

Explorer Education Programme



Explorers Science Experiments - Goo/Oobleck Solution

Class: 3rd-6th

Strand: Materials

Strand Unit: Properties and characteristics of materials / Materials and change

Group size: 3-5 students

Aim

To introduce students to chemistry by observing non-Newtonian solutions and to examine the physical effect pressure has on these substances.

Students completing the worksheets will also develop writing and literacy skills.

Experiment suitable for teacher demonstration and/or supervised group experiment for 5th and 6th Class students.

Materials

- Corn flour
- Water
- 1 large bowl

Methods

1. Add corn flour to a large bowl. The amount added will determine the amount of goo produced.
2. Slowly add water to the bowl.
3. Keep mixing the water and corn flour together.
4. The solution should be solid if pressure is applied but remains as liquid if pressure is removed. It may take some practice to get the right amounts but you can always keep adding more corn flour and water to fine tune the mixture to the optimum levels.

What Happens

- Corn flour mixed with water forms a non-Newtonian liquid, which means it gets harder the more pressure is applied to it (its viscosity changes).
- This means that when you apply force you can pick it up, and it acts as a solid.
- When you release the force it acts as a liquid.
- If you place some on a plastic plate and hit it, it will break up into smaller pieces, then flow back together.

Discussion Points

- Before the experiment discuss with the class what a non-Newtonian solution is.

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- Then discuss what they think will happen when water and corn flour are mixed.
- Ask them do they think it will flow or stay solid.
- Once everyone has carried out the experiment, discuss what happened and why. Focus the discussion on the differences with Newtonian solutions that either flow or don't regardless of pressure application.
- Have the students ever encountered another non-Newtonian solution before and if so what was it?
- What would the world be like if the Oceans were made up of a non-Newtonian instead of water?
- Get students to use the web and/or their school library to research these discussion points and the worksheet questions.

Outcome

The children in the class will have developed skills in the following:

- Questioning
- Observing
- Predicting
- Investigating and experimenting
- Analysing
- Recording and communicating
- Exploring
- Planning
- Making
- Evaluating

In addition the following skills in English will be developed:

- Reading for pleasure and information
- Developing competence, confidence and the ability to write independently
- Developing interests, attitudes, information retrieval skills and the ability to think

Useful Links

- <http://www.sciencelearn.org.nz/Science-Stories/Strange-Liquids/Non-Newtonian-fluids> - other Oobleck
- <http://www.geekologie.com/2008/07/nonnewtonian-fluid-on-subwoofe.php> - Subwoofer expansion



Worksheet

What do you think will happen when water and corn flour are mixed?

My prediction	Will it flow or stay solid?
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Can you name another non-Newtonian solution?

What do you think the world be like if the Oceans were made up of a non-Newtonian solution instead of water?