

Science Notebook Layout **DON'T COPY UNDERLINED TEXT**

Mrs. Aguirre's Webpage: <http://www.quia.com/profiles/caguirre>

Finding Density

DENSITY

$$\text{Density (g/cm}^3\text{)} \rightarrow D = \frac{m \leftarrow \text{Mass (g)}}{V \leftarrow \text{Volume (cm}^3\text{)}}$$

Density calculation:

Density = Mass/Volume

$$= \frac{\text{g}}{\text{cm}^3}$$

$$= \frac{\text{g}}{\text{cm}^3}$$

Calculate all densities for cubes on other page using volume found above.

Round to nearest hundredth. Include all units as shown in example

<u>PVC:</u> D = Mass/Volume = ___g/ ___cm ³ = ___g/cm ³	<u>Lead</u> D = M/V = ___g/ ___cm ³ = ___g/cm ³
<u>Aluminum</u> D = M/V = ___g/ ___cm ³ = ___g/cm ³	<u>Brass</u> D = M/V = ___g/ ___cm ³ = ___g/cm ³
<u>Pine</u> D = M/V = ___g/ ___cm ³ = ___g/cm ³	<u>Copper</u> D = M/V = ___g/ ___cm ³ = ___g/cm ³
<u>Acrylic</u> D = M/V = ___g/ ___cm ³ = ___g/cm ³	<u>Steel</u> D = M/V = ___g/ ___cm ³ = ___g/cm ³
<u>Oak</u> D = M/V = ___g/ ___cm ³ = ___g/cm ³	<u>Nylon:</u> D= M/V = 18.5g/ 15.625cm ³ = 1.184 g/cm ³

Introduction to Density 11/7/11

Which weighs more, a pound of feathers or a pound of bricks? Explain.

Data Table:

Item	Observations	Item	Observations
PVC	26.2 g	Lead	163.4 g
Aluminum	46.4 g	Brass	137.0 g
Pine	11.5 g	Copper	146.3 g
Acrylic	19.5 g	Steel	126.2 g
Oak	8.9 g	Nylon	18.5 g

For each item, write three observations- one qualitative and one quantitative. Under the chart, make a list:

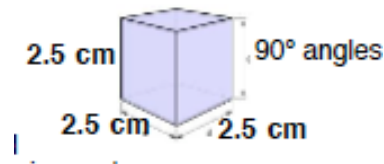
How they are similar:

How they are different:

THE CUBES

The cubes are similar in:

and different in:



VOLUME: Regular shaped solid

FORMULA: Volume = L x W x H

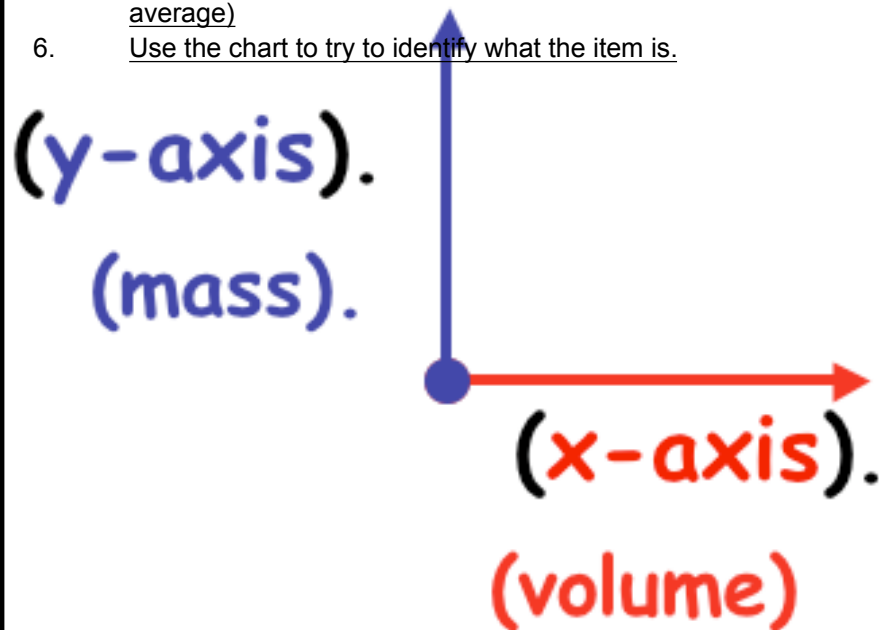
$$= \text{___ cm} \times \text{___ cm} \times \text{___ cm}$$

=

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1. Describe the objects- color, etc
2. **Measure Mass** with scale in grams.
3. Use the displacement method to find the volume in mL.
4. Graph your data on graph paper. Draw trend line.
5. Calculate the item's density in g/mL.*** (slope of line-average)
6. Use the chart to try to identify what the item is.



Copy graph on next page- tape it into your notebook

Density of Solids 11/9/11

Density describes how much mass is in a given volume of a material.

Mass is measured by a **scale** in **grams**.

Volume can be measured by 2 techniques:

- A) Volume formula ($l * w * h$) Or
- B) **displacement**.

