

CHAPTER 3B: Capacity and Conversions

- 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



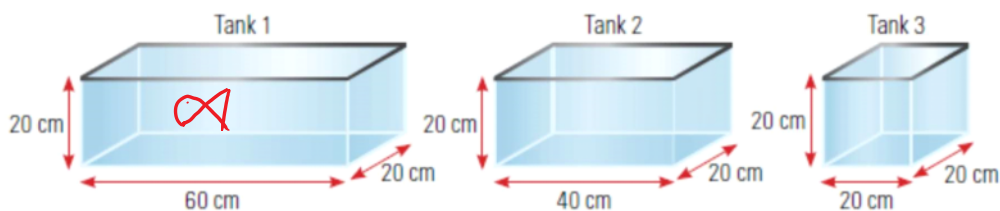
Day 7: Volume and Capacity of Prisms and Cylinders

Volume: Space inside a 3D object (Ex cm^3, m^3)

Capacity: Specific measure of volume as a fluid
(Ex L, mL, pints, gallons)

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 (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 cm^3 .

Tank 1:
 $24000 \div 1000$
 $= 24\text{L}$

Tank 2:
 $\div 1000$
 16L

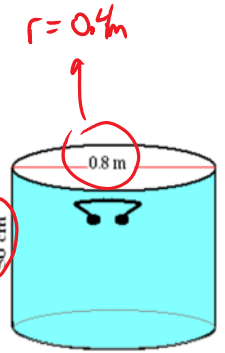
Tank 3:
 $\div 1000$
 8L

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?

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

b) Find the capacity in litres

~~the~~ Fool proof way to convert ~~the~~

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

$$\frac{1\text{m}^3}{1000\text{L}} \rightarrow 0.25\text{m}^3 \rightarrow \text{XL}$$

$$1000 \times 0.25 \div 1 = 250\text{L}$$

Assignment pg 4-6

~~the~~ don't do IC

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.

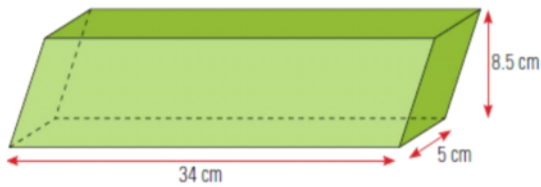
a) The base is 15.7 cm by 18.8 cm and the height is 12.5 cm.

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

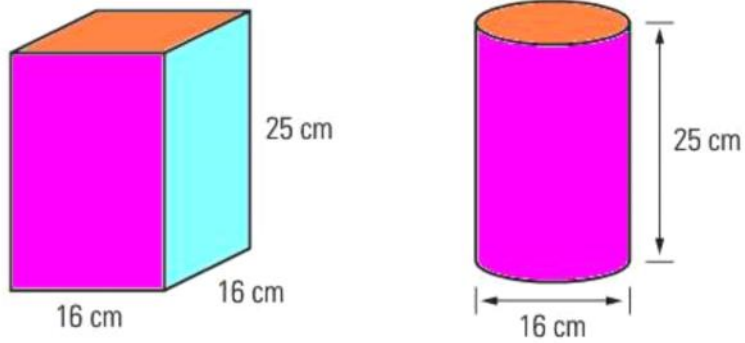
c) The base is $1\frac{1}{2}$ inches by $3\frac{3}{4}$ inches, and the height is $2\frac{1}{4}$ inches.

SKIP C!!

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

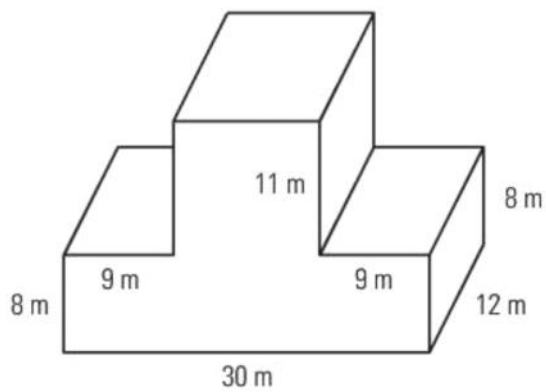


1. Which of these figures has the larger capacity? Show your work.



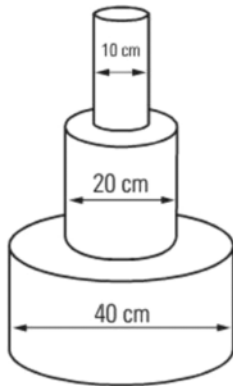
Capacity of Rectangle: _____ L Capacity of Cylinder: _____ L

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.

