

Governor's Institute for Physical Science Project:  
10 hour Curriculum Unit  
Conservation of Matter and Density

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## Pennsylvania State Standards

### Unifying themes

#### 3.1.10

- C. Apply patterns as repeated processes or recurring elements in science and technology.
- D. Apply scale as a way of relating concepts and ideas to one another by some measure.
- E. Describe patterns of change in nature, physical and man made systems.

### Inquiry and Design

#### 3.2.10

- A. Apply knowledge and understanding about the nature of scientific and technological knowledge.
- B. Apply process knowledge and organize scientific and technological phenomena in varied ways.
- D. Identify and apply the technological design process to solve problems.

### Physical Science

#### 3.4.10

- D. Explain essential ideas about composition and structure of the universe.

### Technological Devices

#### 3.7.10

- A. Identify and safely use a variety of tools, basic machines, materials and techniques to solve problems and answer questions.
- B. Apply appropriate instruments and apparatus to examine a variety of objects and processes

Overview of Conservation of Matter and Density Unit.

<p>Day 1</p> <p>Conservation of Mass Lab</p>	<p>Day 2</p> <p>Graph data from Conservation of Mass Lab</p>	<p>Day 3</p> <p>1) Discussion of what the Law of conservation of Matter means 2) Density</p>	<p>Day 4</p> <p>Density of solids lab exercise</p>	<p>Day 5</p> <p>Percent Error</p> <p>Practice problems How to so arithmetic of measurements,</p>
<p>Day 6</p> <p>How accurate is the balance. Using known density to find mass.</p>	<p>Day 7</p> <p>Second Part of lab</p>	<p>Day 8</p> <p>Identification of the gas produced by the combination of water and Alka-Seltzer</p>	<p>Day 9</p> <p>Find the Density of a gas</p>	<p>Day 10</p> <p>Balloon Anomaly Assessment</p>

## Day 1 - Lesson Plan – Conservation of Matter lab

### Objectives:

- 1) Demonstrate the Conservation of Mass Law.
- 2) Assess the use of the balance

### Opening:

- 1) Distribute materials
- 2) Ask the question "In a closed system (one in which nothing can enter or leave) will mass change? Will the mass change during a chemical change?" Discuss, accept all answers and have students write down their answer

### Class:

- 1) Walk through lab Directions<sup>1</sup>, and safety precautions
- 2) Students perform lab ( In a 40 minute class you may only get 6 of 8 trials completed
- 3) Collect students' answers to #4 in the data table.

Closing: Remind student to answer lab questions for Homework.

### Materials:

A class set of the following:

- Lab worksheet
- Small bottle with cap
- Alka-Seltzer
- Balance
- 2 Beakers
- goggles
- Water

Safety concerns: A piece of Alka-Seltzer that is too large, or filling the bottle with too much water may cause it to burst.

### Rubric (based on a 20 point lab)

- 1) Followed all lab rules \_\_\_\_\_ of 4
- 2) Followed all directions \_\_\_\_\_ of 4
- 3) Returned all materials (cleaned) \_\_\_\_\_ of 4
- 4) Answers to #4 represent conscientious work \_\_\_\_\_ of 4  
(answers should all be around 0.0g within the accuracy of the balance)
- 5) Hypothesis, Conclusions and questions \_\_\_\_\_ of 4

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<sup>1</sup> Lower level students perform better if the entire class performs trial 1 together.

Name \_\_\_\_\_ Date \_\_\_\_\_  
Period \_\_\_\_\_

### Mass Lab

#### Materials

Bottle with cap  
Alka-Seltzer  
Balance  
2 beakers  
Paper towel  
goggles  
Water

Hypothesis: In a closed system (one in which nothing can enter or leave) will mass change? Will the mass change during a chemical change?

