**Additional Activities for the Matter Unit**

**Oobleck and Glurch**

**Materials:**

* Cornstarch
* Water
* Big plastic bowl
* Shallow pans
* Newspaper
* Beakers
* Spoons
* Graduated cylinders
* Glue
* Borax
* Food coloring
* Stirring stick
* Containers for glurch solutions
* Saran wrap

**Directions:**

1. **Make a vat of oobleck before class begins.** See the teacher instructions.
2. Break the students up into small groups (pairs) and give each group a shallow pan (with newspaper spread out below the pan for easy clean-up) and pour some oobleck in each group’s pan. Give groups additional materials as necessary.
3. Tell the students to experiment with the oobleck and write down all of their observations in their science notebooks. Students may make a chart to record their observations or copy a chart from the board. Some things that the students might consider are the following:
   1. Push Test - Can they push into it?
   2. Pick Up Test - If they pick some up, does it all come up?
   3. Pour Test - Does it pour smoothly or just fall out in a clump?
   4. Shape Test - Does it keep the same shape in different containers?
   5. Other tests: Try to stir it with a spoon (spoon can go in slowly but can not be stirred quickly), put it in on the palm of a hand (puddle) and then squeeze it into a fist (solid and then back to a puddle)
4. Clean up the oobleck and ask students to write in their science notebooks and explain if oobleck is a solid or a liquid. Lead a discussion with the entire class to discuss how oobleck acts like a solid and how it acts like a liquid. *Share the following information at your discretion:* Oobleck is a non-Newtonian liquid. Under a small amount of pressure (pushing), it behaves like a liquid and under more pressure (pushing) it behaves like a solid.
5. Tell the class that now they will investigate another type of mysterious substance to learn more. **Make a saturated solution of borax and a solution of 50% glue and 50% water (with food coloring) before class.** **See the teacher instructions.**
6. Give each group equal amounts (100mL) of the borax solution in one beaker and the glue solution in another beaker. When all of the groups have the two beakers instruct them to mix the solutions together and stir (using a wooden stick).
7. Tell the students to experiment with the glurch and write down all of their observations in their science notebooks. Students may make a chart to record their observations or copy a chart from the board. Some things that the students might consider are the :
   1. Push Test - Can they push into it?
   2. Pick Up Test - If they pick some up, does it all come up?
   3. Pour Test - Does it pour smoothly or just fall out in a clump?
   4. Shape Test - Does it keep the same shape in different containers?
   5. Other tests: Does it bounce?
8. Clean up the glurch (students can take it home wrapped in saran wrap but it can get out on the bus and cause problems) and ask students to write in their science notebooks and explain if glurch is a solid or a liquid. Lead a discussion with the entire class to discuss how glurch acts like a solid and how it acts like a liquid. *Share the following information at your discretion:* Glurch is a polymer (long chains of molecules and atoms linked together). The liquid water gets trapped in the polymer matrix so it will pour slowly although it seems like a solid.
9. Discuss the following questions with the class. Did these materials act the way you thought they would? Why or why not? Does everything fit into the categories of solid, liquid, or gas? What might happen if we mixed the glurch and the oobleck? (You can do this for the class if time permits.)

**How to Make Oobleck**

1. Place have a quart of water in a big bowl with food coloring (optional).
2. Add cornstarch and stir. Keep adding the corn starch and stirring until the mixture gets thicker (May take around 2 boxes of corn starch.)
3. When you have oobleck, you will know it!
4. Pour some of the oobleck into the shallow pans for each group.

**How to Make Glurch**

1. In one container make a solution of 50% water and 50% white glue (mix). If you have 10 groups of students, each using 100mL of liquid, make around 1 L.
2. In the second container make a saturated borax solution. Put warm water in the container and add borax, with shaking) until no more borax will dissolve in the water.
3. Give the students equal volumes of each solution to mix.
4. Note: The student mixture will consist of a blob of glurch and quite a bit of liquid. Have the students drain the glurch, dry their hands, and experiment!