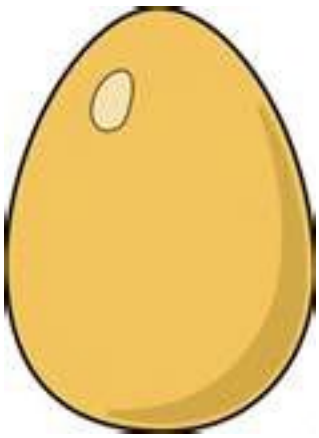

Egg in the Bottle Experiment

Problem: How can gases be used to pull a hard boiled egg into a glass or plastic bottle?

Materials: 2 hard boiled eggs, 1 glass bottle, 1 plastic bottle, paper towel (for peeling the egg), scrap paper, a lighter, a pair of scissors.

MAXIMUM SIZE OF PAPER TO BE LIT ON FIRE: approx 2cm x 6cm. Please do not light the paper towel on fire ☺

Hypothesis: (Use the If …. Then format)

Procedure (point form)

Was your hypothesis correct?

Questions

1. State the four parts of the particle model of matter

2. What happens molecules and atoms (particles) in gases when they are heated?

3. What happens to molecules and atoms (particles) in gases when they cool?

4. What happens to the pressure inside the jar when the egg seals its opening and the paper is still burning?

5. What happens to the pressure inside the jar when the egg seals its opening and the fire goes out?

6. What causes the egg to “bounce” on top of the jar before sealing the jar and eventually being pulled in? Why is this important for the egg to be pulled in?

Application Questions: Use what you know about the particle model of matter, as well as what you have learned in this lab to answer the following questions:

7. Draw a sketch of how a sugar cube dissolves in a cup of coffee. Be sure to include arrows showing the movement of the coffee particles as well as the sugar particles

8. Would a sugar cube dissolve more quickly in hot or cold water? Explain why.

9. Aside from changing the temperature, list two other ways to make a sugar cube dissolve faster in coffee.

10. Use this chart to help you think of one additional example for each type of solution. Write your example to the right of each row.

Examples of Common Solutions

Solute	Solvent	Solution	Additional Example:
gas	gas	air (oxygen and other gases in nitrogen)	
gas	liquid	soda water (carbon dioxide in water)	
liquid	liquid	antifreeze (ethylene glycol in water)	
liquid	solid	rubber cement (benzene in rubber)	
solid	liquid	seawater (salt and other substances in water)	
solid	solid	brass (zinc and copper)	

11. Solubility refers to the maximum amount of solute that a given volume of solvent is able to dissolve. List the only three ways to change solubility of a given solute. *For example, what are three ways to increase the amount of Kool-Aid crystals that could be dissolved in 500mL of solvent?*

12. Why is water called the "Universal Solvent?"

13. Refer to the following table to answer:

Solubility in g/100 mL of Water		
Substance	***at 0°C***	***at 100°C***
sodium chloride	*35*	*39*
sodium nitrate	*74*	*182*
sodium carbonate decahydrate	*21*	*421*

a. Which substance has the greatest solubility at zero degrees Celsius?

b. Which substance has the greatest solubility at one hundred degrees Celsius?

c. Which substance exhibits the greatest change in solubility between zero and one hundred degrees Celsius?