

## CHAPTER 3B: Capacity and Conversions

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- Day 7 Capacity Calculations
- Day 8 Unit Conversions
- Day 9 Review for Unit Test

### Booklet Criteria

#### Assignments (2 marks per day)

- completed
- all work is shown
- pencil and ruler/protractor used

#### Class Notes

- completed
- pencil and ruler used

#### Details

- handed in on time
- care taken and neat
- used class time effectively



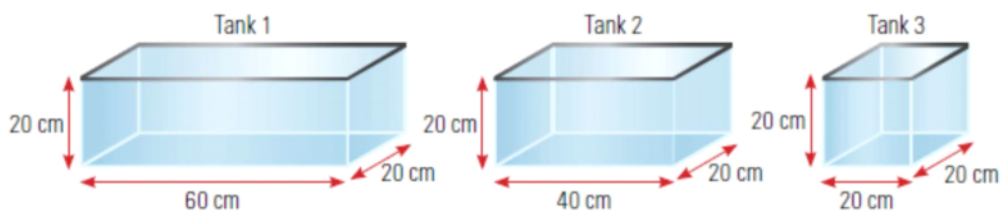
## Day 7: Volume and Capacity of Prisms and Cylinders

**Volume:** Space inside a 3D object  $\rightarrow$   $\text{cm}^3$ ,  $\text{m}^3$ ...

**Capacity:** Specific measure of volume as a fluid  
(Ex L, mL, Gallon, pint)

### Example 1:

Charlie sells different sizes of fish tanks in his pet store.



**Volume of Rectangular Prism =** (Base area)  $\times$  height ( $L \times W \times H$ )

a) What volume of water ( $\text{cm}^3$ ) will be needed to completely fill:

Tank 1:  $60 \times 20 \times 20 = 24000 \text{ cm}^3$

Tank 2:  $40 \times 20 \times 20 = 16000 \text{ cm}^3$

Tank 3:  $20 \times 20 \times 20 = 8000 \text{ cm}^3$

b) Convert the volumes of the fish tanks to a **capacity in litres**, 1 litre =  $1000 \text{ cm}^3$ .

Tank 1:  
 $24000 \div 1000$   
24L

Tank 2:  
 $\div 1000$   
16L

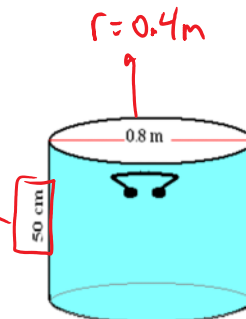
Tank 3:  
 $\div 1000$   
8L

**Example 2:**

A cylindrical soup container at an industrial cafeteria is 50 cm high and 0.8 m in diameter.

$$100\text{cm} = 1\text{m}$$

$$\frac{50\text{cm}}{100} = 0.5\text{m}$$



a) What is its volume in cubic metres?

$$\begin{aligned} V &= \text{base area} \times \text{Height} \\ &= \pi r^2 \times H \\ &= \pi \times 0.4^2 \times 0.5 \\ &= 0.25\text{m}^3 \end{aligned}$$

b) Find the capacity in litres

$$1\text{m}^3 = 1000\text{L}$$

~~Q~~ fool proof way:

$$\frac{1\text{m}^3}{1000\text{L}} \times 0.25\text{m}^3 \times \text{L} = 0.25 \times 1000 \div 1 = \boxed{250\text{L}}$$

Assignment pg 4-6

Don't do 1C

Answer for 5)  $32986.7\text{cm}^3$  and  $33.0\text{L}$  } Day 7

**Day 8 Assignment: Volume and Capacity of Prisms and Cylinders**

**Volume: in cubic units**

**Capacity: a fluid measure (mL, L, gal)**

1. Find the volume and capacity of the following rectangular prisms.

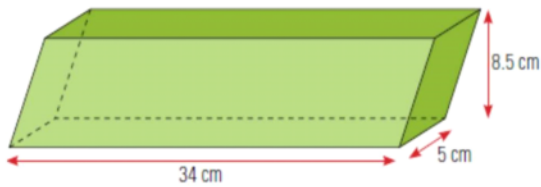
a) The base is 15.7 cm by 18.8 cm and the height is 12.5 cm.

b) The base is a square with sides of 2.75 m, and the height is 4.5 m.