Volume	Mass	Observations (color, texture, size, etc)

Volume	Mass	Observations (color, texture, size, etc)

Copy this under the charts. Use 6 lines

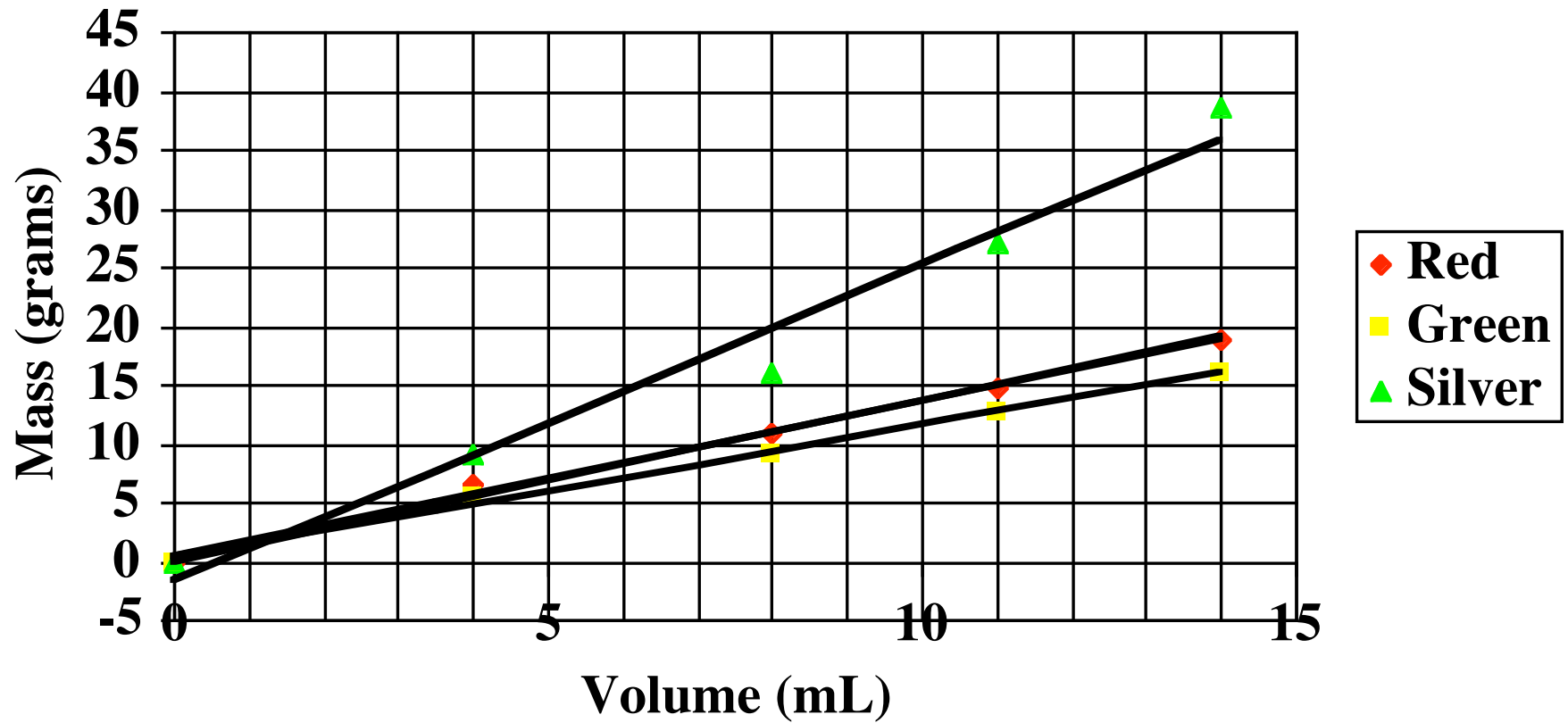
Density calculations:

$$\begin{aligned} 1. \text{ Density} &= \text{Mass/Volume} \\ &= \text{___g/ ___mL} \\ &= \text{___g/mL} \end{aligned}$$

We think the _____ object is : _____
_____ (describe it) because...

(use the chart to try to identify the solids)

Densities of Solids



Densities of items in increasing order

0.64 g/ml	Walnut
0.75 g/ml	Oak
0.77 g/ml	Maple
0.90 g/ml	Polypropylene
0.92 g/ml	LDPE (polyethylene)
1.15 g/ml	Nylon
1.17 g/ml	Acrylic
1.23 g/ml	Polyurethane
1.32 g/ml	Phenolic
1.37 g/ml	PVC (Polyvinylchloride)
1.42 g/ml	Acetyl
2.2 g/ml	Teflon
2.7 g/ml	Aluminum
7.7 g/ml	Steel
7.9 g/ml	Iron
8.56 g/ml	Brass
8.91 g/ml	Copper
11.3 g/ml	Lead

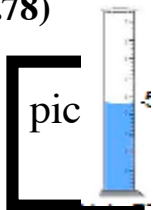
Definition and units to use: (page 78)

INSTRUCTION MANUAL-

To find the volume of: (List steps from p 78 to find the volume of each)

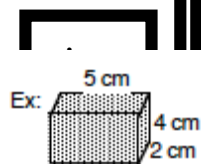
1. LIQUIDS (p.78)

- a.
- b.



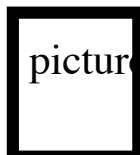
2. REGULAR SHAPE SOLID

- a.
- b.
- c.

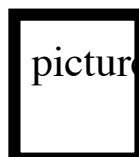


3. DISPLACEMENT METHOD (illustrated) for irregular Solids (use last two paragraphs on P78 to describe and draw the four steps in displacement method.)

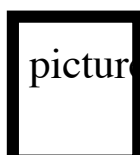
A. Fill the...



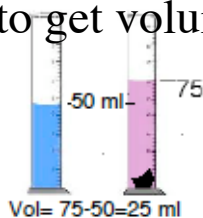
B. Slide the object...



C. What happens?



D. How to get volume



WILL DIFFERENT AMOUNTS OF A MATERIAL HAVE DIFFERENT DENSITIES?

Amount of water	Density (g/mL)
90 mL	
80 mL	
70 mL	
60 mL	
50mL	
40 mL	
30 mL	
20 mL	
100 mL	

The density of the water is the same for each group because.....

Density is a _____.

As mass increases, volume _____,

so when you _____ mass by volume, you get the _____ answer.

Different amounts of the



Material have the Same Density