

Bubble Trouble

Bubbles!

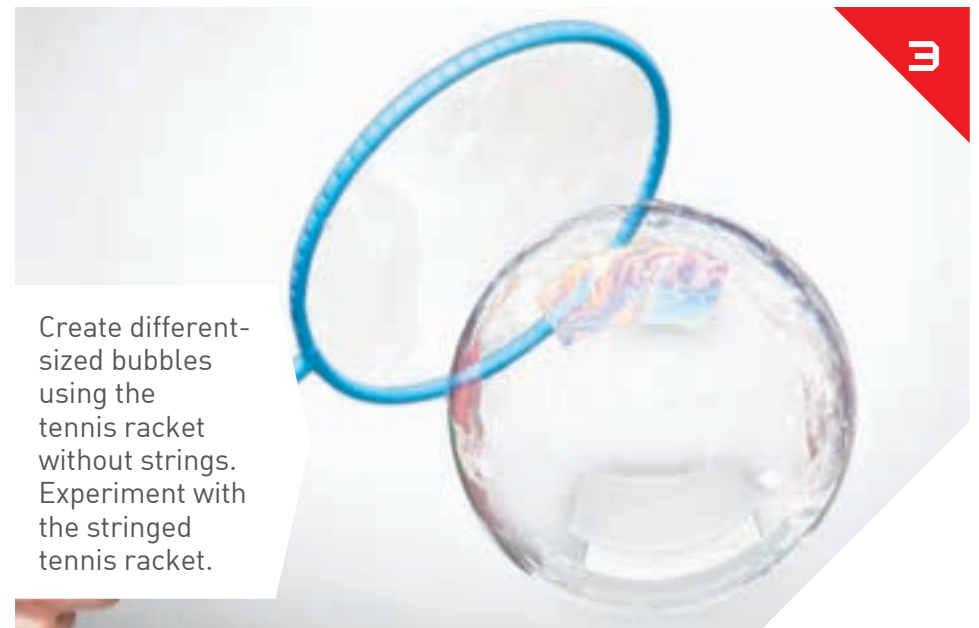


Grab this stuff:

- A** 7 litres of water
- B** 500 ml of washing-up liquid
- C** 500 ml of glycerol

- D** Tennis racket with strings
- E** Tennis racket without strings

Bubble Trouble



Bubble Trouble notes

Aims

- Predictions – pose questions and try to investigate the answers.
- Observation skills – learning that observation skills and evidence are important in reaching conclusions in science.
- Materials – describing and exploring the properties of water and the changes in the properties of water in bubble mix.
- Using glycerine in your bubble mix will help the bubbles to last longer and be stronger, potentially allowing more investigation. Do not add too much, though, as the bubbles will become too heavy.
- Bubble mix is very dependent on the outside environment (temperature, humidity, etc.).
- Although it is always tempting to run messy bubble activities outside, remember that bubbles do not like air that is too dry, or too much wind. On hot days mist the air with a plant water mister to help the bubbles last longer. In winter try placing a couple of bowls of water near radiators for an hour before you start the activity. And never attempt to blow bubbles in an air-conditioned room.

Practicalities and preparation

- This investigation is messy, so have cleaning materials available including absorbent cloths, towels and aprons.

The science – an introduction

A water molecule is made up of hydrogen and oxygen atoms that are attracted to each other. This attraction also causes surface tension, an attractive force that occurs on the surface of liquids. This means that if you try and blow a bubble using just water it will not work. When soap molecules (from washing-up liquid) are added to water this reduces the surface tension and enables you to blow bubbles.

Bubbles will always form a sphere because this shape has the smallest surface area for the volume of air in the bubble, and so takes the least energy to form.

Discussion

- Which blower makes the best bubble?
- Which mixture makes this bubble the best?
- Can you make bubbles from just water?
- Do you think you could make the bubbles even better? How?
- Did you change anything that you were doing along the way? Why?
- Do you think there are other ingredients that you would want to try?
- What else could you use to blow a bubble?

Extensions

- Run a challenge – for example, to make the largest bubble, the bubble that lasts the longest or the strongest bubble (e.g. bubble foam that can hold a polystyrene bowl with five marbles in it).
- Look at the shapes that bubbles make and learn about other 3D shapes and whether it is possible to get a bubble to make that shape. For example, does a square bubble-blower make a cube-shaped bubble?
- Blow paint bubbles onto paper by adding paint to your bubble mix and using a straw to blow them. This is a good way to record how large the bubbles were.
- Use the bubble activity to look at other things that float in the air and the similarities and differences between them (e.g. seeds or balloons).
- Shine a light under the bubbles so that you can look at the rainbow colours and talk about why this happens.
- Can you blow your own bubbles using your own hands?

Links to real life

We can see and experiment with bubbles in everyday life. When you are doing the washing up you can often see lots of bubbles. They are made by mixing the water you are washing up with and the washing-up liquid. You may be able to see a difference in the bubbles depending on what washing-up liquid you use and the temperature of the water.

Bath time is also a great time to explore bubbles. These bubbles are made from the bubble bath, shampoo or shower gel that you are using.

Bubbles also have a very practical use in your toolbox. A spirit level is a glass tube filled with ethanol and a single bubble. It indicates that a surface is level when the bubble is positioned exactly between two lines on the tube. You can see a modern spirit level in the *Making the Modern World* gallery in the Science Museum.

Links to the Science Museum

Galleries:

- Making the Modern World
- Launchpad
- Challenge of Materials

Further information

- Fizzy Fountain
- Milk Magic