Activity: Chemistry in the Kitchen!

FOR THE TEACHER

Summary
In this activity, students will describe the steps required to complete a recipe of their choosing. They will identify any physical and chemical changes that occur throughout the process.

Grade Level
Elementary School

NGSS Alignment
This activity will help prepare your students to meet the performance expectations in the following standards:

- **5-PS1-4**: Conduct an investigation to determine whether the mixing of two or more substances results in new substances.
- **5-PS1-3**: Make observation and measurements to identify materials based on their properties.
- **Scientific and Engineering Practices**:
  - Analyzing and Interpreting Data
  - Engaging in Argument from Evidence

Objectives
By the end of this activity, students should be able to

- Identify and explain physical and chemical changes from a recipe.
- Differentiate between a physical change and a chemical change.
- Explain the difference between mixtures and solutions.

Chemistry Topics
This activity supports students’ understanding of

- Physical Change
- Chemical Change
- Matter
- Solutions
- Mixtures

Time
**Teacher Preparation**: 15 minutes
**Lesson**: 90-120 minutes

Materials
- Kid-friendly cookbooks or websites
- Student handouts
- Crayons or colored pencils

Safety
- No specific safety precautions need to be observed for this activity.

Teacher Notes
- This is meant to be used as a culminating activity and assumes that your students already have a working understanding of physical and chemical changes.
- Differentiation:
  - Students are asked to either write a recipe or use an existing recipe. Use your discretion...
depending on your students’ abilities.

- It may be useful to provide students with sample recipes that they can use if they choose.
- Students can work independently but could also work in partners.
- Note that this activity does not require the students to actually make the recipe.

**Activity outline:**

- **Introduction:** Show students a very simple recipe as an example, just as this one for preparing Fruit Kabobs. Ask them to identify any physical and chemical changes in the recipe. You could display the recipe on a smart board and ask students to record their answer or you can give them small copies and ask them to highlight chemical changes in one color and physical changes in another.

- **Modeling:** Share the instructions and also the rubric with students. Using a simple recipe with at least 5 steps, demonstrate how the students should describe a step, illustrate it and identify the type of change that occurs. You might also identify the mixtures and/solutions present in the recipe since students are required to do this in their analysis question.

- I suggest that students complete this assignment individually.

- Once students have completed their own recipe assignment, ask students to complete peer-review evaluations (template provided). Each student should review 2-3 other projects, using the Peer Evaluation Rubric.

- A sample rubric for teacher-grading has also been included.

- Extension: Students could prepare their recipe to bring in to class for extra credit.

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**FOR THE STUDENT**

**Lesson**

**Chemistry in the Kitchen!**

**Background**
In order to complete this project, you need to be able to answer the Pre-lab questions below. Please watch this video if you need to review the concepts.

**Pre-lab Questions**

1. How is a physical change different from a chemical change?
2. Provide an example of a physical change as well as a chemical change.
3. Is lemonade a mixture or solution? How do you know?

**Objective**
You will compose a step-by-step informational recipe in order to identify and explain physical and chemical changes in real life.

**Procedure**

1. Choose a recipe that you have either made yourself or from a kid friendly cookbook or website that your teacher provides (your recipe choice should have at least 5 steps). Record the name of the recipe in the data table below.
2. On the left side of the table, describe the instructions for the recipe step that should be followed. Also include an illustration of the step (you may also use pictures you print from online or find in magazines).
3. On the right side of the table, indicate if a physical or chemical change is taking place during the step. Describe the type of change that is taking place, in detail, on the lines to the right of each step in the space provided below. Your teacher will
provide you with an example.
4. Complete the analysis and conclusion questions.

<table>
<thead>
<tr>
<th>My recipe title:</th>
</tr>
</thead>
</table>
| Step 1: Describe and illustrate below | _____ Chemical Change  
_____ Physical Change  
_____ No Change |
| Describe the change that occurred: |
| Step 2: Describe and illustrate below | _____ Chemical Change  
_____ Physical Change  
_____ No Change |
| Describe the change that occurred: |
| Step 3: Describe and illustrate below | _____ Chemical Change  
_____ Physical Change  
_____ No Change |
| Describe the change that occurred: |
| Step 4: Describe and illustrate below | _____ Chemical Change  
_____ Physical Change  
_____ No Change |
| Describe the change that occurred: |
Step 5: Describe and illustrate below

<table>
<thead>
<tr>
<th>Chemical Change</th>
<th>Physical Change</th>
<th>No Change</th>
</tr>
</thead>
</table>

Describe the change that occurred:

Step 6: Describe and illustrate below

<table>
<thead>
<tr>
<th>Chemical Change</th>
<th>Physical Change</th>
<th>No Change</th>
</tr>
</thead>
</table>

Describe the change that occurred:

**Analysis**

1. Is the final product of your recipe created by a physical or chemical change? How do you know?

2. Describe any mixtures and solutions that were created in your recipe.

3. What change could you make to your recipe that would result in a different type of change? (For example: If your recipe results in a physical change, what would cause a chemical change to occur?)