

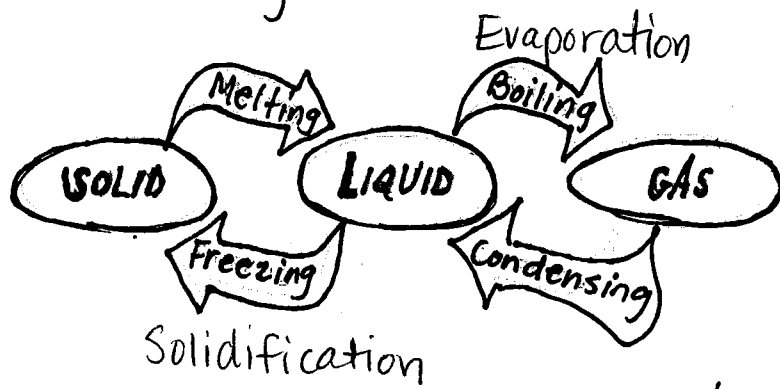
Name: \_\_\_\_\_

Block: \_\_\_\_\_

## Science 8 Chapter 4 Homework Log – The Properties of Fluids

Date	Assignment	Complete	Late
	Change of State Diagram		
	Structure of Matter Affects the Properties of Matter Worksheet		
	<del>Ice Water to Steam Lab</del> Tasty Solution		
	Paper Airplane Blueprint and Contest		
	Viscosity Lab		
	Quiz #1 - Properties of Matter	Mark =	
	Areas for improvement: Mass, Weight, Volume Lab		
	Quiz #2 - Mass, Weight Volume	Mark =	
	Areas for improvement		
	Density Worksheet		
	Density Lab		
	Quiz #3 – Density	Mark =	
	Areas for improvement		
	Buoyancy and Gravity Forces Worksheet		
	Chapter 4 Crossword		
	Chapter 4 Test	Mark=	

