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

**Title:** Unit 3: Properties of Matter

**Purpose:**

* Practice lab safety
* Practice using varied measurement tools
* Identify significant figures and uncertain figures
* Identify physical and chemical reactions/ mixtures and pure substances

**Procedure:**

* Practicing lab safety concepts and strategies: ATTITUDE and ATTIRE
* In each of 4 stations, follow the directions CLOSELY using varied tools with varied precision. Note measurements to the correct number of significant figures.
* Draw/ take picture of observations including tools, precision notches and objects.

**Observations:** Make careful observations by identifying EVERYTHING you do and recording EVERYTHING you measure. Draw/ take pics of it.

|  |  |
| --- | --- |
|  |  |
|  |  |

**Questions:** Ask any questions that arise about the reaction/ procedure

1-

2-

3-

4-

**Analysis:** Analyze data by identifying the changes. (N/A if not applicable)

Physical or chemical?

If physical is it extrinsic/ intrinsic?

If chemical can you identify it as neutralization/ combustion/ oxidization?

Mixture or pure substance?

If it is a mixture, is it homogeneous/ heterogeneous?

If it is a pure substance, is it element or compound?

**Results and Discussion:** Address the purposes and observations, questions and analysis.

**Station 1 Slime**

Safety: apron, gloves, goggles

Borax solution: add 1g of borax to 10 ml water and stir until dissolved in solution: (Na2B4O7•10H2O)

Change: In a 250 mL beaker, add 50 mL of Polyvinyl alcohol (PVOH) solution.

Add 5 mL of borax solution and mix vigorously with a wooden stirrer until an observable change occurs. Na2B4O7•10H2O + PVOH - >

Clean up: Clean any counter spills with brown paper. Keep or discard slime in a contained location. Rinse glass wear thoroughly. Discard wooden stir stick in the garbage.

**Station 2 Neutralization of an acid**

Safety: goggles

Change: In a 250 mL beaker, add 50 mL of vinegar (acetic acid)

NaHCO3(s) + CH3COOH(l)  CO2(g) + H2O(l) + Na CH3COO(aq)

With a wooden stir stick, add sodium bicarbonate to the vinegar and stir until a change is observed. \*Do not contaminate the powder by using the same stick twice.

Clean up: Clean any counter spills with brown paper. Discard neutralized solution down the sink. Rinse glass wear thoroughly. Discard wooden stir stick in the garbage.

**Station 3 Boiling water**

Safety: hot plate safety behaviour, goggles

Change In a 125 mL Erlenmeyer flask add 50 mL of water (H2O(l)) (and a few drops of food colouring if you want!**\*\*\*stains\*\*\***) and turn the hot plate up to half-way until an observable change occurs.

Clean up: Do not clean up this station

**Station 4 Acid/ base indicators**

Safety: apron, gloves, goggles

Change: In a 25 mL beaker, add 20 mL of vinegar (acetic acid). In another beaker add 20 ml of water (neutral) and stir until it’s in solution. Add 15 ml of 0.1M NaOH solution (strong base) to a third beaker**\*\*\*corrosive\*\*\*.** Add four drops of phenolphthalein indicator (base) to each beaker until observable change occurs.

Clean up: Clean any counter spills with brown paper. Discard solutions down the sink. Rinse glass wear thoroughly.

**Analysis:** Analyze data by identifying the changes. (N/A =if not applicable)

**Station 1**

Physical or chemical: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If physical is it extrinsic/ intrinsic: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If chemical can you identify it as neutralization/ combustion/ oxidization: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Mixture or pure substance: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If it is a mixture, is it homogeneous/ heterogeneous: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If it is a pure substance, is it element or compound: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Station 2**

Physical or chemical: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If physical is it extrinsic/ intrinsic: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If chemical can you identify it as neutralization/ combustion/ oxidization: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Mixture or pure substance: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If it is a mixture, is it homogeneous/ heterogeneous: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If it is a pure substance, is it element or compound: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Station 3**

Physical or chemical: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If physical is it extrinsic/ intrinsic: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If chemical can you identify it as neutralization/ combustion/ oxidization: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Mixture or pure substance: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If it is a mixture, is it homogeneous/ heterogeneous: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If it is a pure substance, is it element or compound: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Station 4**

Physical or chemical: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If physical is it extrinsic/ intrinsic: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If chemical can you identify it as neutralization/ combustion/ oxidization: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Mixture or pure substance: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If it is a mixture, is it homogeneous/ heterogeneous: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If it is a pure substance, is it element or compound: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_