

2.3 Slime – what is its state?

At the end of this activity students will be able to:

- identify the state of a substance that doesn't behave as expected
- give everyday examples of where fluids don't behave as expected.

What ideas might your students already have?

Students will be familiar with the general properties of the three states of matter and be able to identify the states of everyday materials.

Equipment list

Each GROUP will require:

- 1 cup (250 mL) water
- 1 cup of cornflour*
- a container (e.g. ice-cream container)
- stirring rod or spoon
- food colouring (optional)**

Each STUDENT will require:

- **Notebook**
- Access to **Student Digital**

Things to consider and hints for success

*This activity will only work using cornflour from corn/maize. Read the pack carefully, as most supermarket 'cornflour' is made from wheat.

**Take care, as too much food colouring will stain hands.

Students should complete a *Risk Assessment* before commencing this activity.

Teacher content information:

Fluids which flow easily are said to have low viscosity (e.g. water), whereas fluids which do not are said to have a high viscosity (e.g. cold honey). Cornflour slime is a special type of fluid that doesn't follow the usual rules of fluid behaviour. When pressure is applied to slime, its viscosity increases and the cornflour slime becomes thicker. At a certain point, slime actually seems to lose its flow and behave like a solid. Cornflour slime is an example of a shear-thickening fluid.

The opposite happens in shear-thinning fluids; they get runnier when you stir, shake or compress them. For example, when toothpaste is sitting on a toothbrush it is so thick you can turn the brush upside down and the toothpaste doesn't drip off. But if it was that thick when you tried to squeeze it out of the tube, you would not be able to. Fortunately, toothpaste gets runnier when you squeeze (compress) it. Other shear-thinning fluids include blood, paint, ballpoint pen ink, nail polish.

Lesson plan

Step 1: Groups make slime then answer the discussion question.

Discussion question:

What substance test could you use to help you classify slime?

Step 2: Students work through the activity to find an explanation for their observations.

Step 3: Students complete the activity by researching Newtonian and Non-Newtonian fluids.