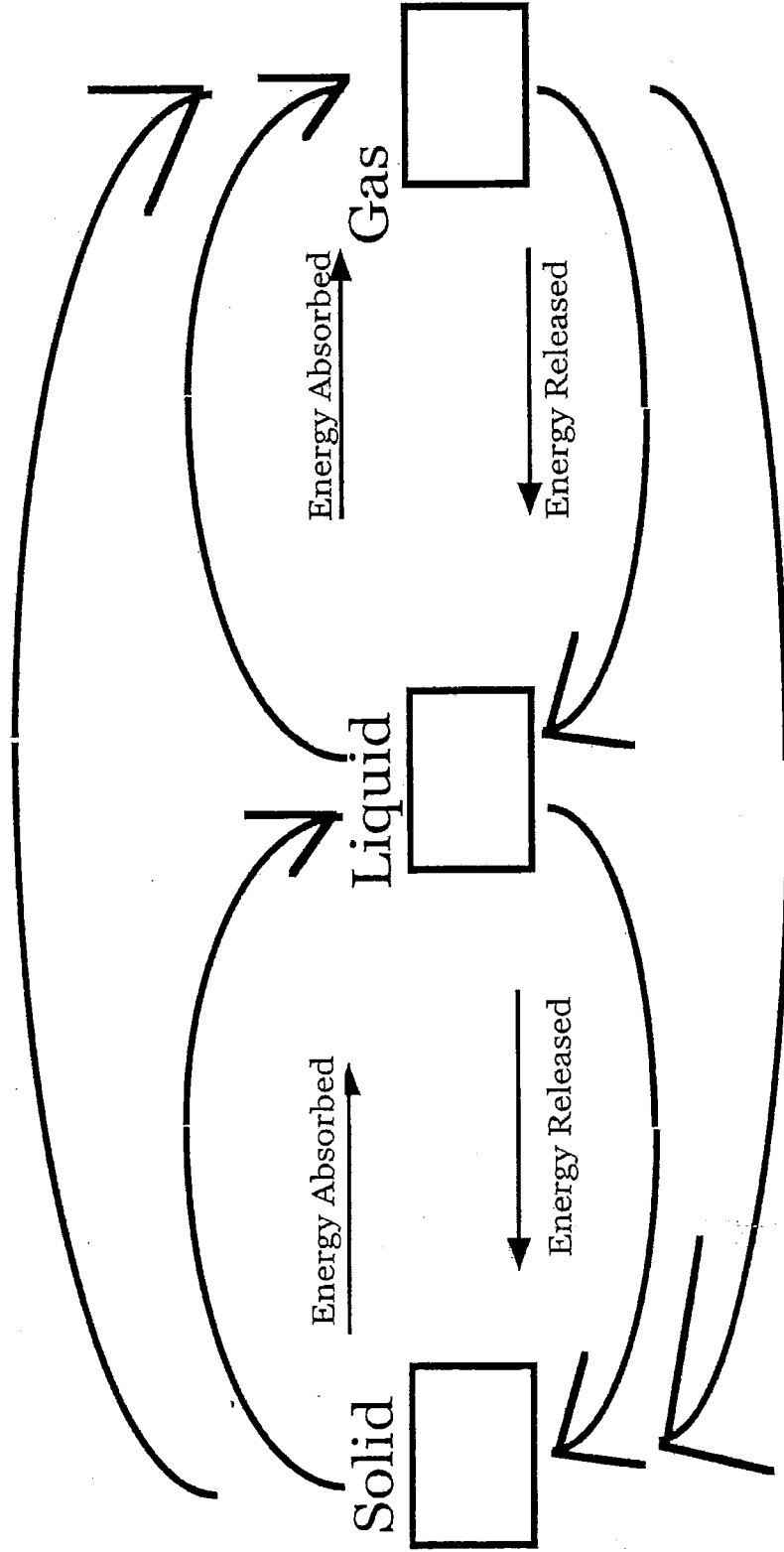
# Changes in matter



matter :- molecules & atoms  
takes up space  
- constant motion  
- held together by electrical forces

## Change of State Diagram

Label the change of state for each arrow. Think of at least one example for each change of state and write it under the arrow. In the boxes under each state, draw a small picture of how the molecules are arranged.



## Structure of Matter Affects the Properties of Matter

Please fill in the blanks.

Answers are from class lesson and pages 102 – 104 of textbook (B.C. Science Probe 8)

- 1) All matter can exist in 3 states 1) \_\_\_\_\_, 2) \_\_\_\_\_ and 3) \_\_\_\_\_.
- 2) The Kinetic Molecular Theory states:
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
- 3) An ice cube is in the \_\_\_\_\_ state.
- 4) In a solid, the particles have a low \_\_\_\_\_ level and are close together.
- 5) In a solid, the force of attraction is \_\_\_\_\_ and holds the particles together.
- 6) \_\_\_\_\_ have a definite shape and definite volume.
- 7) Describe how the particles are arranged and moving in the solid phase.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 8) The state change from a solid to liquid is called \_\_\_\_\_.
- 9) The water flowing out of the kitchen tap is in the \_\_\_\_\_ state.
- 10) Liquids have a definite \_\_\_\_\_ but not a definite \_\_\_\_\_.

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Science 8

- 11) Describe how the particles are arranged and moving in the liquid phase.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 12) The state change from a liquid to a gas is called \_\_\_\_\_.
- 13) In order for a liquid to become a gas, \_\_\_\_\_ must be added.
- 14) Gases have no definite \_\_\_\_\_ and no definite \_\_\_\_\_.
- 15) Describe how the particles are arranged and moving in the gas phase.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 16) The state change from a gas to a liquid is called \_\_\_\_\_.
- 17) The state change from a liquid to a solid is called \_\_\_\_\_.
- 18) Dry ice (carbon dioxide in the solid state) changing directly into a gas is called \_\_\_\_\_.
- 19) As energy is added to matter, the motion of the particles \_\_\_\_\_ and the forces of attraction \_\_\_\_\_.

