

How to Make Oozing Oobleck

Inspired by Mika Rottenberg's
Spaghetti Blockchain



Mika Rottenberg is an Argentinian-born artist who works in New York City. Her film, *Spaghetti Blockchain*, which is also the title of her exhibition at MOCA, shows colourful objects being melted, burned, squished, and sliced. In many of her films, Mika explores materialism, and the different ways we can interact with matter.

When we handle an object or material, it will behave based on its state of matter - solid, liquid, or gas. But what if a material acted like two different states of matter?

In this activity from the Ontario Science Centre, try your hand at creating **Oobleck**, a fascinating material that acts like both a solid and a liquid at the same time.

Make a non-Newtonian fluid that can change from a liquid to a solid instantly

What you'll need:

- Large bowl
- Mixing spoon
- 2 cups of cornstarch
- 1 to 2 cups of water
- Food colouring
- Items to play with your Oobleck: animal figurines, toy cars, bouncy balls, or choose kitchen tools you'd like to use to poke, prod, sift or drip your Oobleck



Mika Rottenberg, *Spaghetti Blockchain*, 2019. Still from single-channel video installation. Courtesy the artist and Hauser & Wirth.

Activity setup:

1. Make Oobleck that is blue, orange, red or any colour you want. Add a few drops of your chosen food colouring and mix it with the water before you begin.
2. Pour cornstarch into an empty bowl.
3. Slowly add 1 cup of water to the cornstarch while stirring constantly. You might not need all the water. Add just enough so that the mixture is thick, and the cornstarch is well mixed.
4. Test out your Oobleck. To make your Oobleck the right consistency, you have to play and experiment with it! Tap on the mixture with your hand. Is it solid when you hit it? If your mixture is too runny, add a little bit more cornstarch. If it is too thick, add a little bit more water.



How to play:

- Put your fingers in the Oobleck. Move very slowly in a large circle, then quickly in small circles. How does it feel?
- Place toy cars or figurines on top of the Oobleck, or lay a spoon on the surface. What happens?
- Moving as quickly as possible, place a big spoonful of Oobleck into your hand, making sure to catch one of the toys or items you put in the Oobleck. Roll the Oobleck into a ball and squeeze it tightly. Now open your hand and watch the Oobleck ooze between your fingers, revealing the hidden item.
- If you have a family member or friend nearby, make another ball of Oobleck and transfer it into their hand. Trick them with a fun surprise inside!



Clean-up:

- When you are finished playing with your Oobleck, you can store it for a day or two by covering the bowl. The next time you want to use it, you may need to add a bit more water to reach the correct consistency.
- **IMPORTANT:** Dispose of your mixture by putting it in the garbage or compost, **NEVER** down the sink, as it will clog your pipes.



How does it work?

You've just made Oobleck, a non-Newtonian fluid. Most liquids are Newtonian fluids, with the same viscosity—a measure of how easily a liquid flows—all the time. Newtonian fluids change their typical viscosity to become thick or runny if the temperature changes. Cold honey, for example, will flow more slowly than warm honey. Non-Newtonian fluids behave differently. They can switch between acting runny and thick depending on how much force you use—just like your Oobleck.

Oobleck is made from cornstarch and water. Cornstarch has long molecules (or chains) of starch. When you add water, the long molecules dissolve in the water and stay nicely lined up next to each other. If you move a spoon very slowly through the mixture, the fluid is runny and allows the long molecules to move aside and flow past each other. If you move a spoon quickly, the long molecules tangle up, the liquid becomes thicker, and movement stops.

Did you know?

This material gets its funny name from the Dr. Seuss book *Bartholomew and the Oobleck*. In the book, Oobleck is a mystery substance that falls from the sky.

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