

Activity- Cornflour slime- liquid or solid?

What you need:

- cornflour, as much as you can
- water
- a bowl

What to do:

Put most of the cornflour in the bowl

- Slowly add water to the cornflour until it starts to behave 'strangely' – you'll need about twice as much cornflour than water so be careful not to add too much!
- Move your hand through the mixture, first slowly then quickly
- Try to punch the mixture! Have some fun and play around with it.

What you may notice:

When you move your fingers slowly through the mixture, it acts like a liquid. When you punch it or squeeze it, it behaves like a solid

The science behind it all:

There is lots of science going on in this simple experiment. Cornflour is made up of lots of tiny starch particles and when it is mixed with water, the starch particles become suspended in liquid as the water moves in between them. The water acts as a lubricant so when you move the mixture slowly, the particles have time to move past each other and the mixture acts like a liquid.

When you apply rapid force to the mixture, the starch particles move slightly and lock together. All the water that filled the cracks between the particles moves into little gaps. Instead

of having lots of lubricated individual particles, the particles form into a solid structure which cannot flow and the mixture acts like a solid.



Beyond the science:

The cornflour-water mixture is an example of a non-Newtonian fluid. Newtonian fluids, such as water, maintain a constant viscosity (the measure of a fluid's resistance to flow) unless the temperature or pressure changes. Non-Newtonian fluids are affected by other forces. In the case of the cornflour-water solution, when you apply

force, it behaves like a solid. Non-Newtonian fluids are categorised depending on how they flow and while the type of flow in the cornstarch-water solution isn't common in the food industry, there are many substances that exhibit non-Newtonian fluid behaviour such as ketchup, mayonnaise or yoghurt ... although I wouldn't recommend punching these!

