

Lesson Title: Balloon Lab

Lesson Overview: Students will learn about the properties of a physical and chemical change. They will have the opportunity to observe a chemical change and investigate whether mixing substances together will result in new substances.

Topic(s): Physical Science

Grade or Grade Band: 5th Grade

Lesson Objectives:

- Observe and explain details in a chemical reaction
- Complete an experiment to show a chemical change
- Identify the properties of a chemical change.

Next Generation Science Standards:

5-PS1-4 Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

North Dakota Standards:

5-PS1-4 Conduct an investigation to determine whether the mixing of two or more substances results in a new substance

PS1.b When two or more different substances are mixed, a new substance with different properties may be formed.

Time Needed (estimate): 35 minutes

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Preparation/Materials

Background knowledge students must have to be successful: Students should have a solid understanding of cause-and-effect relationships for explaining change. At 5th grade students should know the three states of matter: solid, liquid and gas.

Differentiation and accommodation to support learning for all students:

Create an anchor chart with pictures and lists of both physical changes and chemical changes.

Allow students to draw pictures or record a spoken reaction to the investigation.

Essential terminology:

- Matter-any substance that takes up space
- Property- a characteristic or trait that can be used to describe matter by observing and/or measuring
- Chemical change-when one substance is transformed into one or more different substance
- Physical change-a change in the size or shape of a substance, where the matter is not transformed into another substance

Resources:

Balloon Lab Video: <https://youtu.be/v5evWbZ39YM>

Physical or Chemical Change Quiz: <https://www.quia.com/quiz/303980.html>

Materials needed:

- Spoons
- Bowls
- Alka-Seltzer tabs
- Balloons
- Water bottle half full of water

Procedure/Activities

Engage: Display the definition of a chemical change and a physical change on the board. Hold up a piece of paper and rip it in half. Ask students whether ripping the paper is a chemical or physical change. Allow students to explain their answers. Students should come to the conclusion that it is a physical change because it is still paper, it just changed size. Ask students to think about what can be done to the paper to create a chemical change. (burning, bleaching, digesting)

Explore: Watch the first half of the Balloon Lab video: <https://youtu.be/v5evWbZ39YM> to help students understand how to prepare their balloon lab. After students have gathered their materials, use the Balloon Lab Observation sheet to record observations about the lab materials prior to the investigation. Students should describe as many details as possible about each material listed. Complete the balloon lab by pouring the Alka-Seltzer tabs into the water as described in the video and observe what happens. Encourage students to record any physical or chemical changes they noticed.

Explain: Watch the remainder of the balloon lab video: <https://youtu.be/v5evWbZ39YM> which will explain to students what happens when the Alka-Seltzer reacts to the water. Allow students time to discuss the observations they made while completing the investigation.

Extensions for learning more about this topic:

Science: 5-PS1-2 Measure and graph metric quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total mass of matter is conserved. Prior to the investigation, students can measure the weight of all the substances and then again after the investigation to gather evidence that the total mass of matter was conserved.

Social Studies: Research the connection between science and social studies through the study of the oil boom in North Dakota and the chemical and physical changes that have occurred due to oil production.

Evaluation of learning (formative or summative task)

- Ask students to write an argument using data collected from their investigation explaining whether mixing two substances created a new substance.
- Review the Balloon Lab Observation sheet with the students
- Use the Physical or Chemical change quiz: <https://www.quia.com/quiz/303980.html>

Balloon Lab Observation

Material	State of matter	Description	Changes Observed
Balloon			
Water (in bottle)			
Plastic bottle			
Alka-Seltzer Tablet			