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Name: \_\_\_\_\_

**Bill Nye- Phases of Matter movie**

1. What is matter? \_\_\_\_\_
2. What is the universe made up of? \_\_\_\_\_
3. Name the 3 phases of matter. \_\_\_\_\_
4. What does it take to get solids to liquids and liquids to gas? \_\_\_\_\_
5. Where could you put the matter when you want to take energy away?  
\_\_\_\_\_
6. Where does the heat go when a liquid turns into a solid? \_\_\_\_\_
7. What percentage of our air is nitrogen? \_\_\_\_\_
8. When molecules slow down they get \_\_\_\_\_ together and when they heat up they move \_\_\_\_\_ apart.
9. What is absolute zero? \_\_\_\_\_
10. Solids \_\_\_\_\_ and \_\_\_\_\_ their shape.
11. Liquids \_\_\_\_\_ and take the shape of their \_\_\_\_\_.
12. Gas \_\_\_\_\_ and takes the shape of their \_\_\_\_\_.

# SCIENCE LAB CRITERIA & MARKING SHEET



**ASSIGNMENT NAME:** \_\_\_\_\_

**NAME:** \_\_\_\_\_ **BLOCK:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

CATEGORY	4	3	2	1	Self	Peer
<b>Hypothesis (if required)</b>	Hypothesis has been stated and appears reasonable. Justification for the hypothesis is stated.	Hypothesis has been stated and appears reasonable.	Hypothesis has been stated, but appears to be based on flawed logic.	No hypothesis has been stated.		
<b>Results and Observations</b>	Results include 3 of the following: - data are organized - units are included - data are accurate	Results include 2 of the following: - data are organized - units are included - data are accurate	Results include 1 of the following: - data are organized - units are included - data are accurate	Data are not recorded		
<b>Discussion Questions</b>	-All questions answered in complete sentences. -All answers are correct -Uses appropriate science vocabulary	-All questions answered in complete sentences. -Answers contain small errors	-Questions are answered in complete sentences but contain many errors. -Questions are answered correctly but not in complete sentences.	-One or more questions are missing. -Little thought or effort put into answers.		
<b>Conclusion (paragraph of a minimum 3 sentences)</b>	Conclusion contains 3 of the following: - addresses the question contained in the purpose (or as asked in the lab) - includes whether the findings supported the hypothesis, possible sources of error	Conclusion contains 2 of the following: - addresses the question contained in the purpose (or as asked in the lab) - includes whether the findings supported the hypothesis, possible sources of error	Conclusion contains 1 of the following: - addresses the question contained in the purpose (or as asked in the lab) - includes whether the findings supported the hypothesis, possible sources of error	No conclusion was included in the report OR shows little effort and reflection.		
<b>Appearance &amp; Organization</b>	2 Contains 6 of the following: - name, block, & date underlined headings and sub-headings in correct order - all lines drawn with a ruler - neatly printed or typed - no doodling, messy cross-outs, tears, or creases - pages stapled in correct order	1.5 Contains 5 of the following: - name, block, & date underlined headings and sub-headings in correct order - all lines drawn with a ruler - neatly printed or typed - no doodling, messy cross-outs, tears, or creases - pages stapled in correct order	1 Contains 4 of the following: - name, block, & date underlined headings and sub-headings in correct order - all lines drawn with a ruler - neatly printed or typed - no doodling, messy cross-outs, tears, or creases - pages stapled in correct order	0.5 Contains less than 4 of the following: - name, block, & date underlined headings and sub-headings in correct order - all lines drawn with a ruler - neatly printed or typed - no doodling, messy cross-outs, tears, or creases - pages stapled in correct order		
<b>Spelling, Punctuation, &amp; Grammar</b>	No noticeable errors.	Small number of errors which do not distract the reader or adversely affect the clarity of the lab.	Several errors which distract the reader from the content of the lab. Meaning is still clear.	Errors are distracting to the reader to the point that the lab becomes confusing or lacks clarity.		

