



SEGMENT INSTRUCTIONS

Germs Experiment!

Materials:

- 1 jug of cold water
- 1 white plate
- Black pepper
- 1 bowl of warm water
- 1 x tea towel
- Antibacterial soap

Instructions:

1. Pour the cold water onto the plate so that the water is nearly to the rim (edge) of the plate.
2. Shake pepper onto the plate so that it covers the water.
3. Place your finger in the water with the pepper and see that the pepper will stick to your finger.
4. Wash your hand in the bowl of warm water and dry your hand using the tea towel.
5. Now spread some of the soap on your finger so that it covers the end of your finger.
6. Place the finger covered in soap into the bowl and watch the pepper (the 'germs') move away from your finger!

What a great reminder to see how using soap can help get rid of germs. You could try different types of soap, or even hand sanitiser. Is there one type that works better than others?

What's happening?

Soap removes germs, but it doesn't kill them. The germs stick to the natural oil on our hands, and water alone will not remove them. So we need to use something that removes the oil and therefore the germs on our hand.

Soap likes water and soap likes oil. Soap is the perfect solution for sanitising our hands. When you wash your hands with soap, the soap molecules bind both the water molecules and oil molecules at the same time. Then when you rinse your hands with water, the soap carries the germs away.

Exploding Soft Drink Experiment!

Materials:

- Paper to make a funnel
- 1 x packet of mint Mentos (must be Mentos brand)
- Piece of card
- 1 x bottle of soft drink (diet cola works best)
- Safety glasses

Instructions:

1. Find open space where you can make a mess. Outside is a great location for this experiment, and check if you need adult supervision.
2. Put your safety glasses on and make sure your hair is tied back so you can see clearly.
3. Make a small funnel out of the piece of paper.
4. Place $\frac{1}{2}$ packet of Mentos in the funnel, and hold the piece of card underneath so that the Mentos don't fall out of the funnel.
5. Open the bottle of soft drink and place in a stable position on the ground. Put the lid to the side.
6. Place the piece of card and funnel (with Mentos) on top of the opening of the bottle, but don't let the card move.
7. On the count of 3, pull the card out and let the Mentos fall into the soft drink.
8. Move out of the way and watch the explosion!

Depending on how large a soft drink bottle you used, you may be able to try this experiment again with the remaining Mentos.

You might like to test this on different brands of soft drink – which one worked best for you? Does this experiment work as well when the soft drink has been opened for a few days? You might like to test other items in the soda – maybe a piece of uncooked pasta, a sultana, or some salt (hint: larger granules are better).

What's happening?

It's not the ingredients of the soft drink that are causing the reaction. It's the carbon dioxide (CO_2) which makes the soda bubbly. This is invisible until we open the soft drink bottle for the first time, or shake up the bottle. The carbon dioxide is pumped into the bottles at the bottling factory using lots of pressure. When you shake the bottle up, some of the carbon dioxide is released from the drink and clings to the side of the bottle (you can see this as bubbles). When you open the bottle, the bubbles quickly rise to the surface of the drink, and this is why sometimes the liquid sprays out of the top because the bubbles are rising so quickly.

The Mentos provide additional surface area for the bubbles to accumulate on when the soft drink is disturbed, and then quickly rise to the surface of the liquid. Because of the weight of the Mentos, they sink to the bottom of the bottle. This means that the bubbles accumulate at the bottom of the bottle initially, but then want to rise up to the top of the liquid as quickly as possible. In rising, they push up the soft drink as well – causing the explosion that we see.

