

Ocean Acidification

Setting up the experiments – teacher notes

Some advance preparation is required for the ocean acidification experiments for Lesson 3.

The equipment required per group is as follows:

- Sea water or water and salt
- Litmus paper or pH meter
- Sea shells or egg shells
- Sea shells that have been soaked in vinegar solution for 48 hours
- Beakers
- Straws
- White vinegar
- Stopwatch
- Measuring jug
- Tablespoon
- Heavy books

The role of each piece of equipment is explained in the worksheets that accompany this lesson. These worksheets give instructions for carrying out two experiments, the first to investigate the effect of carbon dioxide on the acidity of water, and the second to investigate the effect of water acidity on the shells of sea creatures.

In the lesson, students are encouraged to design their own experiment to investigate these two processes without the use of the worksheets. However, for some groups it might be preferable to provide them.

If you are unable to collect seawater for the experiments, a similar concentration can be mixed using tap water and salt. The concentration of salt in seawater is approximately 3.5% or 35,000 ppm, which equates to 35g per litre. One level tablespoon of salt is approximately 18g. You can either mix the water in advance, or ask the students to do it as part of the experiment.

Something that will need to be done in advance is the soaking of sea shells in vinegar solution for the experiment to investigate the effect of water acidity on the shells of sea creatures. This can either be done by the teacher or by the students in a previous lesson. Shells can be soaked in pure white vinegar, a 50:50 mix of vinegar and water, or a mixture which recreates the possible pH of seawater affected by ocean acidification (between pH 7.0 and 7.5).

Ideally, thin sea shells such as slipper limpets or mussels would be used, as these have the potential to show the greatest effect. Alternatively, egg shells can be used. They should be soaked for between 24 and 48 hours.