#### Procedure:

1. Get 1 bottle with cap, 1 Alka-Seltzer tablet, 1 balance, 1 beaker full of water, 1 empty waste beaker, and a paper towel NOTE: BE CAREFUL NOT TO GET THE ALKA-SELTZER WET.
2. Divide the Alka-Seltzer into 8 approximately equal parts.
3. Fill the bottle 1/3 full of water. Place 1/8 of the tablet in the cap of the bottle.
4. Find the mass of the bottle, water and cap and Alka-Seltzer. Record it in the data table.
5. Put the cap on the bottle quickly and tighten it. (making sure to get the Alka-Seltzer into the bottle) Allow it to fizz.
6. Find the mass. Record it in the data table.
7. Open the cap and allow the air to escape. Find the mass and record it.
8. Subtract the mass before from the Mass after fizz place the answer in #4
9. Subtract the Mass before from the mass after opening place the answer in #5
10. Repeat with the remaining Alka-Seltzer pieces
11. Place your answers to # 4 on the teacher's data table

### Data

	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7	Trial 8	Average (add across and divide by 8)
1) Mass before									
2) Mass after fizz									
3) Mass after opening									
4) Mass Change before (1-2)									
5) Mass Change after (1-3)									

Conclusion: In a closed system did the mass change? Support your answer

### Questions

- 1) Why do you think the mass changes when the bottle is opened, but does not significantly change when the bottle is closed?
  
- 2) The process shown in this lab is the basis of a scientific law. What do you think that law is?



## Day 2 - Lesson Plan – Graphing Data

### Objectives:

- 1) Graph Data in a Histogram

Opening: Pass out copies of teacher's data table. (The more data you have the better the results). Ask students to interpret it. What does it mean? What is the significance? What could we do to the data to see the significance? Graph it! Which type of graph to use? Line? Pie? Bar? Histogram!<sup>2</sup>

### Class:

Make the graph

- a) Coin demonstration for histogram. Take a pile of assorted coins. Ask students how they would organize them? Have students separate the coins into piles of denomination and stack the coins. Draw the connection between a histogram and the stacks of coins.
- b) Data will be sorted into "piles", which is the X- axis of the graph. As a class decide the "piles". (For example 0.0, - 0.1 to -0.9, -1.0 to -1.9, -2+, 0.1 to 0.9, 2+)
- c) The Y-axis will be the frequency, the number of data points in each "pile"
- d) Start the graph with the students and allow them to complete it

Closing: Re-ask the lab questions. Have students for homework try to develop a theory.

### Materials:

A class set of the data  
Graph paper  
Class Set of coins

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<sup>2</sup> A Histogram is a bar graph that shows the frequency of an occurrence.

## Day 3 - Lesson Plan – Conservation of matter and Density

Objectives: Using students Data, prove the Conservation of Matter Law

Opening:

1) Class: Conservation of Mass.

Discuss. What does the data tell us? Ask leading questions until you get someone to say that the mass does not change. Draw the connection between mass and matter and pull out if the Mass does not change then the amount of matter does not change and therefore "Matter can neither be created nor destroyed in a chemical reaction."

2) Density as a property of matter.

a) How to use formula Density = Mass/ Volume. Use circle formula for lower levels. Cover the letter representing the factor that you are looking for.



The remain two letters tell you how to solve the formula. For instance cover the M and remaining are D next to V so multiply Density and volume to find mass.

b) Use commonly found Objects to practice calculating density, and highlight the major aspects of density.

1. A substance will float in a substance of greater density. (empty bottle)
2. A substance will sink in a substance of lower density (full bottle)
3. A substance with a density close to another substance will "fink" semi-float. (half full bottle)
4. Objects of the same material will have the same densities. (Two different samples of the same material.)
5. Change the "total" density
  - a) aluminum foil boat verses aluminum foil ball.

Closing: Sum up. Assign worksheet for homework as reinforcement

Materials:

A class set of the following:

Class Notes

Table for Common Objects

Homework

Class Notes

Conservation of Mass - In a closed system mass does not change.

Conservation of Matter - Matter cannot be created or destroyed in a chemical reaction.

Density - The amount of matter in a given amount of space.

Formula -  $\text{Density} = \text{Mass} / \text{volume}$

If you work with density the units must be the same

Units  
g/mL  
g/L  
kg/L

Common density  
Water = 1g/mL = 1000 kg/L  
Air = 0.00129g/mL

Density is changed by temperature. Generally speaking the hotter something is the less dense it is, the colder something is the more dense it is.

Name \_\_\_\_\_ Date \_\_\_\_\_  
Period \_\_\_\_\_

1. What is density?
2. What is the density of water?
3. What was the density of the empty bottle?
4. What was the density of the \_ full bottle?
5. What happened when the bottles where placed in the water?
6. In terms of density why does something float?
7. \* What is buoyancy?
8. In terms of density why did the aluminum foil boat float and the flattened piece of aluminum not?
9. What is the Law of conservation of Matter?
10. What is the only way matter can be created or destroyed?

