Science 9

Investigating Chemical Changes in Matter

Name:
Date:
Block:

Objectives:

1. To observe chemical changes in matter
2. To recognize the signs of a chemical change

Hypothesis:

If I observe _____

_____,

then a chemical change has occurred **because** _____

_____

Lab Safety

- Avoid contact with chemical solutions with eyes and all body tissues
- Be sure to wear safety goggles and a lab apron at ALL times when in the lab
- Be sure to tie up long hair and roll up long sleeves
- Closed-toed shoes and long pants need to be worn during the lab
- After the lab is complete, be sure to wash hands thoroughly with soap and water

Station 1: Alka Seltzer with HCl

1. Take a half Alka Seltzer tablet and put it in a small beaker
2. Measure 10 mL of 3.0M HCl using a graduated cylinder and pipette
3. Pour the HCl into the small beaker with the Alka Seltzer tablet
4. Watch for 2 minutes and record observations in data table
5. Wash the solution down the sink and flush with plenty of water

Station 2: Magnesium with HCl

1. Using the tweezers, take a piece of magnesium and put it in a small beaker
2. Measure 10 mL of 3.0M HCl using a graduated cylinder and pipette
3. Pour the HCl into the small beaker with the magnesium strip
4. Watch for 2 minutes and record observations in data table
5. Wash the solution down the sink and flush with plenty of water

Station 3: Milk of Magnesia with Phenolphthalein

1. Using a graduated cylinder, measure 10 mL of Milk of Magnesia and pour it into a small beaker
2. Add 5 drops of phenolphthalein
3. Record observations in data table
4. Wash the solution down the sink and flush with plenty of water

Station 4: $CaCl_2$ + Na_2CO_3 + bromothymol blue

1. Using a graduated cylinder, measure 10 mL of water and pour it into a small beaker
2. Using the weigh boat and scale, scoop 0.50 g of $CaCl_2$ and place it into the small beaker with water. Stir the solution with a stir rod. Add 2 drops of bromothymol blue.
3. Using a graduated cylinder, measure 10 mL of water and pour it into a second small beaker
4. Using a weigh boat and scale, scoop 0.50 g of Na_2CO_3 and place it into the second small beaker with water. Stir the solution with a stir rod. Add 2 drops of bromothymol blue.
5. Pour the two solutions together
6. Record observations in data table
7. Wash the solution down the sink and flush with plenty of water

Data & Observations*:*

Mixture	Qualitative Observations
Station 1: Alka Seltzer + 10mL 3.0M HCl	
Station 2: Magnesium + 10mL 3.0M HCl	
Station 3: 10mL Milk of Magnesia + 5 drops phenolphthalein	
Station 4: $CaCl_2$ solution + 2 drops bromothymol blue + Na_2CO_3 solution + 2 drops bromothymol blue	

	Emerging	Developing	Proficient	Extending
Questioning and Predicting	Hypothesis does not relate to the question and explanation is not relevant Not all data recorded is relevant; a few key pieces missing.	Hypothesis somewhat relates to the question and a brief explanation is provided Most data recorded is relevant, but some is still missing.	Hypothesis is relevant to the question, though, explanation needs to be expanded on All data recorded is relevant. An attempt at scientific vocabulary is used	Hypothesis is relevant to the question and provides a reasonable scientific explanation All data recorded is relevant and descriptive. Scientific vocabulary is properly used in the correct context

	Emerging	Developing	Proficient	Extending
Planning and Conducting	The lab may be started on time but is not completed before the designated end time. Significant teacher assistance is required. Equipment is rarely handled correctly/safely. Lab is completed with a few safety mistakes. A few reminders are needed to keep safety glasses on. Reminders are needed to return equipment. The lab is conducted by certain individuals, while other members are off task. Students are often off task and need many redirections back to the lab.	The lab is started on time but is not completed before the designated end time. Some teacher assistance is required. Equipment is occasionally handled correctly and safely. A few reminders are needed to keep safety glasses on. Some equipment is properly cleaned/returned. The lab bench is wiped down. The lab is conducted by certain individuals, while the other members of the group observe. Everyone is treated with respect. Students are sometimes off task and need to be redirected back to the lab.	The lab is started on time and completed by the designated end time. The lab is completed with minor teacher assistance. Equipment is mostly handled correctly and safely. Safety goggles are almost always worn. Almost all equipment is properly cleaned/returned. The lab bench is wiped down and clean. The lab is conducted between group members, but someone is taking the lead. Everyone is treated equally and with respect. Students are on task and focused throughout the lab.	The lab is started on time and completed efficiently. The lab is completed independently, without teacher assistance. All equipment is handled correctly/safely. Safety goggles are worn at all times. All equipment is cleaned and returned. The lab bench is wiped down and clean. The lab equipment is reset for the next group. The lab is conducted collaboratively between your group members. Everyone is treated equally and with respect. Students are on task and focused throughout the lab.

Analysis/Conclusion:

1. What observations lead you to believe that a chemical reaction occurred? Be specific and provide evidence to each station

    a. Station 1:

    b. Station 2:

    c. Station 3:

    d. Station 4:

2. Describe and discuss **two** examples of chemical changes you experience in everyday life. Be sure to provide evidence and discuss why your example is a chemical change.

    a.

    b.

3. In your own words, discuss how chemical changes are different from physical changes. Use examples to supplement your response.

Write a short paragraph conclusion (about 5 – 6 sentences) about this lab. Be sure to answer these questions in your paragraph:

a. What did you discover?
b. Was your hypothesis supported or not supported?
c. What factors may have affected your results?
d. If you were to redo the experiment, what changes would you make?
e. What can you conclude in this experiment?