Guided Lesson Notes

Name:_____ **Date:**_____

Fluids

Directions: Complete this study guide as you move through the lesson. By taking notes, you are more likely to remember what you are learning. The completed study guide can be used for practice activities and to prepare for quizzes and exams. Be sure to save each study guide so you can access it when you need it.

Essential Vocabulary

As you encounter these scientific terms in the lesson, enter the meaning and an example (or two) for each. You can even draw a picture. If there are other unfamiliar words you find, enter them in the blank spaces provided.

fluid	*Archimedes' principle*
buoyancy	*Pascal's principle*
density	*fluid pressure*

Liquids and Gases

1. **List the key properties of the three main states of matter.**

State of Matter	Properties
Solid	
Liquid	
Gas	

2. **What properties of liquids and gases allow them to be considered fluids?**

3. **Why is density not constant for a gas, though it is for a liquid and a solid?**

Fluid Pressure

1. **Which three properties of a fluid determine its fluid pressure?**

2. **Write the equation for fluid pressure. Define all variables.**

Equation:	
$P =$	
$\rho =$	
$g =$	
$h =$	

3. **What common property of a fluid is NOT a factor in determining its fluid pressure?**

Fluid Pressure Practice

Select one of the problems listed and complete the table with the appropriate information. Choose from: Pipes, Gasoline, **or** Unknown Substance.

Problem:	

Picture	Given/Find	Equation	Solution

Archimedes' Principle

1. **Why do you feel lighter when playing in a swimming pool than when you are walking around on land?**

2. **State the Archimedes' principle in words.**

3. **Write the Archimedes' principle mathematically. Define all variables.**

Equation:	
$F_B =$	
$\rho_f =$	
$V =$	
$g =$	

4. **Write the equation that relates the buoyant force to the weight of the displaced fluid.**

5. **Sketch the free body diagram that shows a soccer ball floating in water. Identify and label all forces acting on the ball.**

6. **Fill in the blanks below about the buoyant force.**

Buoyant force is equal to _____ minus _____ _____.

7. **Complete the table below representing three possible scenarios for buoyant force.**

$F_B > F_g$	

Archimedes' Principle Practice

1. **Write out the three versions of the Archimedes' principle as it pertains to buoyant force.**

1	
2	
3	

2. **Select one of the problems listed and complete the table with the appropriate information. Choose from:** Iron, 5.89 kg, Alphonso, **or** Brass.

Problem:	

Picture	Given/Find	Equation	Solution

Sink or Float

1. **Under what conditions will an object sink in a fluid? Float in a fluid?**

Sink	Float

2. **What are the three (simple) rules for deciding whether an object will sink or float?**

1	

2	
3	

3. **If you were to pour maple syrup into a glass of water, what would it do and why?**

Sink or Float Practice

1. **Identify the materials in the list that will float in water and those that will sink in water.**

   cement, coconut oil, maple syrup, iron chips, lima beans, ice, unshelled peanuts, sandstone

Sink in Water	Float in Water

2. **What property of each of these materials did you use to decide whether they would sink or float?**

Pascal's Principle

1. **Write Pascal's principle out in words.**

2. **Briefly explain how a hydraulic lift works and how it uses Pascal's principle.**