Complete the table, calculated the Densities, and use that to identify the substance.

Mass	Volume	Density	Substance
20.15g	2.56ml		
63.88g	7.13ml		
10.56			Aluminum

Name	Mass	Volume	Density
Empty Bottle			
Full Bottle			
_ Full bottle			
Styrofoam Ball			
Lg wooden Block			
Sm wooden block			
Small metal block			
Lg metal block			

## Day 4 - Lesson Plan – Density Lab

### Objectives:

- 1) To practice calculating density
- 2) To practice measuring mass and volume

### Opening:

- 1) Distribute materials
- 2) Have students predict which substance is which based on their knowledge of metals.

### Class:

- 1) Walk through lab Directions, and safety precautions
- 2) Students perform lab.
- 3) Collect the densities for each substance.

### Materials:

A class set of the following:

- Lab worksheet
- 4 different samples of metals
- 2 Beakers
- Graduated cylinder
- balance

### Rubric (based on a 20 point lab)

- |   |            |
|---|------------|
| 1) Followed all lab rules                 | _____ of 4 |
| 2) Followed all directions                | _____ of 4 |
| 3) Returned all materials (cleaned)       | _____ of 4 |
| 4) Densities represent conscientious work | _____ of 4 |
| 5) Hypothesis, Conclusions and questions  | _____ of 4 |

Name \_\_\_\_\_  
Period \_\_\_\_\_

Date \_\_\_\_\_

### Density Lab

Substance	Density
Copper	8.96 g/mL
Aluminum	2.70 g/mL
Zinc	7.13 g/mL
Tin	7.31 g/mL
Lead	11.4 g/mL
Iron	7.87 g/mL

Purpose: To find the density of unknown substances.

Hypothesis: Substance 1 looks like \_\_\_\_\_.  
Substance 2 looks like \_\_\_\_\_.  
Substance 3 looks like \_\_\_\_\_.  
Substance 4 looks like \_\_\_\_\_.

Materials:

Graduated cylinder

Beaker

Unknown metals

Balance

Procedure:

- 1) Using the balance find the mass of each substance. Record it in the data table.
- 2) Find the volume of each substance through water displacement. Record it in the data table.
- 3) Calculate the density of each substance.

Data Table

Substance	Mass	Original volume	End volume	Volume of substance	Density
1					
2					
3					
4					

Conclusion: Based on the calculated density :

Substance 1 is \_\_\_\_\_  
Substance 2 is \_\_\_\_\_  
Substance 3 is \_\_\_\_\_  
Substance 4 is \_\_\_\_\_

## Day 5 - Lesson Plan - Percent Error

**Objectives:** To highlight the need for accuracy and multiple trials in measurements. To introduce the concept percent error.

**Opening:** Ask the question "On yesterday's lab how close were your densities to the densities given? How off were your numbers?"

**Class:**

- 1) Using the percent error worksheet walk students through the formula until they are comfortable with it.
- 2) Have students then work on the Percent error Calculations for the density lab.

**Closing:** Wrap up with the question of ways to improve the accuracy of measurements.

**Materials:**

A class set of the following:

Percent calculation work sheet

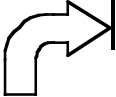
Percent error Calculations for the density lab

## Percent Error Introduction

Percent error is a way for scientist to express how far off a value is from a commonly accepted value.

The Formula :

$$\% \text{ error} = \frac{\text{Accepted Value} - \text{Experimental}}{\text{Accepted Value}} \times 100$$



Absolute value

Determine the percent error in the following problems

1. Experimental Value = 1.24 g Accepted Value = 1.30g	Answer: _____
2. Experimental Value = 252 mL Accepted Value = 225 mL	Answer: _____
3. Experimental Value = 22.2 L Accepted Value = 22.4 L	Answer: _____
4. Experimental Value = 125.2 mg Accepted Value = 124.8 mg	Answer: _____
5. Experimental Value = 11.24 cm Accepted Value = 10.25 cm	Answer: _____

Name \_\_\_\_\_ Date \_\_\_\_\_  
Period \_\_\_\_\_

### Percent error Calculations for the Density Lab

On the overhead is a list of all this class's densities for the metals

#### Substance 1

1. You identified the substance to be \_\_\_\_\_.
2. It was \_\_\_\_\_.
3. Your density \_\_\_\_\_
4. Accepted density \_\_\_\_\_
5. Percent error \_\_\_\_\_
6. The class average \_\_\_\_\_
7. What is the % error of the class average? \_\_\_\_\_
8. How does that compare to you percent error?

