Physical Science **Name_____**
Lab 1.1 **Partner_____**

Part 1 GASES:

The purpose of this part of the experiment is to discover the characteristic properties of three gases.

A. **LIT splint test** looks for the presence of hydrogen.

1. One partner should light a wooden splint.
2. The other partner will hold the test tube **upside down**, and remove the stopper.
3. Place the lit splint near the mouth of the test tube.
4. Record your observations in the box below.

OBSERVATIONS:

ANALYSIS: (Why was the tube held upside down?)

CONCLUSION: (Was hydrogen present? Answer in a complete sentence Mention the term **characteristic property**.)

B. **GLOWING splint test** looks for the presence of oxygen.

1. One partner should light a splint and wave it gently so that no flame is visible, but the splint should still glow.
2. The other partner will hold the test tube **right side up**, and remove the stopper.
3. Place the glowing splint into the test tube.
4. Record your observations in the box below.

OBSERVATIONS:

ANALYSIS: (Why was the tube held right side up?)

CONCLUSION: (Was oxygen present? Answer in a complete sentence. Mention the term **characteristic property.**)

C. LIMEWATER test looks for the presence of carbon dioxide.

1. One partner should get the limewater.
2. The other partner will hold the test tube **right side up**,  and remove the stopper.
3. Place 3-4 drops of limewater into the test tube.
4. Record your observations in the box below.

OBSERVATIONS:

ANALYSIS: (Why was the tube held right side up?)

CONCLUSION: (Was CO_2 present? Answer in a complete sentence. Mention the term **characteristic property**)

Part 2 LIQUIDS:

The purpose of this part of the experiment is to discover the characteristic properties of water and *group characteristic* properties of certain types of liquids.

A. **Cobalt Chloride test** looks for the presence of water in a pure sample or in a mixture. ***If water is present the blue paper will turn PINK.***

1. Place a small piece of blue cobalt chloride paper into each of the following and record your observations.

LIQUID	OBSERVATION
HCl (hydrochloric acid)	
Vinegar (acetic acid)	
Tap Water	
NaOH(sodium hydroxide)	
$Ca(OH)_2$(limewater)	
NaCl(salt water = brine)	

CONCLUSION: (Which contain water?.)

B. **Litmus test** looks for the presence of either base or acid.

- Acids have no effect on red litmus but they turn blue litmus red.
- Bases have no effect on blue litmus but turn red litmus blue.
- Water(neutral) and neutral slats have no effect on any litmus.

1. Test each substance with **both** red and blue litmus. For example add a small piece of red litmus to HCl. Then to a fresh sample of HCl add blue litmus.

LIQUID	**OBSERVATIONS with**	
	BLUE LITMUS	**RED LITMUS**
HCl		
Vinegar		
Tap Water		
NaOH(sodium hydroxide)		
$Ca(OH)_2$(limewater)		
NaCl(salt water = brine)		

CONCLUSION: (If stuck see notes on top of page.)

The acids were_____.

The bases were _____.

The neutral substances were_____.

C. Conductivity is a group characteristic of electrolytes. The stronger the electrolyte, the better it conducts (because of the presence of charged atoms called ions.)

1. Test each substance with the conductivity apparatus. Make sure both electrodes touch the liquid, and mention whether there is no glow, a dim glow or a bright glow.

LIQUID	**OBSERVATION**
HCl (hydrochloric acid)	
Vinegar (acetic acid)	
Tap Water	
NaOH(sodium hydroxide)	
$Ca(OH)_2$(limewater)	
NaCl(salt water = brine)	

CONCLUSION: Which liquids were the strong electrolytes?

Part 3 SOLIDS:

The purpose of these tests is to identify metals based on their ***group characteristics***: malleability, shininess, conductivity and reaction with acid.

A. APPEARANCE test.

1. For each solid note the following:
   - Is the solid lustrous(shiny) like a metal?
   - Is it malleable (bendable instead of granular)?

SOLID	**OBSERVATION**	
	LUSTROUS?	**MALLEABLE?**
Mg (magnesium)		
C (graphite)		
Zn (zinc)		
$CaCO_3$ (limestone)		
$C_{12}H_{22}O_{11}$(sugar)		
NaCl(salt)		

B. CONDUCTIVITY test. **Use the flat pieces of Mg, C and Zn**

1. Test the conductivity of each solid and record your results.

SOLID	**OBSERVATION**
Mg (magnesium)	
C (graphite)	
Zn (zinc)	
$CaCO_3$ (limestone)	
$C_{12}H_{22}O_{11}$(sugar)	
NaCl(salt)	

C. ACID test. **Use the powdered forms of Mg, C and Zn**

1. Add acid to each solid to see if any gas is released.

SOLID	**OBSERVATION**
Mg (magnesium)	
C (graphite)	
Zn (zinc)	
$CaCO_3$ (limestone)	
$C_{12}H_{22}O_{11}$(sugar)	
NaCl(salt)	

CONCLUSION:
Which substances had ***all four*** of these results? They were lustrous, malleable, conductive and they reacted with acid. _____
What group of substances do they belong to?_____