

Acids and alkalis



Read through the BBC Bitesize revision notes on Acids and Alkalis at [this link](https://www.bbc.co.uk/bitesize/guides/zf73382/revision/1).

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Use this knowledge and the wordbox below to fill in the missing words from each of the sentences. Use each word once.

Wordbox		
acid	green	salt
acid	hydrochloric	salt
acid	increase	salts
alkali	names	seven
alkali	neutralisation	universal indicator
calcium sulfate	neutralised	water
decrease	red	

- When an acid and an **ALKALI** react together it is called a **NEUTRALISATION** reaction.
- When an **ACID** is neutralised, it's pH will **INCREASE** towards **SEVEN**.
- This could be shown by **UNIVERSAL INDICATOR** changing from **RED** to **GREEN**.
- When an alkali is **NEUTRALISED**, it's pH will **DECREASE** towards 7.
- When an **ACID** and an **ALKALI** react together, two products will form. These are a **SALT** and **WATER**.
- The name of the **SALT** produced depends on the **NAMES** of the acid and alkali.
- HYDROCHLORIC** acid will produce **SALTS** whose names end in "chloride".
- The salt produced when sulfuric **ACID** and calcium hydroxide react together will be called **CALCIUM SULFATE**.

Acid Rain



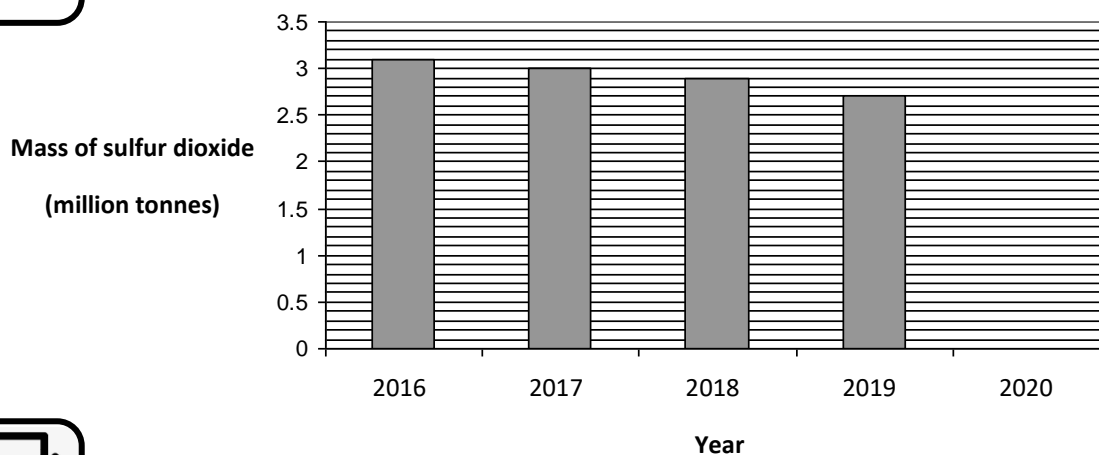
[What does acid rain do to the body? \(YouTube\)](https://www.youtube.com/watch?v=IIXZGJ4QF9E)

URL: <https://www.youtube.com/watch?v=IIXZGJ4QF9E> (5 mins 12s)



Sulfur dioxide (SO₂) is identified in the video as one of the main causes of acid rain.

The bar graph shows the mass of sulfur dioxide in millions of tonnes that is released into the atmosphere from an industrial city over a four year period.



- a) In which year was 3.0 million tonnes of sulfur dioxide released into the atmosphere?

2017

- b) Give two damaging effects of acid rain.

Kills plants, kills wildlife, destroys habitats, erodes limestone, speeds corrosion/rusting of metal, kills fish, increases aluminium in water. (any two)

- c) If the trend continued, predict the amount of sulfur dioxide released into the atmosphere from this industrial city in 2020

2.5 million tonnes

- d) Scientists predict that the coronavirus may have a beneficial effect on acid rain levels. Give two reasons why this might be case.

People are staying at home, so there are fewer cars on roads. Factories are closed, Businesses are closed, so less pollutant gases are being released into the atmosphere

- e) Produce a colourful poster or information leaflet about the causes of acid rain and the harmful effects it has on the environment.

If you want, you can send a photo of your poster to Mr McCranor (pmccranor@cumbernaulkdac.n-lanark.sch.uk) and we can show them on the website. Please include your name and science class.

