Is Oobleck a Solid or a Liquid?

Grade Level: 1st

Standards:

Pennsylvania Academic Standards
1.1.1.C: Use increasingly robust vocabulary in oral and written language.
1.2.1.A: Demonstrate concepts of print and identify text organization and use content to derive meaning from text.
1.2.1.C: Identify essential information within and across a variety of texts.
1.2.1.D: Make inferences and draw conclusions citing evidence from the text to support answers.
1.2.1.E:
Read and respond to essential content of text.
1.3.1.A: Read, understand, and respond to works of literature.
1.4.1.B: Write informational pieces using illustrations when relevant (e.g.,
descriptions, letters, instructions).
1.5.1.A: Identify and write about one specific topic.
1.5.1.D: Write using adjectives, precise nouns, and action verbs.
1.5.1.F: Use grade appropriate conventions of language when writing and editing.
1.6.1.A: Listen actively and respond to others in small and large group situations with appropriate questions and ideas.
1.6.1.B: Use appropriate volume and clarity in individual or group situations and deliver brief oral presentations on a topic supported by visual aids.
1.8.1.A: Generate appropriate questions about a topic.
1.8.1.B: Locate and discuss information on an identified topic in a small group, with teacher guidance.
1.8.1.C: Create and explain a research-based project in a small group.
2.6.1.A: Gather data from surveys and observations within the classroom or homes.
2.6.1.B: Organize and display data using pictures, tallies, charts, bar graphs and pictographs.
2.6.1.C: Describe data displayed in a diagram, graph or table.
2.6.1.D: Answer comparative questions based on representations of data.
2.7.1.D: List or graph the possible results of an experiment.
2.7.1.E: Answer questions about predictions and actual outcomes based on data.
S3.C.1.1.1: Describe matter in terms of its observable properties (e.g., weight, mass, shape, size, color, texture, state).
S3.C.1.1.2: Classify matter using observable physical properties (e.g., weight, mass, shape, size, color, texture, state).
S3.C.1.1.3: Classify a substance as a solid, liquid, or gas.

Essential Questions:
- Why should students develop investigating and observation skills?
- How does asking questions and seeking answers help students learn?
- How can properties of matter be

Enduring Understandings:
- Investigating and making observations about the world around us can help us learn about new things and experiences.
- Asking questions and seeking the answers to those questions through observations and
Students Will Know…
- Properties of different states of matter.
- How to ask relevant and appropriate questions.
- How to make observations using their sense of sight and touch.
- How to use observations to formulate a conclusion and be able to explain their choice.

Students Will Be Able To…
- Ask questions and make observations using their senses.
- Use observations to construct a reasonable explanation.
- Identify properties of solids and liquids.
- Classify objects as solids or liquids.
- Explore properties of a substance that has properties of both solids and liquids.

Materials:
- Lab coats
- Construction paper and masking tape to cover tables
- Foil bowls
- Tongue depressors
- Corn starch
- Water
- Poster paper
- Markers
- Bartholomew and the Oobleck by Dr. Seuss
- Conclusion worksheet

Assessments:
Pre-Assessment:
Students will generate a list about what they already know about Oobleck after reading the story, classify different solids and liquids and make a prediction about what Oobleck is.

Formative Assessment:
Students will make observations and predictions about Oobleck’s state of matter based on what they know about solids, liquids and gases and through manipulation of the cornstarch and water substance.

Summative Assessment:
Students will come to a conclusion about what state of matter Oobleck is based on their knowledge, observation, manipulation and exploration of Oobleck.

Adaptations:
Students who struggle with observations, predications and conclusions will be prompted with guiding questions from the teacher and one-on-one assistance.