#### Substance 2

1. You identified the substance to be \_\_\_\_\_.
2. It was \_\_\_\_\_.
3. Your density \_\_\_\_\_
4. Accepted density \_\_\_\_\_
5. Percent error \_\_\_\_\_
6. The class average \_\_\_\_\_
7. What is the % error of the class average? \_\_\_\_\_
8. How does that compare to you percent error?

### Substance 3

1. You identified the substance to be \_\_\_\_\_.
2. It was \_\_\_\_\_.
3. Your density \_\_\_\_\_
4. Accepted density \_\_\_\_\_
5. Percent error \_\_\_\_\_
6. The class average \_\_\_\_\_
7. What is the % error of the class average? \_\_\_\_\_
8. How does that compare to you percent error?

### Substance 4

1. You identified the substance to be \_\_\_\_\_.
2. It was \_\_\_\_\_.
3. Your density \_\_\_\_\_
4. Accepted density \_\_\_\_\_
5. Percent error \_\_\_\_\_
6. The class average \_\_\_\_\_
7. What is the % error of the class average? \_\_\_\_\_
8. How does that compare to you percent error?

In what ways do you think you could improve the accuracy of density?

## Day 6 and 7- Lesson Plan - Balance Accuracy

Note: This lab with all its calculations took 2 days

Objectives:

- 1) More practice with density
- 2) More practice with volume and mass measurements

Opening:

- 1) Distribute materials

Class:

- 1) Walk through lab Directions, and safety precautions
- 2) Students perform lab. On the first day students only completed the first set of measurements and calculations.

Materials:

A class set of the following:

- Lab worksheet
- Balance
- 2 Beakers
- graduated cylinder
- Water

Rubric (based on a 20 point lab)

- |  |            |
|--|------------|
| 1) Followed all lab rules                | _____ of 4 |
| 2) Followed all directions               | _____ of 4 |
| 3) Returned all materials (cleaned)      | _____ of 4 |
| 4) Percent error for balance is accurate | _____ of 4 |
| 5) Questions                             | _____ of 4 |

Name \_\_\_\_\_ Date \_\_\_\_\_  
Period \_\_\_\_\_

### How accurate is your Balance.

**Purpose:** Use density to measure the accuracy of a balance.

**Theory:** If you know the density and the volume of a substance you can predict what the mass of the object will be.

#### Procedure:

- 1) Take the large aluminum block; find its volume by measuring its length, width and height. Record the volume on the table.
- 2) Find the volume of the same block through water displacement. Record the volume on the table.
- 3) Repeat the process of water displacement so that you have 3 volumes. Record the volume on the table.
- 4) Find the Average of the three volumes.
- 5) Use the balance to find the mass of the block. Rezero the balance and find the mass repeat once more so that you have 3 masses.
- 6) Find the average of the three masses
- 7) Use the density formula and the density of aluminum (2.70 g/mL) to find the predicted mass of the block
- 8) Find the percent error of the masses. (The predicted mass is the accepted value, the Average mass is the experimental value)
- 9) Repeat with the aluminum cube and the aluminum strip.
- 10) Average all three percent errors together.