**COMMENTS:** \_\_\_\_\_

**FINAL SCORE:**

20

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Activity 4.4 - Viscosity: From Thick to Thin

Question:

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Hypothesis:

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Procedure: see pp. 110 - 112 in Science Probe 8 and listen to Mr. H.'s instructions

Results & Observations:

Oil Temperature	5 - 8°C	20 - 24°C	45 - 50°C
Time			
Flow Rate			
Appearance			

**Analysis Questions:** On a separate piece of paper, answer questions c - g on page 112 of the text. Staple the answer sheet to this lab page.

Conclusion:

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Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Science 8 Mass, Weight and Volume Station Lab

You will probably find Section 4.5 and the Skills Handbook in the text a valuable resource for completing this lab. Have these sections open as you move about.

*Remember to include units for all answers!*

### Station 1 – Mass of a solid

1. The mass of the object is \_\_\_\_\_
2. The mass of this object on the moon is \_\_\_\_\_
3. Weight is the force of gravity acting on an object and is measured in Newtons (N). The formula for weight is **Weight = mass x gravity** (gravity is  $9.8 \frac{m}{s^2}$  ~~ms~~ <sup>kg/N</sup>)  
The weight of the object on earth is \_\_\_\_\_
4. The weight of this object on the moon is \_\_\_\_\_

### Station 2 – Mass of a liquid

1. Use the materials at this station to determine the mass of 80 ml of water. You may have to do a little thinking for yourself... you can do it!

Mass of 80 ml of water is \_\_\_\_\_

### Station 3 – Volume of a liquid

1. What is the name of the piece of glassware you will be using to measure the volume of water? \_\_\_\_\_
2. Where should your eyes be in order to make an accurate volume reading?  
\_\_\_\_\_
3. What is the name given to the curved surface of the liquid in the glassware?  
\_\_\_\_\_
4. This curved surface is caused by (cohesion / adhesion) of the water molecules to the surface of the glassware (circle one).



5. The volume of water provided to us is \_\_\_\_\_ (remember to include units).

**Station 4 – Volume of a rectangular solid**

1. What mathematical formula can you use to determine the volume of the solid object at this station?

The formula is \_\_\_\_\_

2. Use the materials provided to determine the volume of the object provided.

The volume of the object is \_\_\_\_\_.

**Station 5 – Volume of a small irregular solid**

1. Use the displacement of water method to determine the volume of the small irregular solid at this station.

Initial volume of water in the glassware \_\_\_\_\_

Combined volume of the object and water \_\_\_\_\_

Volume of the object \_\_\_\_\_

**Station 6 – Volume of a large irregular solid**

1. Use the overflow method to determine the volume of the large irregular solid at this station.

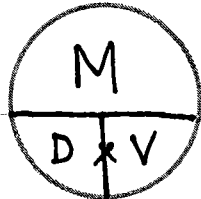
Volume of water which spills out of the container \_\_\_\_\_

Volume of the object \_\_\_\_\_

Name: \_\_\_\_\_ Calculating Density Notes

Formula:  $D = \frac{M}{V}$

D = density	- g/mL or g/cm <sup>3</sup>
M = mass	- g or kg
V = volume	liquid - L/mL solid - cm <sup>3</sup>



To find the other formulae, put your finger over the value (letter) you are trying to find. The formula will be revealed.

ie. Cover the M -----  $M = D \times V$

ie. Cover the V -----  $V = \frac{M}{D}$

Try this example:

If the mass of 30 mL of milk is 60 g, what is the density?

$D = \frac{M}{V}$       $D = \frac{60 \text{ g}}{30 \text{ mL}}$       $D = \frac{2 \text{ g}}{\text{mL}}$      \*\*\*\*note the units

And more:

What is the mass of a piece of wood whose volume is 80L and density is .8 kg/L?

