

Fizzy Fountain

Create your own fountain, using nothing but fizzy pop and Mentos!



Grab this stuff:

- A** Roll of Mentos (mint sweets)
- B** 2 litre bottle of fizzy pop
- C** Plastic tray
- D** Tube

Fizzy Fountain



Fizzy Fountain notes

Aims

- Predictions – pose questions and try to investigate the answers.
- Investigation – learn about carbon dioxide (CO₂).
- Observation skills – you will experiment, watch what happens and make appropriate notes.
- Scientific inquiry – you will explore how different materials react together.
- If you are using an empty tube, such as an empty vitamin C tube, remove the bottle cap and carefully but quickly tip the Mentos into the bottle and stand back.
- If you are using a Geyser Tube, follow the manufacturer's instructions. It is important to bear in mind that once you have used a Geyser Tube it needs to be completely dry before you use it again. If it is still damp the Mentos may get stuck in the tube.
- This demonstration is best done outdoors because of the height of the eruption and the mess it creates. If you are going to be doing the experiment indoors, we recommend using a plastic mat. The mat should be quite a bit bigger than your plastic container because of the unpredictability of the eruption and the splatter radius.
- Different types of fizzy pop may require more or fewer Mentos.

Practicalities and preparation

- Do not shake the bottle of fizzy pop.
- If you are using a piece of paper as your Mentos dispenser, roll it up so it can comfortably hold the Mentos one on top of another. Once you have removed the bottle cap, carefully but quickly tip the Mentos into the bottle and stand back.
- Use diet fizzy pop where available – it seems to work better than the ordinary sugary kind. Some scientists speculate this has something to do with the artificial sweetener, although diet fizzy pop's chief benefit here is that it does not leave behind a sticky mess you would have to clean up.

The science – an introduction

Fizzy pop is basically sugar (or diet sweetener), flavouring, water and preservatives. Invisible CO₂ is what makes fizzy pop bubbly. It is pumped into bottles at the bottling factory under high pressure in a process known as nucleation. Until you open the bottle the pressure inside the bottle prevents the gas from turning back into bubbles, so the liquid remains fizzy.

When you open the bottle (without adding Mentos) the pressure drops, bubbles find it easier to form and some will trickle to the surface. But water is a sticky molecule, and to form a bubble inside the liquid the gas has to overcome the stickiness and push the water molecules apart. Small bubbles therefore find it difficult to form in the first place.

Safety information

- Do not stand over the pop bottle once the Mentos have been added, or you will get covered in pop!
- If any pop does get in your or a child's eye, wash it out with warm water.

However, trapped within the rough surface of the Mentos are millions of tiny pockets of air. When the Mentos are submerged in the fizzy drink, these air pockets become tiny bubbles that then 'seed' the formation of large bubbles filled with CO₂ taken from the drink.

Because the Mentos sink to the bottom of the bottle, large numbers of bubbles, which take up large amounts of space, form underneath the liquid. This pushes everything upwards and out through the neck of the bottle. Since the neck is narrower than the body of the bottle, the liquid has to speed up as it passes through, which is what sends it shooting up into the air.

Discussion

- Does the temperature of the fizzy pop make a difference to the reaction?
- What is a molecule?
- What is surface tension?
- In what other ways can you make the gas in the fizzy pop escape?

Just drop something into a glass of fizzy pop and notice how bubbles immediately form on the surface of the object. For example, adding salt to fizzy pop causes it to foam up because thousands of little bubbles form on the surface of each grain of salt.

Extensions

- Can you create the tallest eruption? Experiment with different fizzy pops and with different-flavoured Mentos.
- How many eruptions can you set off at one time? A Guinness World Record of 2433 simultaneous eruptions was set in August 2010 in Mexico City.

Links to real life

Volcanoes are powered by accumulations of molten rock, known as magma, which build up beneath the Earth's surface. The magma is under enormous pressure, which forces any gases that are present – including CO₂, sulphur dioxide and water vapour – to dissolve in liquid rock. If the pressure suddenly drops, for instance at the onset of an eruption, the

dissolved gases form bubbles thousands of times larger than the original volume of magma. This blasts molten rock, pumice, dust and ash for kilometres in all directions and blows the volcano itself to pieces.

Links to the Science Museum

Galleries:

- Challenge of Materials

Further information

- Bubble Trouble
- Gravity-Defying Water
- Alka-Seltzer Rocket
- Blow-Up Balloon