DO NOW ON PAPER- NO CHROMEBOOK THIS TIME!!

Convert.

1 a. 2,000 m = 2 km

1 b. 9 km = 9000 m

2 a. 9,000 ml = 9 L

2 b. 3 kg = 3000 g

Aug 15-2:50 PM

Conversion Challenge

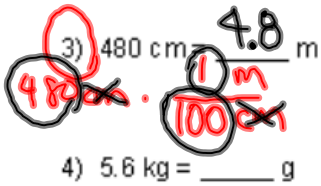
Write the correct abbreviation for each metric unit.

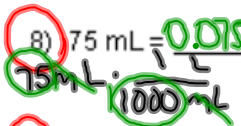
1) Kilogram kg
2) Meter m
3) Gram g
4) Milliliter mL
5) Millimeter mm
6) Liter L
7) Kilometer km
8) Centimeter cm
9) Milligram mg

Try these conversions, using the ladder method.

45in · 1 ft / 12in = 3.75ft

1) 2000 mg = _____ g
2) 104 km = _____ m
3) 480 cm = 4.8 m
4) 5.6 kg = _____ g
6) 5 L = _____ mL
7) 198 g = _____ kg
8) 75 mL = 0.075 L
9) 50 cm = _____ m
11) 16 cm = 160 mm
12) 2500 m = _____ km
13) 65 g = _____ mg
14) 6.3 cm = _____ mm





Aug 16-11:34 AM

WWK

3. Volume- the amount of space an object occupies.

Volume Solids	Volume Liquids
L x W x H	L, mL
cubic units	graduated cyl.

4. Density- amount of mass per unit of volume of an object

$D = mass / volume$

Aug 16-12:05 PM

TOC 17-18 Volume and Density

Volume: the amount of space that an object occupies.

* derived unit

$V = m / D$ (volume = mass / density)

$D = m / V$ (density = mass / volume)

* derived unit

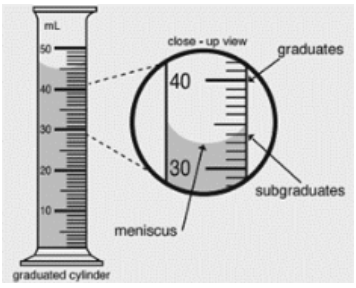
the amount of mass per unit of volume of an object **Density**

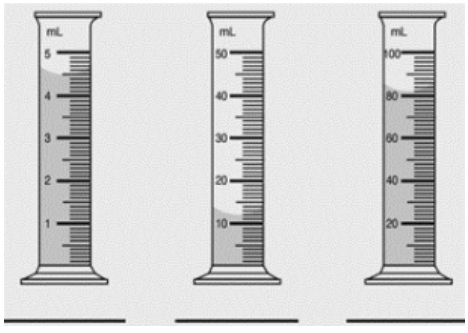
Aug 15-2:54 PM

Welcome! Please get your ISN (composition book) from your shelf and have a seat! Complete the warmup on your Chromebook!!!!

Aug 17-11:42 AM

Inside the top of the VOLUME flap...





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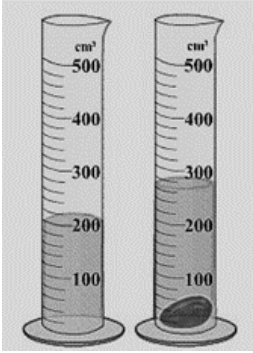
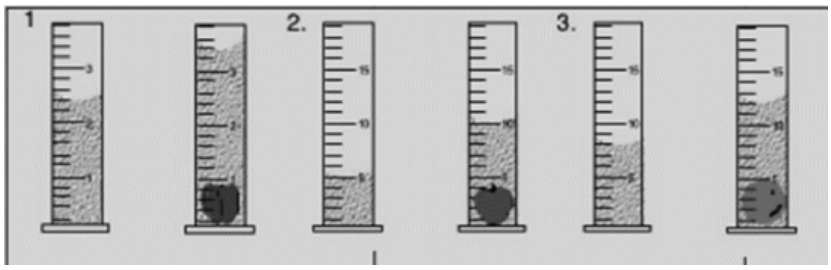
Inside the bottom of the VOLUME flap...





