OVERVIEW
In this activity, campers will be learning about the different states of matter and working with Oobleck- a mixture that has the properties of both a liquid and a solid.

TOPIC AREA(S)	**GRADE LEVEL**
Chemistry	Grade 1 and 2

QUESTIONS PRIOR TO THE LESSON/GETTING EXCITED

- Who knows what the difference is between a liquid and a solid?
- What are some examples of liquids and solids that we see everyday?
- Who has ever played with or made slime?
- Would you say that slime is a liquid or a solid?
- Do you think it is possible for an object to feel like a solid and a liquid at the same time?

BACKGROUND INFORMATION FOR INSTRUCTORS (INCLUDE QUESTIONS W/ ANSWERS)

Matter is all around us and is defined as anything that has mass and takes up space. Matter exists in three main forms: solids, liquids and gases. Today we will be focusing on solids and liquids.

Solids are materials that have a definite shape and volume that is rigid and isn't easily changed. Solids have properties used to describe them such as hardness, texture, size and shape. Liquids also known as fluids, are a type of matter that changes shape depending on its container. For example, when you pour milk into a cup, it takes up the shape of the cup. Fluids have properties to describe them such as temperature and viscosity (how easily a liquid flows)

When the viscosity of a liquid (how easily a liquid flows) is determined by a liquid's temperature this is known as a Newtonian Fluid. When a temperature of a fluid increases, its viscosity decreases. For example, when honey is put in the fridge, it is much harder to pour than when it is heated or left at room temperature. A non-Newtonian fluid is a fluid that's viscosity is dependent on the amount of pressure applied. Everyday examples include quicksand, shaving cream and even ketchup. All three of these substances appear to be a fluid until some kind of pressure is applied. For example when Ketchup is stuck in the bottle, we bang the bottom to get the last bit out, by applying pressure to the bottle we are increasing the fluidity of the ketchup so it can be more easily poured from the bottle.

Today we will be working with the non-Newtonian fluid: Oobleck. At first glance Oobleck looks very similar to slime but after further investigation we will be able to see what makes Oobleck unique. What do we think will happen when we push down on the Oobleck? What do we think will happen when we release our hand and stop applying pressure? Oobleck is a

substance somewhere in between a liquid and solid. It pours like a liquid but acts like a solid after we squeeze it.

RELEVANCE TO THE CURRICULUM			
Grade 1 and 2	Grade 3 and 4	Grade 5 and 6	Grade 7 and 8
€ Needs & Characteristics of Living Things € Growth and Changes in Animals € Materials, Objects and Everyday Structures € Movement € Energy in Our Lives € **Properties of Liquids and Solids** € Daily and Seasonal Changes	€ Growth and Changes in Plants € Habitats and Communities € Strong and Stable Structures € Pulleys and Gears € Forces Causing Movement € Light and Sound € Soils in the Environment € Rocks and Minerals	€ Human Organ Systems € Biodiversity € Forces Acting on Structures and Mechanisms € Flight € Properties of and Changes in Matter € Electricity and Electrical Devices	€ Interactions in the Environment € Cells € Form and Function € Systems in Action € Pure Substances and Mixtures € Fluids € Heat in the Environment € Water Systems

€ Air and Water in the Environment		€ Conservation of Energy and Resources € Space	

MATERIALS (SPECIFY WHETHER PER CAMPER, GROUP OR CLASS)

-Cornstarch
-Water
-Container for corn-starch and water
-Newspaper or paper towel (for possible spillage)

SAFETY CONSIDERATIONS

Campers advised not to taste the Oobleck. The corn-starch and water mixture can be messy and paper towels and hand wipes should be available to clean any mess.

PROCEDURE

1. In a bowl or container, add two cups of cornstarch and one cup of water using a strong spoon or hands to mix
2. Let campers manipulate the Oobleck with their hands and encourage campers to manipulate the Oobleck using various techniques.
3. Prompt campers to note what happens when they grab a handful of oobleck and squeeze it and then open their fist, quickly smack the oobleck with their hand or hard object and when they try to roll the oobleck into a ball.
4. Ask campers to explain if they feel that Oobleck is most like a solid or liquid or both.\

5. Clean up Oobleck by discarding it into the trash ensuring it does not go down the sink.

REFERENCES

https://kristinmoonscience.com/non-newtonian-fluids-explained/