

Chemistry All Around Us - Week 5

Day 4: Bartholomew and the Oobleck

Teacher/Parent Background:

Bartholomew and the Oobleck is a 1949 book by Dr. Seuss (Theodor Geisel). It follows the adventures of a young boy named Bartholomew Cubbins, who must rescue his kingdom from a sticky green substance called "oobleck." Oobleck, in this lesson, is a mixture of cornstarch and water that exhibits properties of both liquids and solids.

Overview:

In this activity, young learners will use their experiences exploring various observable properties (characteristics) of different types of matter to determine how oobleck should be sorted, solid, liquid or gas, based on its properties.

Related Standards:

- **Analyze and interpret data** to explain that matter of any type can be subdivided into particles too small to see and, in a closed system, if properties change or chemical reactions occur, the amount of matter stays the same.

Key Terms:

- matter - the "stuff" that everything is made of
- properties - characteristics of a substance
- senses - touch, taste, hear, smell, see
- solid - a state of matter in which the substance has a definite shape and a definite volume
- volume - the amount of space that an object or substance takes up
- liquid - a state of matter in which the substance has a definite volume but not a definite shape. It takes the shape of its container.
- gas - a state of matter in which the substance takes the shape and volume of its container

Materials List:

- digital or print copy of Bartholomew and the Oobleck by Dr. Seuss
 - <https://www.youtube.com/watch?v=8RqzaouDFLM>
- water
- cornstarch

- food coloring (optional)
- bowl

Activity Description:

1. Revisit the types of matter the student has been sorting during this week's lessons.
 - This week, you have been sorting different types of matter into groups or categories. How did you decide which types of matter to group together?
 - We discussed that matter is classified/sorted/grouped in three categories: solids, liquids and gases. How are solids, liquids and gases alike? How are they different?
2. Introduce the story of Bartholomew and the Oobleck.
 - Bartholomew and the Oobleck is a story about a boy, Bartholomew, who must rescue his kingdom from a sticky, green substance called "oobleck."
 - As we read/listen to the story, we are going to gather clues about this substance called oobleck. We will then use the clues to help us decide if oobleck is a solid, liquid or gas.
3. Read/listen to Bartholomew and the Oobleck. Discuss how the substance oobleck is described throughout the story.

Closure:

Prompt the student to decide if oobleck is a solid, liquid or gas based on evidence gathered while reading/listening to the story. Encourage him/her to draw a diagram of the particles that make up oobleck. Are the particles close together like a solid, or more free flowing like a liquid or gas? Why?

- Note: Evidence that oobleck has properties of both a liquid and a solid can be found throughout the story. Matter with properties of both liquids and solids is called a non-Newtonian fluid. It is not important that the student be introduced to this term at this age. It is important that the student understand that not all types of matter fit easily into the three main categories.

Extension:

Make Your Own Oobleck

- water
- cornstarch
- food coloring (optional)
- bowl

Start with the water in a bowl and add the cornstarch a bit at a time (Ratio of water to cornstarch is 1:2)

Keep stirring until it has a goeey consistency. You may want to use your hands.

When the oobleck is just right, slowly add food coloring, if you want. This can be a challenge to get it mixed properly.

Play with it:

- Grab a handful and squeeze it. Let it ooze through your fingers.
- Make a puddle and quickly drag your fingers through it.
- Put it into a plastic container and shake it or quickly bump it against a table.
- Jab at the oobleck and then slowly let your finger sink in.
- Roll some oobleck into a ball. It becomes solid, but when you stop moving it, it will melt back into your hand.

Reminders:

- Don't drop oobleck on furniture, patios, or sidewalks. It's hard to get off.
- Oobleck isn't poisonous, but it tastes awful. Wash your hands after playing. Make sure children are supervised.
- Wear old clothes, as oobleck tends to get messy.
- Lay a couple newspapers on the floor/table so it doesn't get all over.
- Oobleck may solidify if it's not kept wet. If it hardens, just throw it away.
- If oobleck is left out too long, it will dry out and turn back to cornstarch.