**Investigation #1: Vinegar and Baking Soda**

Procedure

1. Set-up: Put 10g (1 tsp—white spoon) of baking soda into the balloon, using the funnel. Remove the funnel and clean the inside of funnel with a paper towel. Set the balloon in the middle of the table.
2. Measure 15 mL of vinegar (from teacher), using the graduated cylinder.
3. Using the CLEAN funnel, pour the vinegar into the small flask.
4. Record observations and discussions of the baking soda and vinegar under the “Before Observation” column. Using indicators—what does each substance look like? Smell? Temp? Feel-for baking soda only, etc…. Draw a sketch of what the flask and balloon looks like as well. After all group members have discussed and recorded their observations, continue.
5. While one group member holds the flask, stretch the opening of the balloon over the mouth of the small flask. Make sure that none of the baking soda gets into the flask.
6. Holding the flask and balloon upright, empty the baking soda from the balloon into the flask. Hold the balloon onto the flask tightly so it does not fall off.
7. Observe the balloon and flask for the next 5 minutes. During this time, touch the outside of the flask from time to time to make observations of any temperature changes. Record your observations. Make sure to record the different you see in the flask and the balloon, as well as any temperature changes you might feel. Draw a sketch (and label) of the flask and balloon during the investigation.
8. After 5 minutes, record what you think happened to the baking soda/vinegar under the “After Observations” column. Explain your reasoning.
9. Clean up your investigation area carefully. \*\*Remove the balloon from the flask by peeling the balloon slowly away from you or any other group member.\*\* Be sure all materials are rinsed off, put back into your tub in an organized manner and the table is clean.

**Investigation #2: Vinegar, Copper Pennies and Salt**

Procedure

1) Examine your pennies and record your observations of their appearance in the “Before Observation” column.

2) Using the graduated cylinder, measure 25 mL of vinegar, and pour it into the plastic cup.

3) Measure about 5g (1/2 tsp) of salt. Add the salt to the vinegar and stir with the clear spoon-labeled “Stir Spoon” until the salt dissolves.

4) Place the 2 of the coins in the salt-vinegar solution. Leave the 3rd coin out for a “control” penny.

5) Observe the cup/pennies for the next 5 minutes. During this time, touch the outside of the cup from time to time to make observations of temperature changes. Record your observations under the “During Observation” column. Make sure to record any changes you see in the liquid and the pennies, as well any temperature changes you might feel.

6) Using the “Stir Spoon,” remove the coins from the salt and vinegar solution. Rinse them with water and place them on a paper towel to dry.

7) Examine the pennies, and record what they look like. Note any differences between the way the coins look now and the way they looked before they were put into the solution. Record observations in the “After Observations” column.

8) Clean up your investigation area carefully. Be sure all materials are rinsed off, put back into your tub in an organized manner and the table is clean. Please acquire two more pennies for the next class and return your used pennies to your teacher.

**Investigation #3: Vinegar, Salt, and Metals**

Procedure:

1) Examine the nails. Record your observations of how they look under the “Before Observation” column.

2) Using the graduated cylinder, measure 25 mL of vinegar, and pour the vinegar into the plastic cup.

3) Measure about 10g (1 tsp) of table salt. Add it to the vinegar and stir with the spoon labeled “Stirring Spoon” until the salt dissolves.

4) Place three nails in the salt-vinegar solution. Lean one of the rusted nails against the side of the cup so only about ½ of it is in the solution and wait/observe for about 5 minutes. During the time, record any observations of the nails or temperature changes by feeling the cup sides. Record these observations under the “During Observation” column.

5) Using the “Stirring Spoon,” remove the nails from the salt-vinegar solution, rinse them and place them on a paper towel to dry.

6) Examine the nails and screws again, and record your observations under the “After Observations.” Touch the nails and record what they feel like. Note any differences in the nails from before they were put into the solution and after they came out of the solution. Compare the bottom half of the nail that was in the solution to the top half of the nail that was not in the solution.

7) Clean up your investigation area carefully. Be sure all materials are rinsed off, put back into your tub in an organized manner and the table is clean. Please acquire three more nails for the next class and return your used nails to your teacher.

**Investigation #4: Antacid Tablet**

Procedure:

1) Insert the antacid table into the balloon. You may have to break the tablet so the pieces fit through the opening in the balloon.

2) Measure 30 mL of water using the graduated cylinder.

3) Using the funnel, pour the water into the small flask.

4) Record observations of the antacid tablet in the balloon and the water under the “Before Observations” column. (What does it feel like? look like?, etc…) Draw a sketch of the antacid in the balloon and the water in the flask.

5) Once all groups have completed their observations, continue.

6) Have one group member hold the balloon upright, empty the tablet from the balloon into the flask. Hold the balloon onto the flask tightly so it does not fall off.

7) Observe the balloon and the flask for the next 5 minutes. During this time, touch the outside of the flask from time to time to make observations of any temperature changes. Record your observations in the “During Observations” column. Make sure to record the differences you see in the flask and the balloon, as well as any temperature changes you might feel.

8) After the 5 minutes, record what you think happened to the antacid tablet and the water under the “After Observations” column. Explain your reasoning.

9) Clean up your investigation area carefully. \*\*Remove the balloon from the flask by peeling the balloon slowly away from you or any other group member.\*\* Be sure all materials are rinsed off, put back into your tub in an organized manner and the table is clean.