$M = D \times V$       $M = .8 \text{ kg/L} \times 80 \text{ L}$       $M = 64 \text{ kg}$

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Density Worksheet

*Show all work when answering the following questions.*

1. What is the density of a solid which has a mass of 786 g and a volume of 100 cm<sup>3</sup>?
  
2. What is the density of a solid which has a mass of 44.75 g and a volume of 5 cm<sup>3</sup>?
  
3. What is the volume of a substance which has a mass of 100 g and a density of 20 g/ml?
  
4. What is the mass of a substance which has a volume of 200 ml and a density of 20 g/ml?
  
5. If a metal has a mass of 210 g and its density is 7 g/ml, what is its volume?
  
- 6a.
  - Mass of empty beaker = 60.44 g
  - Mass of beaker and liquid = 129.74 g
  - What is the mass of the liquid?
  
- 6b. If the volume of this liquid is 55 ml, what is its density?

7a. Dimensions of a block: length = 10 cm, width = 6 cm, height = 0.5 cm.  
What is the volume?

7b. If the block has a mass of 210 g, what is its density?

8a. Dimensions of a block: length = 10 cm, width = 6 cm, height = 3 cm.  
What is the volume?

8b. If the block has a density of  $45 \text{ g/cm}^3$ , what is the mass?

9a. Dimensions of a block: length = 8 cm, width = 1.5 cm, height = 0.5 cm.  
What is the volume?

9b. If the mass of the block is 2 g, what is the density?

10. Using the table on page 122 of your textbook and the densities you calculated, find the identities of the substances in questions 1, 2, and 6 on the previous page.

• #1 \_\_\_\_\_

• #2 \_\_\_\_\_

• #6 \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Blk: \_\_\_\_\_

## Density Block Lab

**Purpose:** To discover the relationship that determines whether a material will sink or float when placed in water.

### Hypothesis:

Fill in the following table based upon your observations of the density cubes and the list of possible substances in the density chart:

Block #	What is this Substance?	Reason for your choice	Will it sink or float in water?	Reason for your choice
1				
2				
3				
4				
5				
6				
7				
8				
9				

### Procedure:

1. Using a ruler and balance, fill in the appropriate data for the "mass", "length", "width", and "height" columns of each unknown cube.
2. Use the formula  $V = l \times w \times h$  to determine the volume of each cube.
3. Use the formula  $D = m / v$  to determine the density of each cube.
4. Use your calculated density and the density chart to determine the identity of each unknown cube.

5. Place each cube in water and record whether it sinks or floats.  
Record your observations in the appropriate data table.

Results & Observations:

Block #	Mass (g)	Length (cm)	Width (cm)	Height (cm)	Volume (cm <sup>3</sup> )
1					
2					
3					
4					
5					
6					
7					
8					
9					

Block #	Density (g/cm <sup>3</sup> )	Substance Identity	Sink or float in water?	Density of water (g/ml)
1				
2				
3				
4				
5				
6				
7				
8				
9				

Discussion:

1.
  - a. What kind of graph (broken line, bar, or circle/pie) would be most appropriate to visually represent the densities of the different substances?
  - b. Create the kind of graph you decided upon using the data from the tables in the results section.

2. Why is it scientifically incorrect to say that air is **light** compared to wood and steel is **heavy** compared to PVC plastic? How could you rewrite this sentence more accurately?

3. Without actually performing the experiment, how could you determine if a given substance would sink or float in water?

**\*Challenge\*** Many ships are built out of steel which, as we discovered in our lab, sinks in water. How is it that these ships appear to defy the principle of density?

