

Chemist: Natural vs Synthetic Materials

Adventure Description:

In this adventure, students will think like a chemist and learn about natural and synthetic materials.



Activity

Step One: Background Information on Chemists (10 minutes)

- Ask students what they know about chemistry.
- Explain to students that chemists study chemistry. Chemistry is the study of the properties of matter.
- Matter is anything that has mass and takes up space.
- The properties of matter include color, size, density, reactivity, etc.
- Explain to students that some chemists study natural materials (meaning materials that occur in nature) and then try to replicate them in a lab.
- When scientists create copy of naturally occurring material, the copy is called a synthetic material.
- Show [Handout: Natural vs. Synthetic Materials](#) and discuss what each material is made of.
- Ask students if they know anything about the problem with plastic water bottles. Expect students to know that plastic water bottles pollute the land and oceans because they take a very long time to break down.
- Next, explain to students that chemists are looking for new materials that can be used to make synthetic plastics.
- Scientists are looking to create a plastic out of natural materials that could be used to make "plastic" water bottles that would break down much faster than traditional plastic (made of oil).
- Explain that chemists have figured out how to turn milk (a natural material) into plastic (a synthetic material) that also biodegrades.
- Ask students why chemists would want to use milk (rather than oil or coal) to make plastic.
 - Explain that milk is a renewable resource. As long as we keep the cows healthy, we can always get more. When we use a nonrenewable resource, like coal, we can't get more if we run out.

Step Two: Making Plastic Out of Milk

- Explain to students that they will now make their own plastic out of milk.
- Provide students with [Handout: Steps to Make Plastic](#). As a class, read through the steps.
- Divide students into groups and provide them with the following materials:
 - 1 cup of whole milk

Please contact Allison Bischoff, Director of Teacher Support, at allison@rozzylearningcompany.com or 314-272-2560 with questions.

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- 4 tablespoons of vinegar
- 2 bowls or large cups
- Measuring Spoons
- Mesh Strainer
- Paper towels
- Have students complete the steps on their handout.
- As students are working, ask them the following questions:
 - What steps would you change to make it easier to turn milk into plastic?
 - Think of items you use that are made of plastic. Do you think that milk could be used to create any of these items?

Step Three: Discussion (5 minutes)

- Have a class discussion about how plastic can be made from different materials (oil or milk). Discuss how chemists decide what materials to use based on a variety of factors (cost environment, consumer demand, etc.)

Materials List

Provided online:

- Handout: Natural vs. Synthetic Materials
- Handout: Steps to Make Plastic

Not provided (each student or group needs):

- 1 cup of whole milk
- 4 tablespoons of vinegar
- 2 bowls or large cups
- Measuring Spoons
- Mesh Strainer
- Paper towels
- Microwave

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