CHaOS SCIENCE ROADSHOW

CHaOS@Home Experiment Files

Cornflour

Exploring Non-Newtonian Fluids

About CHaOS

Cambridge Hands-On Science - CHaOS for short - is a volunteer led group from the University of Cambridge.

We believe that science is fun and relevant to everyone! CHaOS take our wide range of hands-on science experiments & enthusiastic student demonstrators to venues across the country!

We always love to hear what you think of our experiments - so to get in touch, find even more experiments, and see more of what we do, visit our website!

www.chaosscience.org.uk

Disclaimer
This experiments should only be carried out **under supervision of a responsible adult.**
Teachers should perform a risk assessment before use.

I'm **Boris Bones**, the friendly CHaOS skeleton. I'm going to guide you through this experiment!

Today, we'll be thinking about different states of matter. Can you name three of them?

Make a mess with a slimy cornflour/water mix and explore its unusual properties.

YOU'LL NEED

Large bowl,
Cornflour,
Water,
Spoon,
Bin bag (to keep things clean!)

SAFETY

Cornflour may trigger an **asthma attack,** perform the experiment **outside** to reduce risk (and mess!)
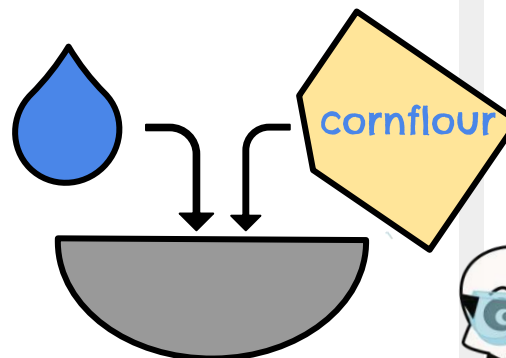Cornflour **may irritate eyes.** In case of contact, **wash with plenty of water**.
Clear any **spills** quickly so you don't slip on them.
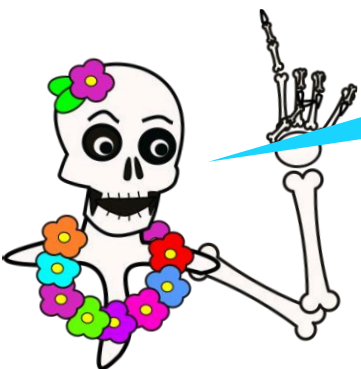
How to do the experiment

Step 1

Add cornflour and water in a 10:1 ratio into the large bowl and mix!

cornflour

What happens if you don't add enough water? What happens if you add too much?

Step 2

Move your hand slowly through the mixture, what state is it?

TOP TIP
This may get messy, so consider putting down a bin-bag or doing the experiment outside!

Make a note of how the cornflour looks and feels as you push it, stir it, hit it, scoop it, dribble it...

Step 3

Try moving your hand through the mixture quickly, or quickly punching the surface of it. What has changed?

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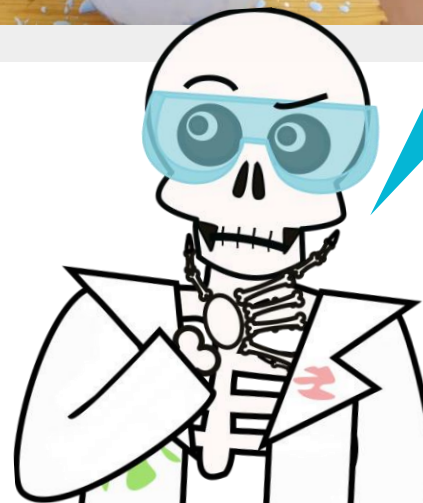
Mixing cornflour and water creates a **non-newtonian fluid**. This means that its "thickness" (also known as **viscosity**) changes when a **force** is applied. When you hit the cornflour with your hand, or just move your hand quickly!, you are applying a force, so the mixture suddenly gets thicker.

Cornstarch exists as **small grains** in the water. Slow movement allows water to move between the cornstarch grains reducing friction. The water is acting as a **lubricant**. Fast movement pushes the water out and friction between grains is increased.

Liquid   Solid

Fun fact!

While chocolate is being made it is in a liquid state which is a **non-Newtonian fluid**. The molten chocolate must be stirred but we don't want to jam the machines. Molecules called **emulsifiers** are added to lower the friction between grains of sugar and cocoa. This lets chocolate-makers to include less fat in the chocolate, making it less unhealthy.

Can you think of any other non newtonian fluids?
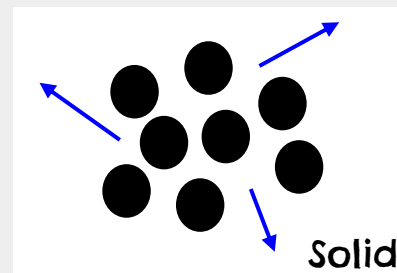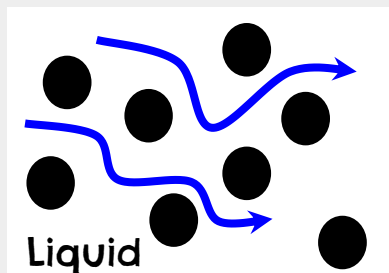
Want more?

Check out more of our chemistry experiments! Try "Cleaning Coppers" or "Mini Explosions".

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