

## Inquiry Question

Can I recognize chemical change by doing some kitchen chemistry?

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



There are two types of changes: physical change and chemical change. It's important to be able to tell the difference between these two types of changes. If you change something physically you still have what you started with and usually this is reversible (you can easily get back the substances into their original form). However, if you change something chemically then this results in something very different than what you started with. The original substance or reactant changes into a new substance, called a product, with different properties. Most chemical changes are non-reversible.

How can we tell if something is a chemical change? What evidence can we look for?

Does it look different after the change? Was heat or gas given off during the change? Did solid particles form? Would it be difficult to change back to the reactants? One of these changes alone is often not enough to determine if a chemical change occurred. We may need to consider several clues. It is time for some kitchen chemistry to investigate chemical change.

In this project you will be conducting an investigation. The assignment is in the form of a **lab report**, where you document your investigation and findings.

### General Instructions

The goal of this project is to identify chemical change and to gain experience writing up lab reports.

#### Materials you'll need:

- small glass jars
- eye dropper
- heat source such as an electric stove burner
- vinegar
- baking soda
- milk
- small piece of eggshell
- 2 pieces of uncooked spaghetti
- lemon juice
- paper
- yeast
- sugar
- water
- paper
- the following “Chemical or Physical Change?” lab and report template

#### Ideas and Hints:

- You will be using the lab report format for this investigation. The template is included in the following pages.
  - Your hypothesis is based on the material you learned in the previous section. For example, “if certain things were seen then it could be recognized as a chemical change .....
  - Your conclusion will, therefore, discuss your successes, as well as others that you could or couldn't identify.
- Below is a video reminder of how to write up a lab report.  
<https://www.youtube.com/watch?v=LHPGZ03W8W4>
- Complete the following “Chemical or Physical Change?” lab using the template provided.

#### Project Submission:

Upload your completed lab report to the project submission folder at the end of the unit.

**CHEMICAL OR PHYSICAL CHANGE?****Question**

Can you tell the difference between a chemical and a physical change?

**Hypothesis**

What is your best guess about what you think will happen? Write it as an “If... then...” statement. If “something is done” then “what is the expected result.”

**Materials**

small glass jars  
eye dropper  
heat source such as electric stove burner  
vinegar  
baking soda  
milk  
small piece of eggshell  
2 pieces of uncooked spaghetti  
lemon juice  
paper  
yeast  
sugar  
water  
paper

**Procedure**

1. Observe and record the properties of each substance before proceeding.
2. Using the eye dropper
  - add vinegar to a small sample of baking soda.
  - add water to a small sample of baking soda
  - add vinegar to a small sample of milk
  - add water to a small sample of milk
  - add vinegar to a small piece of egg shell
  - add water to a small piece of egg shell
3. Observe and record any changes in the mixtures above.
4. Dip a piece of uncooked spaghetti in water. Use the spaghetti like a pencil and write your name on a piece of paper.  
  
Dip the other piece of uncooked spaghetti in lemon juice and write your name on another sheet of paper.

5. Very carefully, using oven mitts, heat each piece of paper over the electric stove burner. Observe and record the results. Be very careful and have a dry pan right beside to put it into afterwards.

6. Mix yeast and a small amount of warm water in two containers. Stir sugar into one of the containers. Observe and record the results.

### Data and Observations

Include a chart similar to the following (include all 6 different combinations):

Substances	Observations
vinegar and baking soda	
water and baking soda	
vinegar and milk	

Also include observations about the spaghetti and yeast portions of the experiment.

### Analysis

Which combinations produced physical changes and which produced chemical changes? What clues did you use to decide whether the change was physical or chemical?

### Conclusion

Remember to refer back to the question and hypothesis to explain the results of your experiment.

### Applications

Based on your observations, why is baking soda used in recipes for cakes and cookies? Give one example of a physical change and one example of a chemical change that you have noticed during meal preparation.

## Science

### LAB REPORT

### Instructions:

Print out this sheet or complete the information on your computer for your investigation/experiment. If there is not enough room, write your responses on a separate paper. When you submit this report be sure to include your separate Data/Observations and Analysis. See your lesson notes and the video link to get further details about each part.

Title: \_\_\_\_\_

Name: \_\_\_\_\_

### Question:

Re-write the question posed in the lab instructions in your own words. (1-3 Sentences)

### Hypothesis:

This will be what you guess to be the answer to the **Question**. It is your prediction based on the above question. 1-2 sentences. It should be written as an “If.....then.....” statement.

### Materials:

What material is needed to do this investigation?

## Procedure:

What steps does a person do in this investigation? Try to be as specific as possible. You may choose to include a diagram as well as the steps of the procedure.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_

## Data and Observations:

What did you see, hear, or smell? These are your notes about your observations. This can be in the form of sentences, lists, tables, or diagrams. If you require more space for your data and observations add a **separate piece of paper** that you'll include with this report. Make sure to write "Data and Observations" clearly at the top. Any required tables should be included here.

## Analysis:

What do your **Data and Observations** tell you about your original **Question**? This is where you try to interpret your data and explain what they mean. There may be specific questions for some experiments that will be included with the assignment. If you require more space for your analysis then add a **separate piece of paper** that you'll include with this report. Make sure to write "Analysis" clearly at the top and then write both the questions and the answers.

## Conclusion:

What did you find out? Was your **Hypothesis** correct or disproven? 1-3 sentences.

## Applications:

What did you learn from this experiment that you could use in real-life? How could you apply this information? Answer any questions that were in the assignment. 1-3 sentences.