



Overview:

Students actively participate in two hands-on activities that demonstrate the three states of matter (solid, liquid, and gas). (NOTE: Level I students are not expected to understand gases.)

Objectives:

The student will:

- work in groups to complete an assigned task;
- use four of the five senses to investigate; and
- classify the properties of solids and liquids.

GLEs Addressed:

Science

- [3-4] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating.
- [3] SA1.2 The student demonstrates an understanding of the processes of science by observing and describing the student's own world.
- [4] SA1.2 The student demonstrates an understanding of the processes of science by observing, measuring, and collecting data from explorations and using this information to classify, predict, and communicate.
- [3] SB1.1 The student demonstrates an understanding of the structure and properties of matter by classifying matter according to physical properties (i.e., color, size, shape, weight, texture, flexibility).
- [4] SB1.1 The student demonstrates an understanding of the structure and properties of matter by identifying and comparing the characteristics of gases, liquids, and solids.

Materials:

- Cornstarch
- Water
- Green food coloring
- Dr. Seuss. (1949). *Bartholomew and the Oobleck*.
- STUDENT WORKSHEET: "Oobleck"

Vocabulary:

matter - the substance of which a physical object is composed

solid - a substance that keeps its size and shape

liquid - flowing like water; fluid matter having no fixed shape but a fixed volume

gas - a fluid (as hydrogen or air) that has no fixed shape and tends to expand without limit

Activity Preparation:

Make enough oobleck for each small group of students to explore. For each batch, mix together 1 ½ cups of corn starch, 1 cup of water, and as much green food coloring as desired.

Activity Procedure:

1. Ask students to think about what they had for breakfast that morning. Explain that items like juice and milk are liquids; items like toast and fruit are solids. Ask students what makes an item solid and what makes an item liquid. List student ideas on the board.
2. Explain that solid items are rigid or hard; they don't change their shape very easily. Liquids are fluid; they change their shape to fit the container.
3. Ask Level II students what they are breathing (*air*). Explain that air is a gas. Explain that a gas is like a liquid, but it changes its shape easily and can also change its volume, getting larger or smaller as it gets warmer or cooler.
4. Ask students to stand in a circle. Explain that they will represent a solid. Ask students to link arms. Invite them to try and move without unlinking their arms.
5. Ask students to pretend that the solid is melting. Explain that they should unlink their arms and move a little, but stay in contact with their neighbor.
6. As a class, discuss the difference between the two circles. How is a solid different than a liquid? Make sure students understand that liquids are fluid and change shape easily, and solids are rigid and do not change shape easily.
7. Ask Level II students to stand in a circle and act as a gas. Explain that they should move around constantly, drifting away from each other until they fill the room.
8. Divide students into small groups (combining younger and older students works well). Distribute the STUDENT WORKSHEET: "Oobleck" and instruct students to answer the first three questions. Next, guide students through the investigation and assist them in determining whether the oobleck is a solid or liquid.
9. As a class, discuss student results. Ask students how they classified their oobleck. Explain that the oobleck is both a solid and a liquid. Read *Bartholomew and the Oobleck* by Dr. Seuss. Ask students how their oobleck was different from the oobleck in the book.
10. If time allows, ask students to play/experiment with the oobleck further. Instruct them to devise their own experiments. Ask students to share what they tried and their results.

Answers:

1. B
2. A
3. C
4. Liquid
5. Liquid
6. Solid
7. Solid
8. Liquid
9. Solid
10. Solid
11. Solid
12. Answers may vary.

Name: _____

Levels

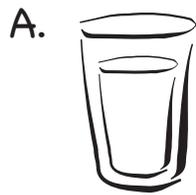
Oobleck

Student Worksheet (Page 1 of 2)

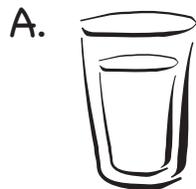


Answer the following questions before completing the investigation on the following page.

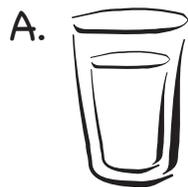
1. Which one is a solid?



2. Which one is a liquid?



3. Which one is a gas?



Name: _____

Oobleck

Student Worksheet (Page 1 of 2)

Perform each of the following tests and determine whether the oobleck is acting like a solid or liquid. Circle your choice.

- | | | |
|---|-------|--------|
| 4. Pick up the oobleck. | SOLID | LIQUID |
| 5. Pour the oobleck into another bowl. | SOLID | LIQUID |
| 6. Flatten the oobleck like a pancake. | SOLID | LIQUID |
| 7. Hit the oobleck with your hand. | SOLID | LIQUID |
| 8. Slowly poke the oobleck with your finger. | SOLID | LIQUID |
| 9. Quickly poke the oobleck with your finger. | SOLID | LIQUID |
| 10. Roll the oobleck into a ball. | SOLID | LIQUID |
| 11. Bounce the oobleck on the desk or table. | SOLID | LIQUID |

Now that you have made some observations about the oobleck, answer the following question.

- | | | |
|---------------------------------------|-------|--------|
| 12. Is the oobleck a solid or liquid? | SOLID | LIQUID |
|---------------------------------------|-------|--------|

Clean up your area so the next group can play with the oobleck.