Quicksand

Download the teacher notes,
student workbook and technician notes
that accompany this resource at
rsc.li/3PhT8f2.

ROYAL SOCIETY OF CHEMISTRY

Learning objectives

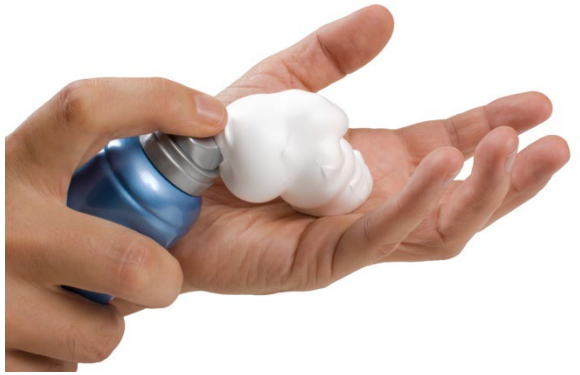
By the end of this session, you will be able to:

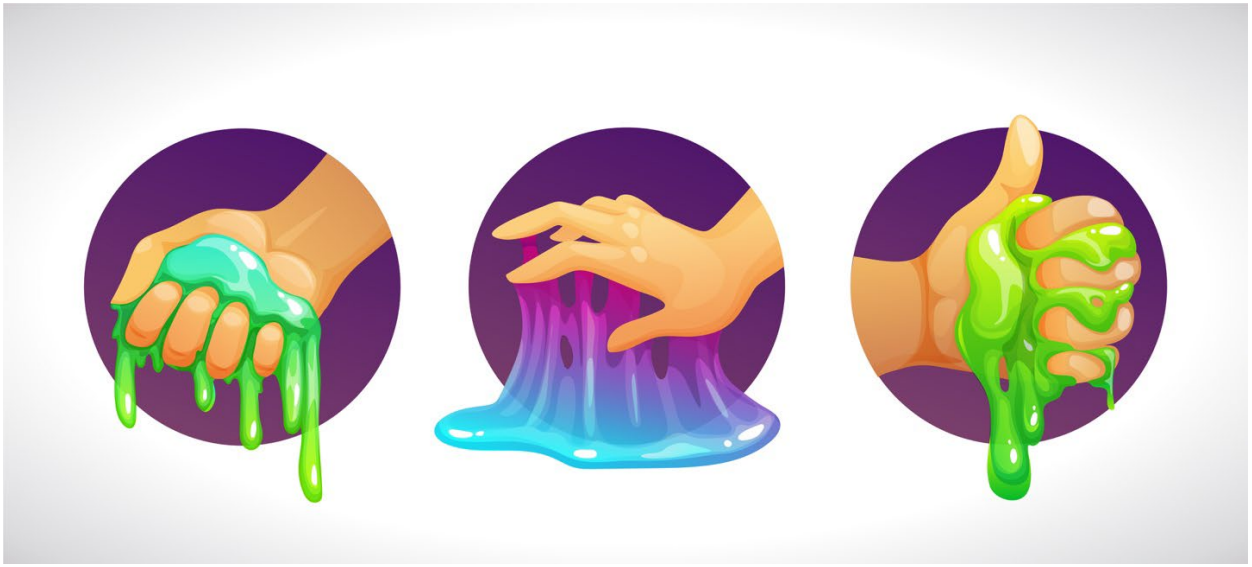
- Follow instructions for making a non-Newtonian fluid.
- Describe the properties of a non-Newtonian fluid.
- Apply information about the properties of a non-Newtonian fluid to another context.

