate conversion factor
     i.e. $\dfrac{\text{unit wanted}}{\text{unit given}}$

  3. raise the conversion factor to the ***power of 2***
     i.e. $\left(\dfrac{\text{unit wanted}}{\text{unit given}}\right)^2$

  4. multiply the values from parts 1 and 3 together

  Examples: Convert between the following units.

  1. 193.2 cm → ? mm

  2. 47.6 ft → ? in

  193.2 cm² → ? mm²

  47.6 ft² → ? in²

  3. 64.1 m² → ? km²

  4. 500 000 yd² → ? mi²

  5. 38.6 ft² → ? yd²

  6. 2300 mi² → ? yd²

- When converting between different units of volume, we must remember to take into account the fact that area units are created by **_cubing the units_**

    i.e. Volume = length × width × height = cm × cm × cm = cm^3

- In order to convert between volume units:
    1. start with your given value

    2. choose the appropriate conversion factor
        i.e. $\dfrac{\text{unit wanted}}{\text{unit given}}$

    3. raise the conversion factor to the **_power of 3_**
        i.e. $\left(\dfrac{\text{unit wanted}}{\text{unit given}}\right)^3$

    4. multiply the values from parts 1 and 3 together

Examples: Convert between the following volume units.

1. 2000 cm → ? m

2. 8701 in → ? yd

    2000 cm^3 → ? m^3

    8701 in^3 → ? yd^3

3. 56 cm^3 → ? mm^3

4. 7.5 yd^3 → ? ft^3

Assignment

x 10	x 10	x 10	x 10	x 10	x 10

_____ km (kilometres)	_____ hm (hectometres)	_____ dam (decametres)	_____ m (metres)	_____ dm (decimetres)	_____ cm (centimetres)	_____ mm (millimetres)

÷10	÷10	÷10	÷10	÷10	÷10

$\times 1760$ $\times 3$ $\times 12$

mile	yard	feet	inches

$\div 1760$ $\div 3$ $\div 12$
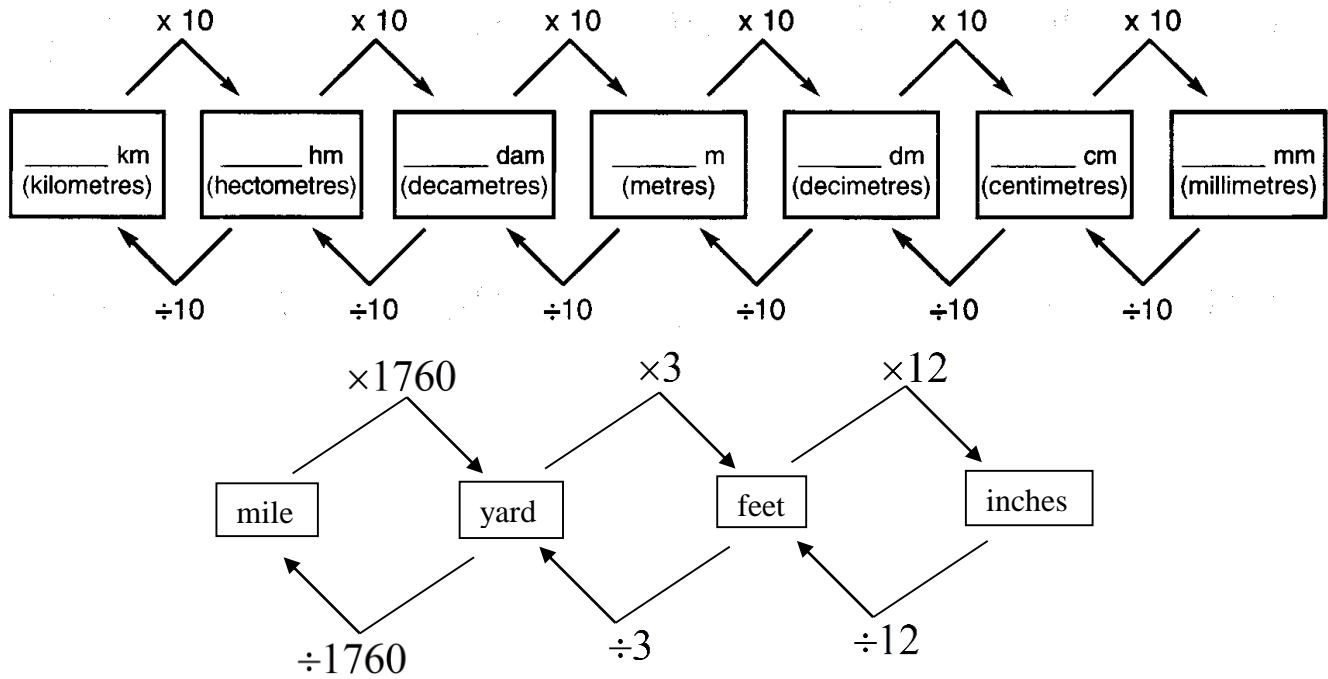
1. Convert between the following area units.

   a) $3.1 \text{ hm}^2 \rightarrow ? \text{ m}^2$

   b) $75 \text{ km}^2 \rightarrow ? \text{ dam}^2$

   c) $9.4 \text{ mi}^2 \rightarrow ? \text{ ft}^2$

   d) $12\,500 \text{ cm}^2 \rightarrow ? \text{ hm}^2$

   e) $189 \text{ dm}^2 \rightarrow ? \text{ dam}^2$

   f) $3419 \text{ in}^2 \rightarrow ? \text{ yd}^2$

g) $0.93 \text{ m}^2 \rightarrow ? \text{ mm}^2$

h) $4560 \text{ dam}^2 \rightarrow ? \text{ km}^2$

2. Convert between the following volume units.

a) $6\,000\,000 \text{ mm}^3 \rightarrow ? \text{ dm}^3$

b) $120 \text{ ft}^3 \rightarrow ? \text{ yd}^3$

c) $91 \text{ hm}^3 \rightarrow ? \text{ cm}^3$

d) $1.3 \text{ km}^3 \rightarrow ? \text{ m}^3$

e) $22 \text{ yd}^3 \rightarrow ? \text{ in}^3$

f) $500\,000 \text{ cm}^3 \rightarrow ? \text{ dam}^3$

g) $0.000\,94 \text{ dam}^3 \rightarrow ? \text{ mm}^3$

h) $10\,800 \text{ ft}^3 \rightarrow ? \text{ mi}^3$