#### Data table

Balance Number \_\_\_\_\_

#### Aluminum block

1. Length \_\_\_\_\_ Width \_\_\_\_\_ Height \_\_\_\_\_ Volume \_\_\_\_\_

2. Water level begin \_\_\_\_\_ Water level end \_\_\_\_\_ Volume \_\_\_\_\_

3. Water level begin \_\_\_\_\_ Water level end \_\_\_\_\_ Volume \_\_\_\_\_

4. Average (add the volumes together and divide by 3) Average Volume \_\_\_\_\_

5. Mass 1. \_\_\_\_\_ Mass 2. \_\_\_\_\_ Mass 3. \_\_\_\_\_

6. Average (add the masses together and divide by 3) Average Mass \_\_\_\_\_

7. Density= mass/ volume Predicted mass \_\_\_\_\_

8. (Look on the worksheet if you forget the formula) Percent Error \_\_\_\_\_

### Aluminum cube

1. Length \_\_\_\_\_ Width \_\_\_\_\_ Height \_\_\_\_\_ Volume \_\_\_\_\_
2. Water level begin \_\_\_\_\_ Water level end \_\_\_\_\_ Volume \_\_\_\_\_
3. Water level begin \_\_\_\_\_ Water level end \_\_\_\_\_ Volume \_\_\_\_\_
4. Average (add the volumes together and divide by 3) Average Volume \_\_\_\_\_
5. Mass 1. \_\_\_\_\_ Mass 2. \_\_\_\_\_ Mass 3. \_\_\_\_\_
6. Average (add the masses together and divide by 3) Average Mass \_\_\_\_\_
7. Density= mass/ volume Predicted mass \_\_\_\_\_
8. (Look on the worksheet if you forget the formula) Percent Error \_\_\_\_\_

### Aluminum strip

1. Length \_\_\_\_\_ Width \_\_\_\_\_ Height \_\_\_\_\_ Volume \_\_\_\_\_
2. Water level begin \_\_\_\_\_ Water level end \_\_\_\_\_ Volume \_\_\_\_\_
3. Water level begin \_\_\_\_\_ Water level end \_\_\_\_\_ Volume \_\_\_\_\_
4. Average (add the volumes together and divide by 3) Average Volume \_\_\_\_\_
5. Mass 1. \_\_\_\_\_ Mass 2. \_\_\_\_\_ Mass 3. \_\_\_\_\_
6. Average (add the masses together and divide by 3) Average Mass \_\_\_\_\_
7. Density= mass/ volume Predicted mass \_\_\_\_\_
8. (Look on the worksheet if you forget the formula) Percent Error \_\_\_\_\_
10. Average of all three percent errors Average Percent Error \_\_\_\_\_

### Questions.

1. Why should you make multiple measurements and average them together instead of just making one measurement?
2. What is your theory about the balances percent error? Where does it come from? What can be done to correct the problem?

## Day 8- Lesson Plan Identify the Gas Produced by the Alka-Seltzer Reaction

Objectives: 1) Use the characteristics of Carbon Dioxide to confirm that it is the gas is produced by Alka-Seltzer.

Opening: Ask the question "What gas is produced by Alka-Seltzer? How do you know?"

Class:

- 1) Hand out work sheet.
- 2) Class demo
  - a) Use Alka-Seltzer to produce Carbon dioxide. Test with a burning splint
  - b) Bubble the gas through a weak solution of Bromothymal Blue
- 3) Introduce the buoyancy Carbon Dioxide, and how the atmosphere freely mixes.
- 4) Use the rest of the class to review any concepts students are weak on

Materials:

Work Sheet

Alka-Seltzer

Test tubes

Bromothymal blue solution

## Identity of Alka-Seltzer gas

It is possible to identify a substance through the density. It is also possible to identify a substance through other characteristics.

The gas produced in the reaction of Alka-Seltzer is unknown to you. We will be doing two tests to determine the identity of the gas. Use the list of characteristics below to identify the gas. The flame test is the primary test, with the Bromothymol Blue being a secondary characteristics.

Gas	Effect on flame	Effect on Bromothymal Blue
Oxygen	Flame burns more brightly	No change
Carbon Dioxide	Flame goes out	Changes color to yellow
Hydrogen	A "pop" occurs	No change
Sulfur Dioxide	Flame goes out	No change

Effect of gas on:	Reaction
Burning Splint	
Solution of Bromothymol Blue	

Density of Carbon Dioxide is 0.00198 g/mL.

Density of Oxygen is 0.00143 g/mL

Density of Air is 0.00129 g/mL

Density of Nitrogen 0.00125g/mL

Density of Hydrogen is 0.00089g/mL

## Day 8 - Lesson Plan – Density of a gas

### Objectives:

- 1) To find the density of a gas.

### Opening:

- 1) Distribute materials

### Class:

- 1) Walk through lab Directions, and safety precautions
- 2) Students perform lab
- 3) Collect students Densities

Closing Remind student to answer lab questions for Homework.