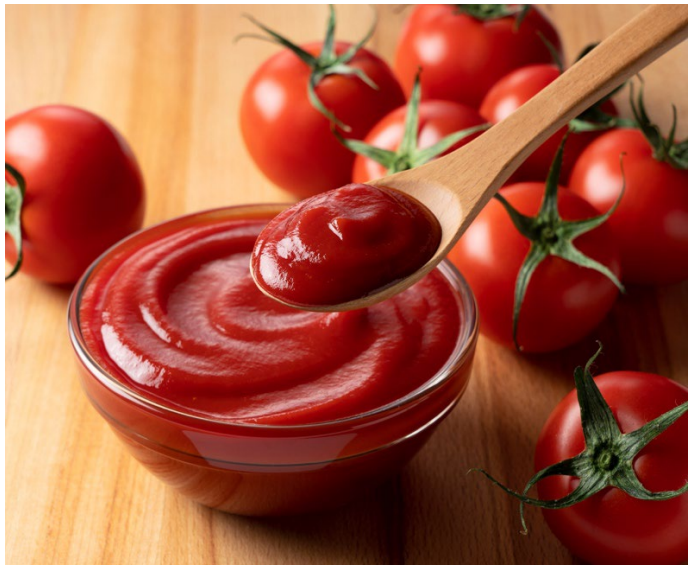
Non-Newtonian fluids

A non-Newtonian fluid can change its behaviour by acting as either a solid or a liquid depending on the force applied to it and the conditions surrounding it.

Examples of non-Newtonian fluids include slime, ketchup, shaving foam and quicksand.







Career link

Consumer products technician

Watch the video and meet Robert, a consumer products technician. He studies different materials' behaviours to develop and improve the properties of consumer products.

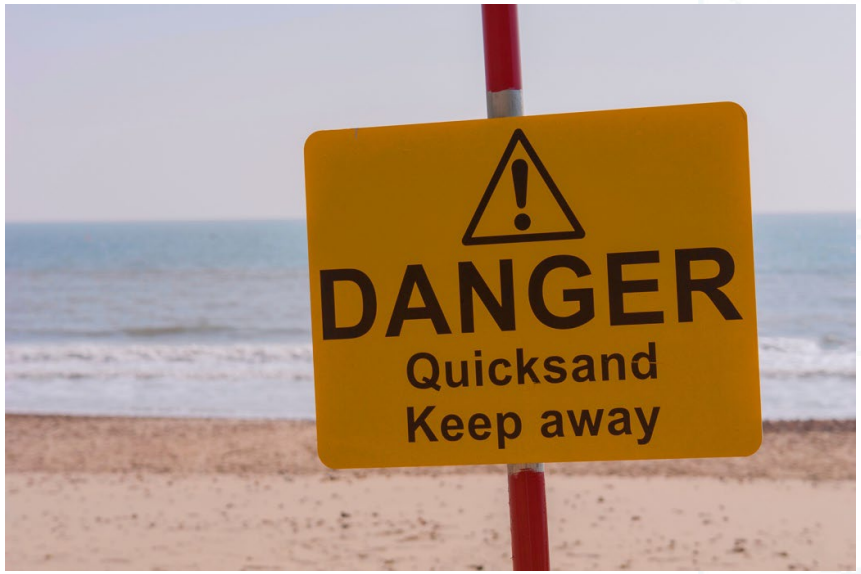
What is quicksand?

Quicksand is a non-Newtonian fluid usually found near riverbeds or the seashore.

It is made when water floods into sand quickly and is often formed where there are floods or underground springs.

Quicksand has unusual properties that make it difficult to escape from.

Humans and animals can easily get stuck and sink in quicksand.



Career link

Environmental chemist

Meet James, an environmental chemist, who helps to protect the environment by assessing the risks to life from certain chemicals in soil, water and air.

Activity 1

What is the best way to escape from quicksand?

▶ See student workbook

Activity 1

What is the best way to escape from quicksand?

You will make a sample of a non-Newtonian fluid called ooze.

Ooze is a colloid of tiny, solid particles of cornflour suspended in water which behaves in a similar way to quicksand.

Your task is to use ooze to find the best way to escape from quicksand.

Explore and answer the questions in your student workbook as you experiment.

Answers

(a) If a force is applied quickly, the ooze will resist movement and become more viscous, behaving like a solid. The ooze flows like a liquid when a gentle force is applied.

(b) To escape from quicksand, you should try swimming towards firm ground very slowly. The more slowly you move, the less the quicksand will resist your movement.

Challenge

i. You could walk on ooze by running quickly over it as it would then behave like a solid.

ii. Running would apply a force quickly, stopping you sinking into the ooze.

iii. There are many non-Newtonian fluids. Examples include ketchup, honey, toothpaste, some paints, blood, melted butter and shampoo.

Acknowledgements

This resource was originally developed by Liverpool John Moores University to support outreach work delivered as part of the Chemistry for All Project.

To find out more about the project, and get more resources to help widen participation, visit our Outreach resources hub: rsc.li/3CJX7M3.