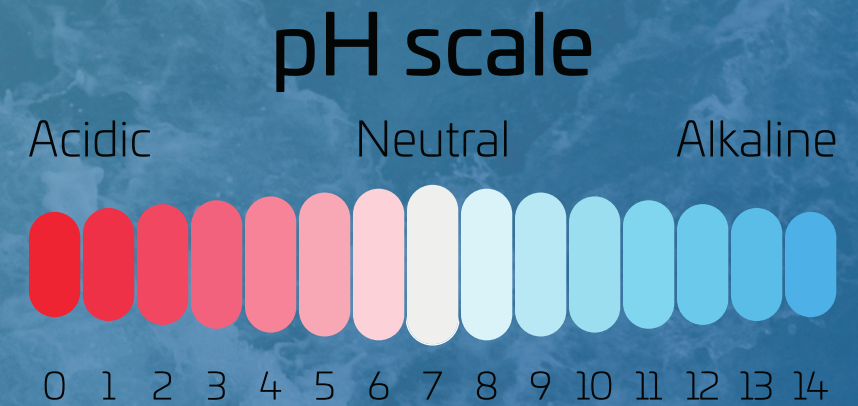


# DEMONSTRATING OCEAN ACIDIFICATION

Here is an easy demonstration that can be done within the classroom to demonstrate the principles of ocean acidification.

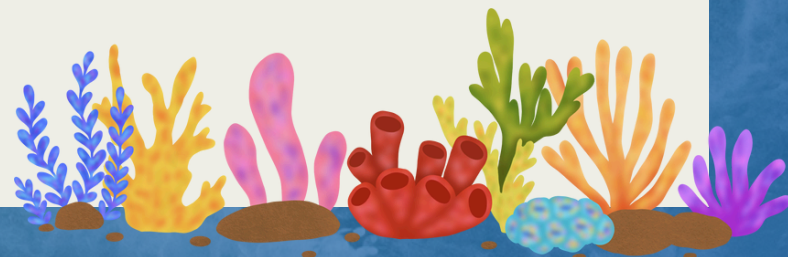
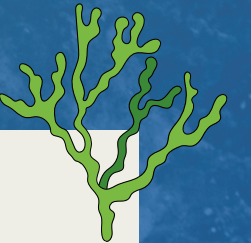


## YOU WILL NEED:

- 10ml syringes
- You can use any indicator that will give a noticeable change in colour as acidity increases, but universal indicator gives the best effect
- Bottle of sparkling water
- Jug of tap water
- Cups/small beakers
- White A4 paper: Or if you have them, white spotting tiles
- Vinyl gloves
- Universal Indicator Scale Sheet
- Pipette or dropper
- Safety specs/goggles

## SETTING UP:

- Set up your station with the following:
- A small beaker or glass of tap water labelled tap water
  - 2 small beakers or glasses of sparkling water labelled fizzy water
  - A few 10ml syringes
  - A pair of vinyl gloves
  - A small amount of universal indicator in a container
  - A pipette
  - A set of safety specs/goggles
  - Spotting tile/white paper
  - Some paper towel
  - Universal indicator scale sheet



## STEP 1

Show the audience the cup of tap water. Put on the goggles and explain that you have a special liquid that will change colour to tell you if something is an acid or an alkali. Show the scale and explain that acids and alkalis are corrosive – they eat away at materials. Explain that the further along the scale you go, the more acid or alkali a substance is.



## STEP 2

Ask those watching to put on the safety specs. Put on the vinyl gloves and safety specs and add a few drops of universal indicator to the tap water and ask the audience to use the scale to tell you whether it is an acid, alkali or neutral. It should be more or less neutral.

## STEP 3

Repeat this process with one of the beakers of fizzy water – it will be acidic (should be about a 3 on the scale). Explain that this is because carbon dioxide is dissolved in the water at high pressure, and is released as bubbles of carbon dioxide – that is what makes fizzy drinks fizzy. Carbon dioxide dissolved in water forms an acid called carbonic acid – and that is why the universal indicator has turned orange-red.

## REPEAT X10

Repeat this process 10 times and explain that each time you do it, you are removing more carbon dioxide from the syringe.

## STEP 6

Ask the audience to compare the colour of the original fizzy water, and the water you have de-gassed in the syringe. You can make this more clear by depositing a few drops of each on spotting tiles or white paper. The water in the syringe should now be almost neutral – by removing the carbon dioxide from the water, you have made it less acidic.



## STEP 5

Now tell the audience that you are going to repeat this experiment, but with the fizzy water with indicator in. Pull about 2ml of water into the syringe, and make sure that there is no additional air trapped. Place your finger securely over the end, making sure it is pointed away from the audience. Rapidly pull the plunger down and then release your finger from the end to let the carbon dioxide escape.

## STEP 4

Give the audience a syringe and ask them to pull 2ml of fizzy water (with no indicator in) into it. Get them to seal one end off with their thumb or finger and pull the plunger down – ask them what they can see. They should be able to see that the number of bubbles increases a lot – this means that more of the carbon dioxide is coming out of the water. When they take their finger off the end, the bubbling will stop and the CO<sub>2</sub> has been able to escape.