### Materials:

A class set of the following:

- Lab worksheet
- Alka-Seltzer
- Balance
- 2 Beakers
- graduated cylinder
- Water

### Rubric (based on a 20 point lab)

- 1) Followed all lab rules \_\_\_\_\_ of 4
- 2) Followed all directions \_\_\_\_\_ of 4
- 3) Returned all materials (cleaned) \_\_\_\_\_ of 4
- 4) Densities represent conscientious work \_\_\_\_\_ of 4
- 5) Hypothesis, Conclusions and questions \_\_\_\_\_ of 4

Name \_\_\_\_\_  
Density of a Gas

Materials:

Balance	50 mL beaker
Graduated cylinder	2 Alka-Seltzer tablets
600 mL Beaker	

Procedure A – Volume of a Gas

1. Carefully break one tablet in half (do not lose any pieces). Make sure that both the whole Alka-Seltzer tablet and the half have the same mass. If they do not scrape material from the larger one until their do. (Put the whole tablet aside, someplace safe and dry)
2. Fill a graduated cylinder with water – TO THE TOP. Place your hand over the top of the cylinder, and quickly invert it into a 500 mL beaker that has approximately 250 mL of water.
3. Drop \_ the tablet into the beaker. Quickly put the cylinder over the tablet to collect the gas.
4. After the fizzing has stopped, read and record the volume of the gas that was collected.
5. Repeat all the steps for the other half tablet.
6. Add the volumes together.

Procedure B - Mass of Gas

Since finding the mass of a gas is difficult we will find it through an indirect method.

1. Fill the 50 mL beaker with approximately 20 mL of water. Place it on the balance. Place the Alka-Seltzer on the pan next to the beaker. Find the mass and record.
2. Drop the tablet into the beaker and allow it to fizz. It must be completely finished fizzing before you find the mass again. Record the mass after.

Data

Volume

1. 1<sup>st</sup> Water level begin \_\_\_\_\_
2. 1<sup>st</sup> Water level end \_\_\_\_\_
3. 1<sup>st</sup> Volume of \_ tablet \_\_\_\_\_
4. 2<sup>nd</sup> Water level begin \_\_\_\_\_
5. 2<sup>nd</sup> Water level end \_\_\_\_\_
6. 2<sup>nd</sup> Volume of \_ tablet \_\_\_\_\_
7. Total volume of gas (3+4) \_\_\_\_\_

Mass

1. Mass of beaker, water and tablet before fizz \_\_\_\_\_
2. Mass of beaker, water and tablet after fizz \_\_\_\_\_
3. Mass of gas (1-2) \_\_\_\_\_

Using the information collected what is the density of the gas? (Write the formula)

## Day 10 - Lesson Plan - Balloon Assessment

Opening:

1. Hand out test
2. Demo the 1<sup>st</sup> question (A good connection drawing hint is to have a helium balloon tied to a bottle.)

Class: Students complete the test.

Materials:

Alka-Seltzer

Balance

Balloon

Flask

Rubric - Contained in the test

Name \_\_\_\_\_ Date \_\_\_\_\_  
Period \_\_\_\_\_

Density Test - 50 points

1) (Worth 25 points)

On a balance you place a flask which contains 20 mL of water and a balloon which contains 2 Alka-Seltzer tablets. The mass is 125 g. You place the balloon on the flask and drop the tablets into the flask. The tablets begin to fizz. At first nothing changes, but as the balloon fills with gas the mass drops to 120g.

These things you know:

- 1) No gas escapes.
- 2) Your balance is accurate
- 3) The room is filled with air.

In terms of density, buoyancy and the Laws of conservation of mass and matter explain why the balance records a change in the mass. (Be sure to mention the identity of the gas, its density and the law of conservation of mass and matter)

Mass does not change		5
Not closed system		5
balloon filled with CO <sub>2</sub>		2.5
CO <sub>2</sub> density 0.00198 g/ml		2.5
Balloon floats reduces apparent mass.		5
Conservation of mass		2.5
conservation of matter		2.5

2) A block of wood has a volume of 6mL and a mass of 30 g what is the density of the block of wood? (3 points)

Formula		1
5		1
g/mL		1

3) A substance has a volume of 10 mL and a mass of 114 g. What is the density of the substance? What is the identity? (6 Points)

Formula		1
11.4		2
g/mL		1
lead		2

4) You have a block of copper. You found the density to be 7.02 g/ml. What is the accepted density? What is the percent error? (6 point)

8.96		2
Formula		1
21.65%		3

5) A block of a substance has a length of 10 cm, a width of 5 cm and 4 cm. It has a mass of 150 g. Will this substance float in water? Why? (10 points)

Yes		3
200 ml		3
.75 g/ml		4

