

5.7

Using pH and neutralisation

How Science Works

Did you wash yesterday? Clean your teeth? Make yourself a drink? Scientists make sure your water is bug-free. They check its pH too. After all, no one wants water so acidic that it dissolves the pipes...or so alkaline that it blisters their skin.

This canal is really important. Half a million people rely on it to bring them water from the River Severn. The water supply company tests the canal water in four places along the canal. It uses pH meters to measure the pH. The pH meters are linked to a computer system. A sudden pH change shows there might be a problem. This sets off a central alarm, even in the middle of the night. Then it's down to the duty scientist to try to solve the problem – and fast!

Learn about

- Why water pH matters to humans and animals



1 A boat accidentally spills hydrochloric acid into the canal. What happens to the pH of the water?

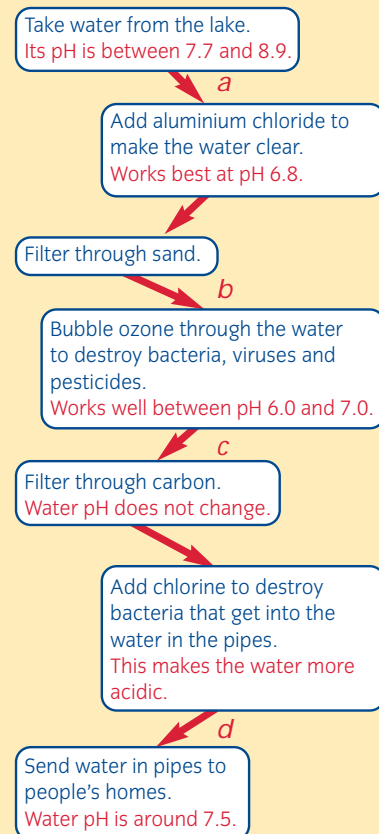
2 What type of chemical might the company add to the water to get the pH back to normal?

Testing the water

Biologists and chemists have found the best way of treating the canal water to make it safe to drink. The process involves several pH changes. The diagram on the right shows where these changes happen.

3 For each of the stages a to d, work out whether the water company adds an acid or an alkali or neither to the water.

Patric Bulmer plays a vital role in getting safe water to a million people. He's worked at the water company since getting a degree in geochemistry a few years ago.



◀ Patric and his colleague Vicky Richards testing the water.

Patric says, 'I love the variety in my job. It's hands-on, too. The other day I was clambering around in a water tower checking for bugs. Then a customer phoned to discuss the taste of water at his home. Later I made new dipping rods to get water samples from the lakes. The next day I was discussing climate change – and what we can do about it – with other scientists in London.'



pH for life

Water companies are not the only organisations that care about water pH. Environment and conservation organisations do too. Chemists have collected data about lake pH. Biologists have discovered the water pH at which different animals and plants survive.

Name of lake	pH of lake water in			
	1960	1970	1990	2001
Llyn Llaghi, Wales	–	–	5.0	6.0
Lake Gårdsjön, Sweden	6.0	4.5	–	–

- 4 a What was the pH of Lake Gårdsjön in 1960?
 b What happened to the acidity of Lake Gårdsjön between 1960 and 1970?
 c Name two animals that might have lived in Lake Gårdsjön in 1960.

Animal or plant	Water pH the animal or plant can live in							
	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5
Trout			✓	✓	✓	✓	✓	✓
Salmon				✓	✓	✓	✓	✓
Eel					✓	✓	✓	✓
Snails				✓	✓	✓	✓	✓
Mayfly					✓	✓	✓	✓

- d Name one animal that might have lived in Lake Gårdsjön in 1970.
 e A biologist found lots of snails in Lake Gårdsjön in 2007. What might have happened to the lake's pH to make this possible?
 5 a A biologist found no mayflies in Llyn Llaghi in 1990. Suggest one possible reason for this.
 b The biologist looked for mayflies in Llyn Llaghi in 2001. Do you think she found any? Give a reason for your answer.

Get this

- Water companies monitor the pH of water sources and treat drinking water.
- The pH of water affects the animals and plants that can live in it.