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Inside the top of the Density flap...

$$\text{Density} = \frac{\text{mass}}{\text{volume}} = \frac{g}{mL} \text{ or } \frac{g}{cm^3}$$

$$1mL = 1cm^3$$

Aug 15-2:56 PM

Inside the bottom of the DENSITY flap...

Density = Mass / Volume $V \cdot D = \frac{m}{V} V$

1) Rearrange the density equation for the following:

Mass = $D \cdot V$ Volume = $\frac{m}{D}$

2) Calculate the density of a material that has a mass of 52.457 g and a volume of 13.5 cm^3.

$D = \frac{m}{V} \rightarrow \frac{52.457\ g}{13.5\ cm^3} = 3.89\ g/cm^3$

3) A student finds a rock on the way to school. In the laboratory he determines that the volume of the rock is 22.7 mL, and the mass in 39.943 g. What is the density of the rock?

$D = \frac{m}{V} \rightarrow \frac{39.943\ g}{22.7\ mL} = 1.76\ g/mL$

Aug 15-2:57 PM

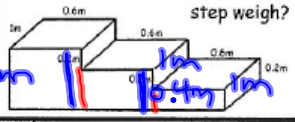
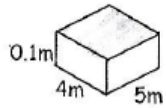
pg 17 examples

Density, Mass and Volume

Bronze Activity $m = DV$

WILF

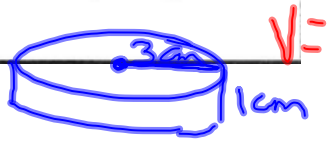
Calculate density or mass when information is given in the SAME unit.

7 Lead has a density of 11.5g/cm³. A cylindrical block of lead has a radius of 5 cm and a height of 3cm. Find the mass (in kg correct to 3 dp). $V = \pi 5^2 \cdot 3 = 75\pi$ $235.62\ cm^3$ $1\ m^3 = (235.62\ cm^3)$	8 Olympic medals have a diameter of 6cm and a thickness of 1cm. Gold has a density of 19g/cm³. Work out mass of a gold medal (to 3dp).	9 The density of concrete is 2400kg/m³. How much will the step weigh? 0.6m 
4 Calculate the density in kg/m³.  Mass = 25kg $\frac{2709.63g}{1000} = 2.710kg$	5 Lead has a density of 11.5g/cm³. A rectangular block of lead measures 4cm × 5cm × 2cm. Find the mass.	6 A wooden cube has lengths 8cm. It has a mass of 307.2g. Find the density of the cube.
1 A butter block weights 200 g. The dimensions are 8 cm by 5 cm by 6cm. What is its density (to 3dp)?	2 A shipping container weights 100kg. The dimensions are 5 metres by 5 metres by 8 metres. What is the density?	3 A sculpture is made of bronze (density 8.5 g/cm³). It measures 2cm x 2cm x 147 cm. Find its mass (in kg).

Aug 15-2:57 PM

7 Lead has a density of 11.5g/cm³. A cylindrical block of led has a radius of 5 cm and a height of 3cm. Find the mass (in kg correct to 3 dp).

8 Olympic medals have a diameter of 6cm and a thickness of 1cm. Gold has a density of 19g/cm³. Work out mass of a gold medal (to 2 dp).