**Procedures:**

**Day One**

1. Students will sit on the carpet.
2. Teacher will show the cover of Bartholomew and the Oobleck and ask for a raise of hands for who has read the book before.
3. Teacher will read Bartholomew and the Oobleck stopping occasionally to ask comprehension questions.
4. Teacher will display Oobleck prediction poster and tell students that we are going to try to figure out what Oobleck really is.
5. Teacher will ask students what they think Oobleck feels and looks like and record students’ thoughts as they try to describe Oobleck.
6. Teacher will display pictures of different liquids and solids and have students sort them into groups.
7. Once pictures are sorted students will come up with describing words that all of the pictures have in common and teacher will write them on the poster.
8. Teacher will ask students what group (liquid or solid) Oobleck might fit into.
9. Teacher will tell students that we are going to graph our predictions.
10. Each student will come up to the board, receive a sticky note and place it either voting for solid or liquid.
11. Teacher will explain that scientists all over the world have been trying to figure out what Oobleck is and they need our help.
12. Teacher will ask students if they are willing to become scientists for the afternoon to figure out what Oobleck is? Students will probably go nuts.
13. Teacher will tell the class that today we are going to find out what Oobleck feels and looks like because we are going to make it!
14. Teacher will go over the responsibilities of a good scientists and expectations of the activity:
   a. Teacher will explain that Oobleck can be very messy and ask students what they think scientists do to keep themselves clean while they do experiments. Students might say goggles, lab coats, masks, etc. Each student will receive a special scientists coat to keep their clothes clean and not get Oobleck on himself or herself. Students must keep their lab coats on the entire activity. When students’ hands are messy with Oobleck, they may not touch other things and get Oobleck everywhere – Oobleck must be kept in the container.
   b. Teacher will explain that we will only be using our eyes and our hands to learn about Oobleck. Students may not put Oobleck in their mouths to taste it.
   c. DO NOT put Oobleck in the sink. When I tell you it is time to clean up you must throw away the entire container in the big trashcan.
This is going to be a really fun experiment but if you cannot follow the rules, you will have to throw away your Oobleck and your lab coat and do silent reading until the end of the day.

15. Teacher will announce that now they have all of the information they need, and are ready to be scientists.
16. Teacher will instruct students to line up at the blue table to get their lab coats, put their lab coats on, and sit on your hands while teacher distribute the Oobleck.
17. Teacher will pass out bowls of Oobleck and tell students not to touch anything.
18. Teacher will tell students to talk with the other scientists at your table about what Oobleck looks like only using their eyes for 2 minutes and set a timer.
19. Students will share their observations about what Oobleck looks like as teacher writes it down on the Oobleck poster.
20. Teacher will tell students that they can use their hands to feel the Oobleck and talk with their tables about their observations for 5 minutes.
21. Students will share their observations about what Oobleck feels like as teacher writes it down on the Oobleck poster.
22. Teacher will tell the students to try picking up the Oobleck in their hands. Does it feel like a solid or a liquid? Why? What happens?
23. Teacher will tell students to hit the Oobleck with their hand hard. Does it feel like a solid or a liquid? Why? What happens?
24. Teacher will tell students to put finger into the Oobleck slowly. Does it feel like a solid or a liquid? Why? What happens?
25. Teacher will tell students to touch the Oobleck kind of hard and quickly.
26. Students will share or take turns doing this.
27. Teacher will ask when you hit the Oobleck, what did it feel like?
   Teacher will write down observations.
28. Teacher will ask students to lightly touch the Oobleck. Does it feel like a liquid or a solid? Why? What happened?
29. Teacher will tell students that they can play with the Oobleck for a few more minutes and talk with their table about what they are noticing.
30. Teacher will dismiss tables one at a time to throw away their containers and wash their hands and complete the Oobleck worksheet where they will write adjectives to describe Oobleck and then make a conclusion about whether they think Oobleck is a solid or a liquid and why.
31. At the end of the day, teacher will explain to students that EVERYONE IS RIGHT! Oobleck is both a solid and a liquid. It is a special kind of matter called a non-Newtonian fluid that has traits of both liquids and solids.