

## LEARNING MATERIALS

### Non-Newtonian liquid

Viscosity is a fluid's resistance against force. Fluids that have a constant viscosity, independent of the force we apply, are called Newtonian, but not all liquids follow this rule. If the viscosity of a liquid depends on the force we apply, it is called non-Newtonian, and these fluids are fun to play with.

You don't need a sophisticated lab to create a non-Newtonian liquid. In this experiment we make a non-Newtonian fluid with cornstarch. The viscosity of this liquid varies according to the force we apply. If we apply more force, the amount of viscosity will increase, and it feels like the liquid becomes more like a solid. When we decrease this force, it will behave more like a liquid.

#### Questions for testing comprehension:

- (1) Does the ratio of the water to cornstarch can change the viscosity?
- (2) Do you know any other non-Newtonian liquid?
- (3) Which one makes a better non-Newtonian liquid, fine or coarse powder?

#### Further reading and materials:

- (1) [https://en.wikipedia.org/wiki/Non-Newtonian\\_fluid](https://en.wikipedia.org/wiki/Non-Newtonian_fluid)
- (2) <https://www.stevespanglerscience.com/lab/experiments/non-newtonian-fluid/>
- (3) <https://youtu.be/JJfppydyGHW>
- (4) <https://en.wikipedia.org/wiki/Viscosity>