



Experiment 1:

Investigating the effect of carbon dioxide on the acidity of water

Your task is to investigate how carbon dioxide (CO₂) can affect the acidity of seawater. This will give you an idea of whether increasing CO₂ emissions are likely to result in ocean acidification.

Equipment list:

- Salt
- Water
- 2 cups
- 1 lid
- 2 straws
- pH meter
- Measuring jug
- Tablespoon
- Stopwatch
- Where might we get a reliable and free source of CO₂...?

Instructions

1. The concentration of salt in seawater is approximately 3.5% (or 35,000 ppm), which equates to 35 grams per litre. Mix two cups of seawater using these proportions.
(Tip: 1 level tablespoon of salt is approximately 18 grams)
2. Use the pH meter to record the pH of the water in the first cup. Write this value into the first column of Table One on the back of this sheet.
3. Choose one person from your group who will have the task of adding CO₂ to the water. Their job is to blow gently through a straw into the water for two minutes. You will measure the pH of the water every 30 seconds during this process and record your findings in Table One. Don't worry, they are allowed to breathe! They should take small breaths when they need to.
(WARNING: Remind them to blow, not suck! The water will taste revolting!)
4. Repeat the experiment but this time cover the cup with a lid and insert the straw into the opening. Record your findings in Table Two.
5. Answer the questions on the back of this sheet and be prepared to share your findings with the rest of the group.

Results

Table One: results (no lid)

Time (seconds)	0	30	60	90	120
pH					

Table Two: results (with lid)

Time (seconds)	0	30	60	90	120
pH					

Questions

1. Your breath contains CO₂ gas in it. After blowing through the straw into the samples, describe what happened to the pH of the water.

2. Using your knowledge of ocean acidification, can you explain what happened here?

3. Was there any difference in the pH change of the two samples of water, one without a lid and one with? Why do you think this was?

4. What have you learnt about the process of ocean acidification from this experiment?

5. What do you think are the limitations of this experiment?

6. How could this experiment be improved?
