



# High Touch High Tech<sup>®</sup>

Science Experiences That Come To You™

## Oobleck ©

*\*notes for parents\* do not dispose of Oobleck down the drain. Only throw it out in the trash.*

### Supply List

- Pie pan
- 1.5 cups of cornstarch
- 1 cup of water
- ½ cup measuring cup.
- Liquid measuring cup

### Background info:

**Oobleck** is a **suspension** of cornstarch and water that can behave like a solid or a liquid depending on how much pressure you apply. Try to grab some in your hand, and it will form a solid ball in your palm until you release the pressure. Then, it will flow out between your fingers. Materials that behave this way are classified as **non-Newtonian fluid** because their flow properties are not described by a constant viscosity. The name Oobleck comes from the 1949 children's book, *Bartholomew and the Oobleck*, by Dr. Seuss. In the story, a sticky liquid falls from the sky as a result of the king becoming bored with normal weather.

### Procedure:

1. Put 1.5 cups of cornstarch in a pie pan
2. Add one cup of water and stir well
3. Add more water or cornstarch until you get a mixture that “tears” when you quickly scrape your finger through it and then melts back together again.
4. Squeeze it, squish it, scoop it, pinch it...what happens?
5. The first thing you can do is simply place your hands into the Oobleck and start squeezing it. Have some fun! Try to make a ball by moving it around quickly in your palms. Once you stop applying pressure to the mixture, it will flow out of your hands like a liquid.
6. Try filling a pie plate with a thick layer of Oobleck and then slapping the surface with your open hand. Because of the dilatant properties, becoming more viscous when a force is applied, the liquid will all stay in the plate. Try the same experiment with water and compare the results!

### Science Behind it:

All fluids have a property known as **viscosity** that describes how the fluid flows – commonly thought of as how thick or thin a fluid is. For instance, honey is much more viscous than water. When a fluid's viscosity is constant, it is referred to as a Newtonian fluid. Oobleck is an example of a fluid whose viscosity is not constant; its viscosity changes depending on the stress or forces applied to it. If you poke it with your finger and apply a large force, it becomes very viscous and stays in place. If you gently pour it, applying little force, it will flow like water. This kind of fluid is called a dilatant material or a shear thickening fluid. It becomes more viscous when agitated or compressed.

When sitting still, the granules of starch are surrounded by water. The surface tension of the water keeps it from completely flowing out of the spaces between the granules. The cushion of water provides quite a bit of lubrication and allows the granules to move freely. But, if the movement is abrupt, the water is squeezed out from between the granules and the friction between them increases rather dramatically.