Lesson: The Chemistry of Eggs

FOR THE TEACHER

Summary
In this lesson students will learn that vinegar can react with the Calcium in an egg shell to make it rubbery. First, the students will listen to the teacher read a book about eggs. The teacher will then put an egg in a jar with vinegar and let it set for two days. Students will make a prediction about what they think will happen to the egg, and then together they will investigate the final results.

Grade Level
Elementary School

Objectives
By the end of this lesson, students should be able to
- Describe the meaning of chemical change.
- Understand that combining two substances can result in a chemical reaction/change.
- Record observations.
- Make a hypothesis based on their knowledge of a situation.

Chemistry Topics
This lesson supports students’ understanding of
- Chemical Reactions
- Chemical change
- Observations
- Acids & Bases

Time
Teacher Preparation: 10 minutes
Lesson: 45 minutes for lesson, 2 days for full results

Materials
- Raw/uncooked egg
- Vinegar (enough to cover the egg)
- Glass jar or bowl (large enough to hold vinegar and egg)
- Book: Chickens Aren’t The Only Ones, by Ruth Heller

Safety
- Always wear safety goggles when handling chemicals in the lab.
- Students should wash their hands thoroughly before leaving the lab.
- When students complete the lab, instruct them how to clean up their materials and dispose of any chemicals.
- When working with acids, if any solution gets on students’ skin, they should immediately alert you and thoroughly flush their skin with water.

Teacher Notes
- This lesson is appropriate for Kindergarten-Fifth grade
- I suggest doing the following during this lesson:
- Read the book, Chickens Aren’t the Only Ones, by Ruth Heller.
- Show the students an egg and discuss its shape and strength.
- Demonstrate that when you put an egg in the palm of your hand and squeeze you can’t break the egg.
- Explain how the egg is strong because it has calcium in the shell.
- Put the egg in a glass jar or bowl and add enough vinegar to the bowl to cover the egg.

- Depending on the level of the students discuss the composition of vinegar, explain that it is an acid. Suggest other examples of acids to connect with student’s prior knowledge, such as soda, lemons or acid rain.
- Students will predict (introduce hypothesis here) what they think will happen to the egg shell when it sits in the acidic vinegar solution for 2 days. You may want students to write their predictions in a science journal, or use a student handout such as the one provided.
- The provided student handout can be completed as a class activity for younger students.
- The students can draw a before sketch and write initial observations for the egg, and then do the same after 2 days have passed.
- Background/results: Vinegar is an acid called acetic acid and eggshells are made up of calcium carbonate. A chemical reaction will occur between the two, and bubbles will form. These bubbles are carbon dioxide gas produced during the reaction. The egg shell will react with the vinegar, and after a couple days the shell will be gone. The egg will remain intact, and will be slightly swollen, but will have no shell, and it will be very delicate, so be careful while handling it!
- Differentiation: You may want to have the students work in groups and each group could have their own egg to observe.
- Optional: Students could experiment with different objects/items in the vinegar solution and compare results. Or, students could use eggs but change solutions and experiment using a soft drink or water.
FOR THE STUDENT

Lesson

The Chemistry of Eggs

Pre-lab Questions
1. What is an acid? What are some examples?
2. What is a chemical change? Give an example.

Hypothesis
When the egg is combined with vinegar for 2 days, I think the egg will:
A. Change Color
B. Become Hard on the inside
C. Become Rubbery
D. Not change at all

Data
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<thead>
<tr>
<th>Draw a sketch of the egg on the 1st day:</th>
<th>Write your observations of the egg on the 1st day:</th>
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<table>
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<tr>
<th>Draw a sketch of the egg after 2 days:</th>
<th>Write your observations of the egg after 2 days:</th>
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