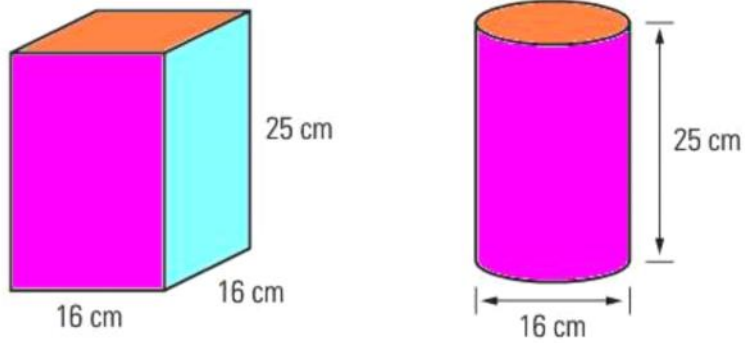
c) The base is  $1\frac{1}{2}$  inches by  $3\frac{3}{4}$  inches, and the height is  $2\frac{1}{4}$  inches.

**SKIP C!!**

2. Find the capacity in litres of the oblique rectangular prism below.

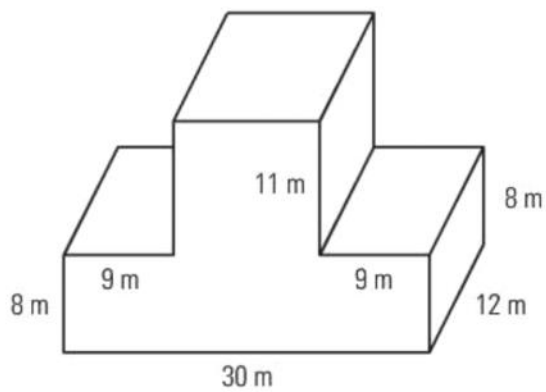


1. Which of these figures has the larger capacity? Show your work.



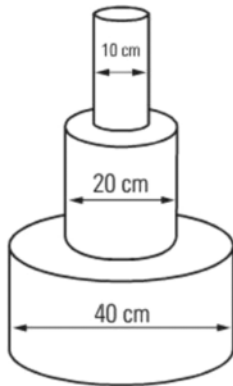
Capacity of Rectangle: \_\_\_\_\_ L      Capacity of Cylinder: \_\_\_\_\_ L

4. Find the volume of this figure.



b) Find the Capacity in L

5. Calculate the volume and capacity of the stacked cylinders below. Each cylinder has a height of 20 cm.



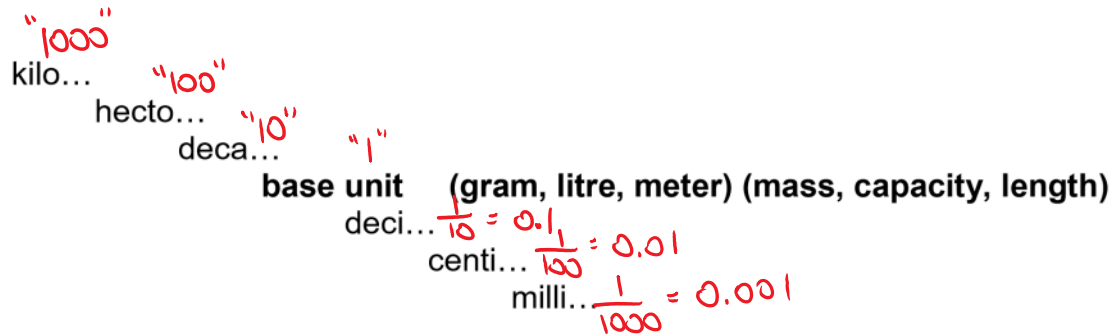
## Day 9: A) Converting Units within Metric and Imperial

### B) Converting Metric ↔ Imperial

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#### Part A: Converting Units within Metric and Imperial

Canada and most other countries use the metric system for measurements



You should know this order (a sentence can help):

King Henry Drank My Dark Chocolate Milk

from → to

Example 1.

$$1.8 \text{ kL} = \underline{180\,000} \text{ cL}$$

1.80000

$$4,567 \text{ mL} = \underline{0.4567} \text{ daL} \quad \text{K H D M D C M}$$

4567

## Part B: Converting Metric ↔ Imperial

Canada uses the Metric system for measurement. However, we use some imperial measurements because we often trade with the U.S.