$r = 3cm$

$h = 1cm$

$V = \pi \cdot 9 \cdot 1 cm$

$V = 28.27 cm^3$

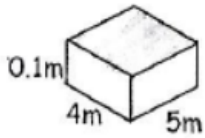
$M = DV$

$M = (19 g/cm^3)(28.27 cm^3)$

$M = 537.21 g$

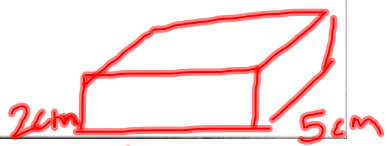
Aug 17-12:27 PM

4 Calculate the density in kg/m³.



Mass = 25kg

5 Lead has a density of 11.5g/cm³. A rectangular block of lead measures 4cm × 5cm × 2cm. Find the mass.



$V = 2 m^3$

$D = \frac{m}{V} = \frac{25kg}{2m^3}$

$D = 12.5 kg/m^3$

$V = 40 cm^3$

$M = DV = (11.5 g/cm^3)(40 cm^3)$

$M = 460 g$

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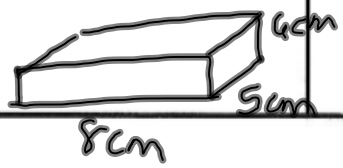
1 A butter block weights 200 g. The dimensions are 8 cm by 5 cm by 6cm. What is its density (to 3dp)?



$V = 240\,cm^3$

$D = \frac{m}{V} = \frac{200g}{240cm^3}$

$D = 0.833\,g/cm^3$

2 A shipping container weights 100kg. The dimensions are 5 metres by 5 metres by 8 metres. What is the density?

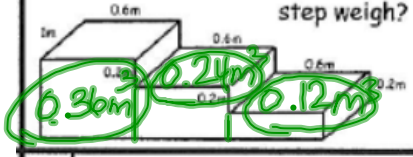
$V = 200\,m^3$

$D = \frac{m}{V} = \frac{100kg}{200m^3}$

$D = 0.5\,kg/m^3$

Aug 17-12:28 PM

9 The density of concrete is $2400kg/m^3$. How much will the step weigh?



$V = 0.72m^3$

$D = 2400\,kg/m^3$

$m = DV = (2400\,kg/m^3)(0.72m^3)$

$D = 1728kg$

6 A wooden cube has lengths 8cm. It has a mass of 307.2g. Find the density of the cube.

$V = 512\,cm^3$

$D = \frac{m}{V} = \frac{307.2g}{512\,cm^3} = 0.6\,g/cm^3$

3 A sculpture is made of bronze (density $8.5\,g/cm^3$). It measures 2cm x 2cm x 147 cm. Find its mass (in kg).

$V = 588\,cm^3$

$m = DV = (8.5\,g/cm^3)(588cm^3)$

$m = 4998g = (4.998kg)$

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Calculate the densities of the following objects. **Remember to place units after each number.**

Object A length = 6cm width = 3cm height = 1cm mass = 36g

volume = _____ density = _____

Object B length = 10cm width = 5cm height = 2cm mass = 300g

volume = _____ density = _____

Object C Use the water displacement method to determine the density of object C (silly putty).
initial water level in graduated cylinder = 25ml
final water level after placing silly putty into graduated cylinder = 29ml
mass of silly putty=8g

Aug 17-11:28 AM

Which of the following materials will float on water (density 1 g/ml)?

air = .001 g/cm^3
corn oil = .93 g/cm^3
glycerine = 1.26 g/cm^3
corn syrup = 1.38 g/cm^3
wood = .85 g/cm^3
steel = 7.81 g/cm^3
rubber = 1.34 g/cm^3
ice = .92 g/cm^3
water = 1.00 g/cm^3

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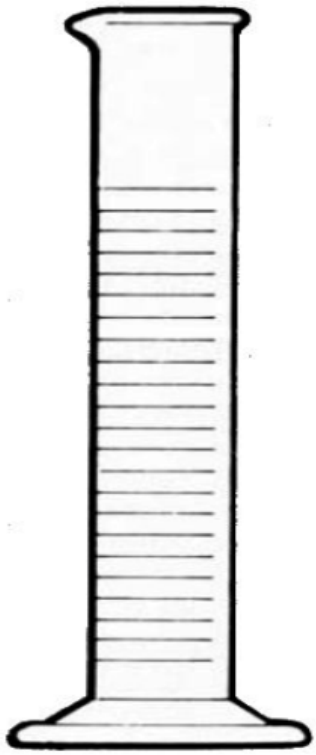
Assuming the materials don't mix, show how the materials would "stack up" in a graduated cylinder.



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