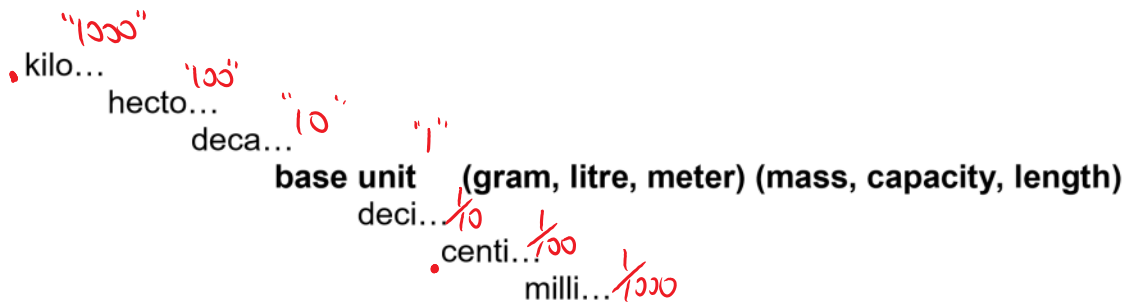


Day 9: A) Converting Units within Metric and Imperial

B) Converting Metric ↔ Imperial

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.

$$1.8 \text{ kL} = \underline{180000} \text{ cL}$$

1.80000

$$4,567 \text{ mL} = \underline{0.4567} \text{ daL} \quad \begin{array}{c} \text{deci litre} \\ \swarrow \\ \text{K H D M D C [M]} \\ \leftarrow \end{array}$$

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.

$$5 \text{ mi} = \underline{26400} \text{ ft} \quad 5 \times 5280$$

$$\frac{1 \text{ Mi}}{5280 \text{ ft}} = \frac{5 \text{ Mi}}{26400 \text{ ft}}$$

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

$$\frac{1 \text{ yard}}{3 \text{ ft}} = \frac{500 \text{ yard}}{1500 \text{ ft}}$$

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

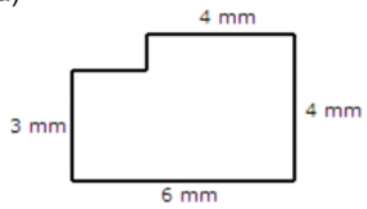
Mixed Conversions

13. 75 cm = _____ yard
14. 15.4 dm = _____ ft

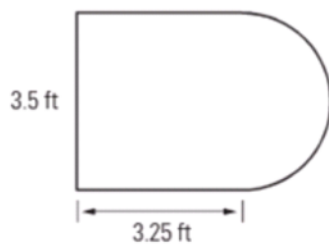
Day 9: Review

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

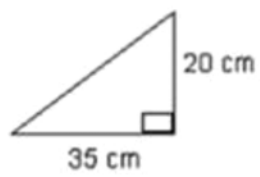
a)



b)

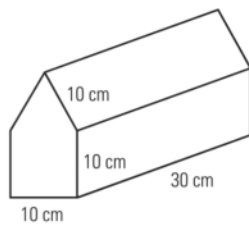


c)

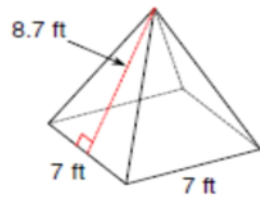


2. Find the **Volume** of the following:

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 cm^3 , 3.69 L
B) 34.0 m^3 , 34000 L
C) *change all dimensions to cm first
 207.4 cm^3 , 0.207 L
2. 1.445L
3. Rectangle: 6.4L Cylinder: 5.024L
4. 4464 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