Fun with Chemical changes
5th Grade
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References:

Benchmarks:
SLC 8: Propose and/or evaluate an investigation of simple physical and/or chemical changes.

CPS Benchmark: A) Students will identify physical and chemical changes and compare their properties.

Objectives:
This lesson is to help students practice articulating markers of chemical and physical changes.

Materials:
For each student group:
• Cabbage Juice
• Plastic pipettes or medicine droppers
• Laminated worksheets
• Baking soda
• Lemon juice
• Vinegar
• Salt
• Sugar
• Cornstarch
• Milk
• Dish soap mixed with water
• Window cleaner (Diluted)
• Water
• Film canisters
• paper towels (for clean up)
• Small glasses or beakers

For each student:
• Photocopied worksheets
**Preparation:** Make enough Lab sheets for each group and laminate them. The test can be done directly on top of the lamination and then easily wiped clean at the end of the lab.

Put a small amount of each of the test items into film canisters for each group. Take several leaves of a red cabbage and grind with water in a blender. Pour the mixture through a strainer and collect the juice. The leaves can be discarded. This has a potent smell so make sure to keep the juice refrigerated in a sealed container until you are ready to use it. Do not prepare it more than a day or two before you plan to do this activity. Cover the container or use an opaque container so the color of the liquid is not obvious.

**Initial Demonstration:**

Set out three beakers with 3 clear liquids: water, window cleaner, and vinegar. Ask the students to predict what color the liquid in your opaque container is (the red cabbage juice). Pour some into one of the cups. Ask them to make a guess now. This time it will be an educated guess and they can give you a reason behind the guess. Repeat this for each glass. (The liquids should be reddish-pink, purple, and green). Reveal the juice to the students.

Ask the students which of the glasses had a chemical change, and to support their statement with evidence. The color change on two of the glasses is a physical change that indicates a chemical change.

**Target Observations:**

- Cabbage juice changes different colors when it is mixed with different liquids.

**Target Model:**

- When cabbage juice is mixed with some liquids, there is a chemical change, as evidenced by the color change.

**Procedure:**

Give each set of students a laminated lab sheet, a set of test materials, some droppers or pipettes, and a container of cabbage juice. Each student should receive a work sheet to record their results. Instruct the students to place a couple of drops of each liquid on the lab sheet and then add a couple of drops of cabbage juice. They should record their observations on their worksheet. They should also add a little solid to the lab sheet and then a couple of drops of red cabbage juice.

Discuss with the students which materials show a chemical change and which materials do not. (The water and salt will probably not react). Ask what all the materials
that turned red/pink had in common. (They are all acids, though students may not know this).

**Target Revised Model:**

- When cabbage juice is mixed with some liquids, there is a chemical change, as evidenced by the color change. Similar materials react in similar ways.

**Procedure:**

Have the students wipe off the lab sheets with a damp paper towel. Collect the materials. See if the students can guess which materials were used in the initial demonstration based on their data collected.

**Target Revised Model:**

- The initial materials used were water, window cleaner and vinegar as shown by the matching color change when using those materials in the student experiment.

**Summary:**

We can use our observations of chemical changes to make inferences about the identity of things we observe.
Lab Sheet

Put a few drops of your test liquid in the circle. Then add a few drops of cabbage juice. Record your observations on your worksheet.

- lemon juice
- dish soap
- window cleaner
- water
- vinegar
- other

Put a pinch of each solid in the circle. Then add a few drops of cabbage juice. Record your results on your worksheet.

- salt
- baking soda
- cornstarch
- sugar
- other
Juicy Changes!
Name _________________________ Room _____ Date ________________

Fill in the chart below with your observations about the reactions you observe. Identify each change as a physical change or a chemical change. In the last column, give your evidence for what kind of change. (For example, a chemical change may have a color change or a new substance).

<table>
<thead>
<tr>
<th>Substance</th>
<th>Observations</th>
<th>Physical or chemical change?</th>
<th>Evidence</th>
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</thead>
<tbody>
<tr>
<td>lemon juice</td>
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<td>dish soap</td>
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<td>window cleaner</td>
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<td>water</td>
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