### Example 1.

$$5 \text{ mi} = \underline{26400} \text{ ft}$$

$$\frac{1 \text{ Mi}}{5280 \text{ ft}} \times \frac{5 \text{ mi}}{1 \text{ mi}} = 5 \times 5280 \div 1 =$$

$$500 \text{ yards} = \underline{1500} \text{ miles}$$

$$\frac{1 \text{ Yard}}{3 \text{ ft}} \times \frac{500 \text{ Yard}}{1 \text{ Yard}} = 500 \times 3 \div 1 = 1500 \text{ ft}$$



## **Day 8 Assignment: Conversions**

### **Units within Metric/Imperial:**

1. 95.3m = \_\_\_\_\_ cm
2. 2040mm = \_\_\_\_\_ m
3. 69.83 km = \_\_\_\_\_ hm
4. 170.02 g = \_\_\_\_\_ dg
5. 240L = \_\_\_\_\_ mL
6. 99.9 kg = \_\_\_\_\_ g

### **Converting Metric ↔ Imperial**

7. 20 m = \_\_\_\_\_ yard
8. 16.2 ft = \_\_\_\_\_ in
9. 25.2 Gall = \_\_\_\_\_ L
10. 35 ft = \_\_\_\_\_ m
11. 98.7km = \_\_\_\_\_ miles
12. 3.2 quarts = \_\_\_\_\_ pint

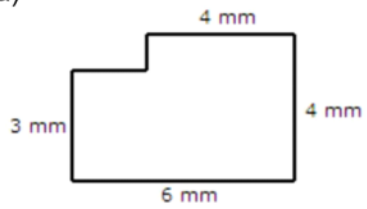
### **Mixed Conversions**

13. 75 cm = \_\_\_\_\_ yard
14. 15.4 dm = \_\_\_\_\_ ft

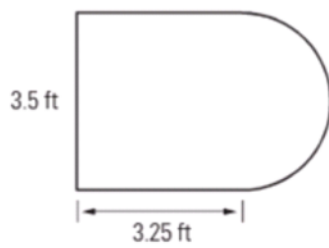
**Day 9: Review**

1. Find the **Surface Area** of the following:

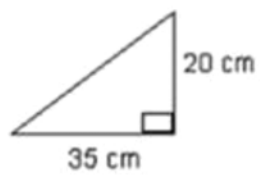
a)



b)

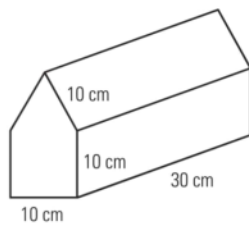


c)

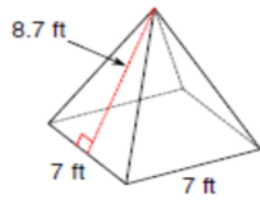


2. Find the **Volume** of the following:

a) Hint: height of roof is 8.7m



b)



c) A ball with a diameter of 15.9m

3. Convert the following

a)  $12.5 \text{ m} = \underline{\hspace{2cm}} \text{ cm}$

b)  $120.5 \text{ inches} = \underline{\hspace{2cm}} \text{ cm}$

c)  $2,300 \text{ ft} = \underline{\hspace{2cm}} \text{ yds}$

d)  $220 \text{ US gall} = \underline{\hspace{2cm}} \text{ L}$

e)  $250,000 \text{ cm}^3 = \underline{\hspace{2cm}} \text{ L}$

f)  $340 \text{ cm} = \underline{\hspace{2cm}} \text{ yds}$

**Answer Key, Unit 3B (Day 7-9)**

**Day 7:**

1. A)  $3689.5 \text{ cm}^3$ , 3.69 L  
B)  $34.0 \text{ m}^3$ , 34000 L  
C) \*change all dimensions to cm first  
 $207.4 \text{ cm}^3$ , 0.207 L
2. 1.445L
3. Rectangle: 6.4L      Cylinder: 5.024L
4.  $4464 \text{ m}^3$  b) 4464000L
5.  $w = 6.2 \text{ cm}$

**Day 8:**

**Linear:**      1. 9530      2. 2.04      3. 698.3      4. 1700.2      5. 240 000      6. 99 900

**Metric to imperial**

7. 21.87 yards
8. 194.4 in
9. 95.4 L
10. 10.7m
11. 61.3 mi
- 12 6.4 pints
13. 0.82 yard
14. 5.05 ft