**Conclusion:**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

### Try This: Buoyancy and Gravity Forces

Procedure: page 128 - Science Probe 8

Observations:

1. Weight of modelling clay in air = \_\_\_\_\_
2. Weight of modelling clay in water = \_\_\_\_\_
  - a. The modelling clay has a greater weight in air / water (circle one)
  - b. Buoyant force acting on the clay = weight in air - weight in water

Record the calculation on the line below:

\_\_\_\_\_

Buoyant force acting on the clay = \_\_\_\_\_ (remember units)

The lump of clay sank in the water because the force of gravity... \_\_\_\_\_

3. The weight "in air" of the new "floating" shape of clay = \_\_\_\_\_
4. Can you find the weight in water of the floating shape of clay - while it is floating? Explain. \_\_\_\_\_
5. How does the shape of the floating clay differ from the shape that sank? \_\_\_\_\_
6. What affect does the shape have on buoyant force? Use Archimedes Principle to defend your answer. \_\_\_\_\_

Name: \_\_\_\_\_ Date: \_\_\_\_\_

### Try This: Buoyancy and Gravity Forces

Procedure: page 128 - Science Probe 8

Observations:

1. Weight of modelling clay in air = \_\_\_\_\_
2. Weight of modelling clay in water = \_\_\_\_\_
  - a. The modelling clay has a greater weight in air / water (circle one)
  - b. Buoyant force acting on the clay = weight in air - weight in water

Record the calculation on the line below:

\_\_\_\_\_

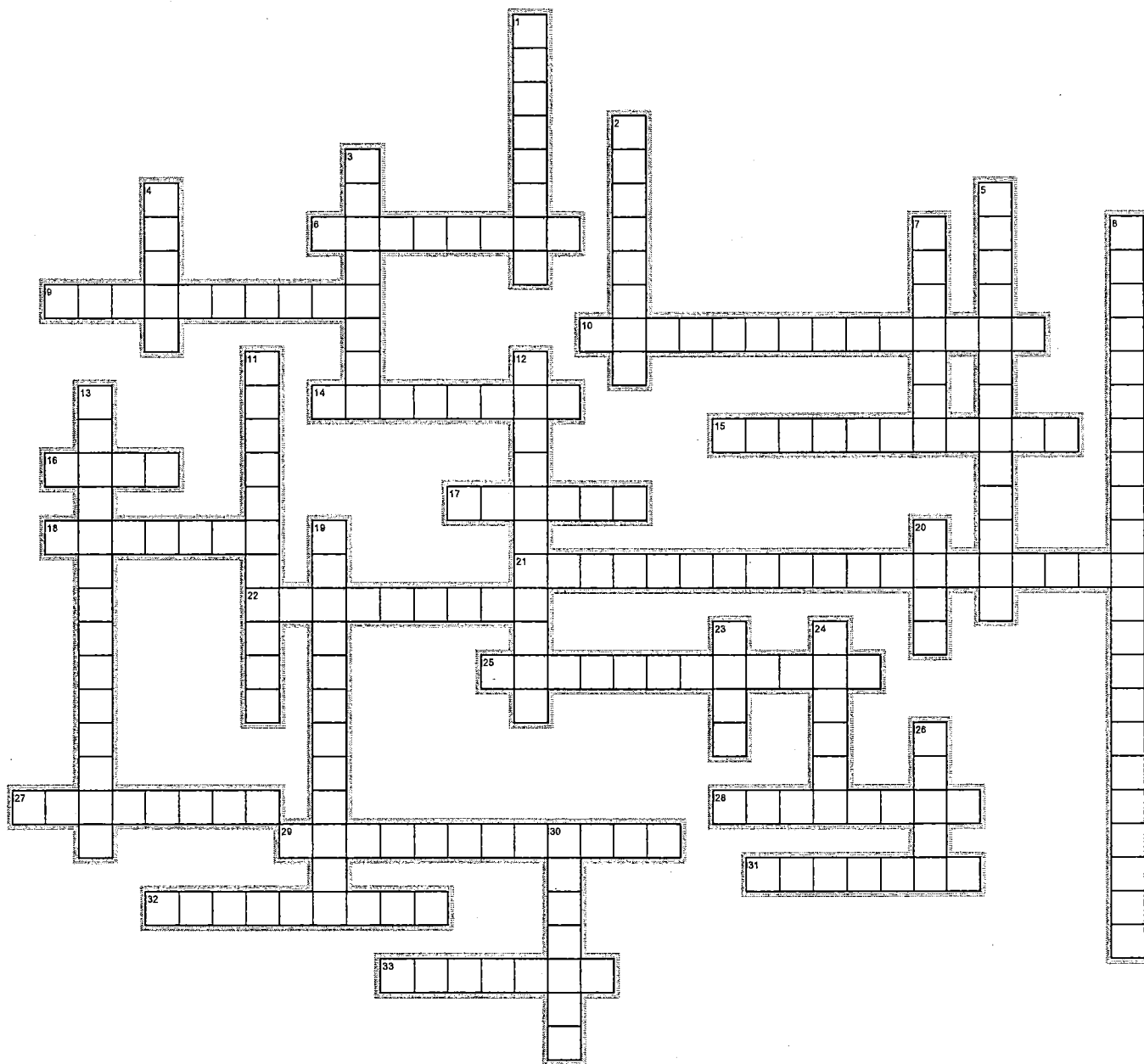
Buoyant force acting on the clay = \_\_\_\_\_ (remember units)