Problem Solving/Data handling

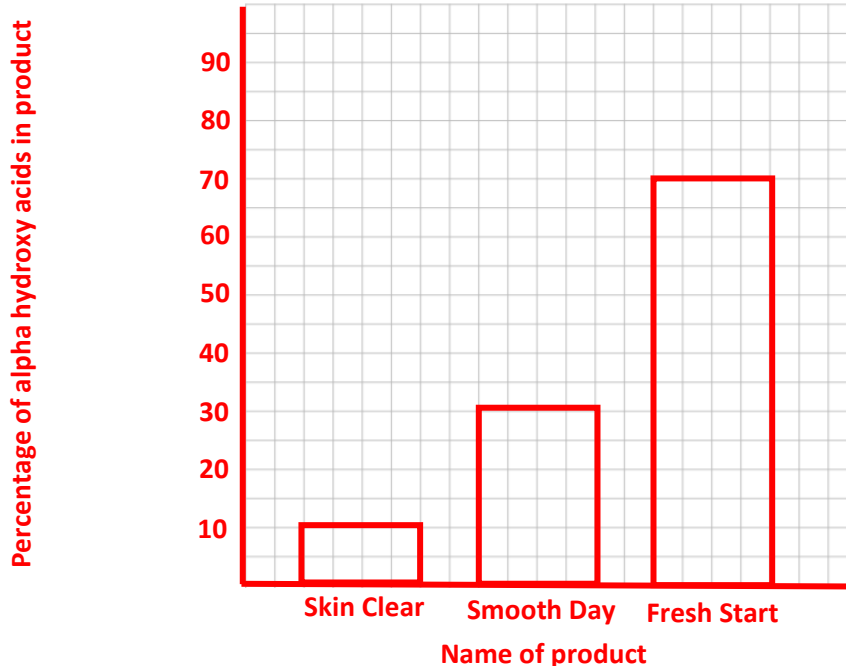


Alpha hydroxy acids are used in the cosmetics industry and are claimed to reduce wrinkles and other visible signs of aging. Cosmetic products contain different percentages of alpha hydroxy acids depending on their use.

Name of product	Use	Percentage of alpha hydroxy acids in product
Skin Clear	Facial scrub	10
Smooth Day	Chemical peels	30
Fresh Start	Treating acne scars	70



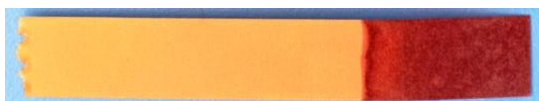
- Suggest a pH value for alpha hydroxy acids.
Any pH value less than 7 could be an acid.
- Draw a graph showing the name of each product with the percentage of alpha hydroxy acids in the product.



- A student tested the three cosmetic products from the table with pH paper. Their results are shown below. Fill in the name of each cosmetic product next to the pH paper that it was tested with.



Skin Clear



Fresh Start



Smooth Day

Practical Experiment



This is an interesting experiment that you can try in the house to see neutralisation in action.

You will need: 1 large glass or empty glass jar, 1 egg, vinegar

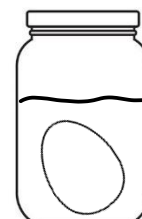
Vinegar that you buy from the supermarket is a solution that is about 96% water and 4% ethanoic acid. Eggshells are made up of calcium carbonate. This means that they will react together!

Remember: Acid + Metal Carbonate → Salt + Water + Carbon dioxide



Carefully place the egg into your jar or glass. Mugs work too, but it's harder to see what is going on. I recommend an empty jar so nobody complains about the smell! Pour vinegar into the glass so that the egg is fully submerged. What do you see?

You should see tiny bubbles forming all over the surface of the egg. These are bubbles of carbon dioxide gas, produced by the neutralisation reaction between the acid (vinegar) and the metal carbonate (eggshell).



Leave the egg for a full 24 hours. Does it look any different?

Eventually, there will be no more bubbles once the eggshell has reacted completely. The egg is still contained by a membrane, but it is not as rigid as it was with a shell. If you want, pour the vinegar down the drain safely and you can pick up the egg. How does it feel?

Your egg will feel a bit rubbery, and like a bouncy ball. If you're feeling brave, drop it into a flat-bottomed sink (like your kitchen sink) from a few centimetres height. It should bounce! How high can you drop it from? I recommend only trying this in the sink, as eventually there will be a cleaning up job to do!

Taking it further: Why not try your experiment (or eggsperiment) with some other solutions? Repeat all the steps with three other eggs, placing one in water, one in coke and one in orange juice. How do they compare? Remember to leave each egg in the solution for the same length of time.



Write up: Write an experimental report of your experiment. You should include an Aim, Method, Observations and Conclusion. You could do this in your jotter or as a poster.

If you want, you can send any photos of your experiment or write up to Mr McCranor (pmccranor@cumbernauldac.n-lanark.sch.uk) and we can show them on the website. Please include your name and science class.