Make a non-Newtonian fluid

Most liquids behave in ways that we expect: they flow, they splash, they pour, they change their shape to fit their container. Not all liquids behave in this way at all times, however. You can very simply mix up a fluid which behaves in some surprising ways.

This can get messy so you may want to cover where you are working with newspaper and wear an apron and plastic gloves.

You will need:

- 225 g cornflour
- 230 ml water
- A large plastic mixing bowl
- Spoon (optional)
- Small plastic food bag

What you do:

Put the cornflour into the bowl and add the water. Stir together thoroughly using either your hands or a spoon. You can add some food colouring at this point if you wish, but it does make the mixture messier.

Keep mixing until the mixture is smooth and around the consistency of honey, adding a bit more cornflour or water as necessary.

Now try these:

The mixture is great to experiment with; here are a few suggestions:

- Try punching the mixture hard and quickly. Then hit it repeatedly. Most liquids will splash, but this mixture turns hard, resisting your hand. This is because under the force of the punch the water flows away leaving a dense patch of cornflour particles under your fist.
- Contrast this with pushing the mixture slowly. How does the liquid respond differently?
- Put some onto a flat surface and try pushing it with your finger. Can you see the cornflour and liquid begin to separate out again?
- Scoop up some of the mixture and roll it into a ball in your hands. As long as you keep rolling it and applying pressure it will stay in the ball shape. Once you stop it will flow back into the bowl like a liquid.
- Try adding more water or cornflour to change the consistency of the mixture. How does this change the properties?

Disposal: Do not put the fluid down the sink as it can block it. Put it in a bag, tie the top and dispose of in the bin.

Uses: The cornflour slime fluid is described as 'non-Newtonian' because its behaviour depends on how fast you try to move it. It is fun to play around with, but uses have been found for fluids like these too, including in armour.

Vicky Wong is Chemistry editor of Catalyst.

It flows like treacle …

… but you can roll it into a ball.

Dispose of with care.

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