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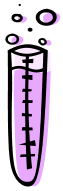

Experiment 2: Investigating the effect of acidity on the shells of sea creatures

Your task is to investigate how increased acidity in seawater can affect the calcium carbonate shells of sea creatures. This will give you an idea of the possible implications of ocean acidification for marine organisms and ecosystems.

Equipment list:

- Salt
- Water
- Vinegar
- 2 cups
- Measuring jug
- Tablespoon
- 1 soaked shell
- 3 unsoaked shells
- Stopwatch
- Heavy books

There are two parts to this experiment. The first looks at what happens to a calcium carbonate shell when it is placed in an acidic liquid. The second compares the strength of two shells, one of which has been soaked in vinegar (a strong acid) for two days.

Instructions – part one

1. The concentration of salt in seawater is approximately 3.5%, which equates to 35 grams per litre. Mix one cup of seawater using these proportions.
   (Tip: 1 level tablespoon of salt is approximately 18 grams)
   Now add the same quantity of vinegar to your cup so that you have a ratio of 1:1 water and vinegar.
   In the other cup, pour a measure of vinegar on its own.

2. Place one unsoaked shell in each cup and start the stopwatch. Observe what happens and record it in Table One on the back of this sheet.

Instructions – part two

1. Take two shells, one that has been soaked in vinegar solution for two days and one that has not. Compare the difference between the two shells visually and write your observations in Table Two on the back of this sheet.

2. Lay the shells between two sheets of paper and pile books on the top of each shell. Record what happens in Table Two.

3. Answer the questions on this part of the experiment and be prepared to share your findings with the rest of the group.

Results

Table One: results (part one)

Shell one: vinegar solution	
Time	Observation
Shell two: pure vinegar	
Time	Observation

Table Two: results (part two)

Shell three (soaked)		Shell four (unsoaked)	
Visual observations of the difference between the two shells			
Observations about the strength of the two shells			
Time taken to break	Number of books	Time taken to break	Number of books

Questions

1. What happened when you placed the shells in vinegar / vinegar solution? Why do you think you were asked to do both?

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   _____

   _____

2. You may have seen some bubbles generated around the shells. What do you think these bubbles were composed of?

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3. What had happened to the shell that had been soaked in vinegar for two days?

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4. What have you learnt from this experiment about the effect of ocean acidification on sea creatures?

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

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6. How could this experiment be improved?

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