The lump of clay sank in the water because the force of gravity... \_\_\_\_\_

3. The weight "in air" of the new "floating" shape of clay = \_\_\_\_\_
4. Can you find the weight in water of the floating shape of clay - while it is floating? Explain. \_\_\_\_\_
5. How does the shape of the floating clay differ from the shape that sank? \_\_\_\_\_
6. What affect does the shape have on buoyant force? Use Archimedes Principle to defend your answer. \_\_\_\_\_



# Chapter 4 Crossword



EclipseCrossword.com

## Across

- |  |   |
|--|---|
| <p>6. the type of buoyancy where a substance tends to rise in a fluid</p> <p>9. an instrument which measures viscosity</p> <p>10. the change of state from a liquid to a solid</p> <p>14. the curved surface found where a liquid contacts the walls of its container</p> <p>15. describes an object which is shaped to reduce drag</p> <p>16. a force which acts to slow an object moving through a fluid</p> | <p>17. the force of gravity on an object</p> <p>18. the type of flow which occurs when fluids travel in straight, or almost straight lines</p> <p>21. the idea that the buoyant force exerted on an object immersed in a fluid is equal to the weight of the amount of fluid that the object displaces</p> <p>22. type of flow which occurs when fluids move in irregular patterns, not in straight lines</p> <p>25. the change of state from a gas to a liquid</p> <p>27. the upward force exerted by a fluid on an object</p> <p>28. the force of attraction between the particles in a substance</p> |
|--|---|

# Chapter 4 Crossword

## Across

29. the volume of fluid moved when a solid object is placed in that fluid
31. the amount of mass per unit volume of a substance
32. the resistance of a fluid to flow or movement
33. a word used to describe systems which involve movement

## Down

1. describes buoyancy where an object tends to sink in a fluid
2. the force of attraction between particles of a fluid and the particles of another substance
3. the speed at which a fluid moves
4. a push or a pull
5. the motion of liquids around solid objects
7. the type of buoyancy where a substance tends to remain stationary or at a constant level while floating in a fluid
8. the idea that matter is made of particles which are in constant motion
11. the change of state from a liquid to a gas
12. the change of state from a solid directly to a gas (or vice versa)
13. increased attraction of particles at the surface of a liquid
19. air or gas moving around solid objects
20. a more dense substance will tend to \_\_\_\_\_ in a less dense fluid
23. the amount of matter in an object
24. the amount of space an object occupies
26. a less dense substance will tend to \_\_\_\_\_ in a more dense fluid
30. the change of state from a solid to a liquid