

# Section 1: Ocean Acidification

## LESSON 2: RESEARCH IN ACTION

All lesson resources can be found at: [encounteredu.com/teachers/lessons/frozen-oceans-geography-14-16-lesson-2](https://encounteredu.com/teachers/lessons/frozen-oceans-geography-14-16-lesson-2)

### Summary

The Arctic Ocean is known as a 'sentinel system'. This is because ocean acidification is happening more rapidly in these cold waters. Pupils will learn about the research that is currently being undertaken in this remote region.

### Preparation

- Familiarise yourself with relevant multimedia content found online at:  
[encounteredu.com/teachers/lessons/frozen-oceans-geography-14-16-lesson-2](https://encounteredu.com/teachers/lessons/frozen-oceans-geography-14-16-lesson-2)
- Print out enough copies of:
  - Subject update – Ocean acidification
  - Student Sheet 2a – Dissolving sea shells in acid
- There are a range of options for pupils to communicate their work, all of which were methods used by the scientists. Print out enough copies of (if using):
  - Student Sheet 2b – Scientist tweet sheet
  - Student Sheet 2c – Blog post
  - Student Sheet 2d – Storyboard template

### Notes

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Aims / Objectives	Activities	Resources	Outcomes
<p>STARTER:</p> <p>WHERE IS OCEAN ACIDIFICATION HAPPENING?</p>	<p>Show pupils the difference in sea-surface pH map</p> <p>Ask pupils to identify the areas where the change in ocean pH is fastest</p> <p>Why might this be the case?</p> <p>Show pupils the sea-surface temperature map</p> <p>Ask pupils whether they can identify any links between pH and temperature</p>	<p>Multimedia:</p> <p>'Sea-surface temperature' diagram</p> <p>'Difference in sea-surface pH' diagram</p>	<p>Know that ocean acidification is happening at different rates in different places and understand some of the reasons for this</p>
THE SENTINEL SYSTEM	<p>Introduce the fact that the Arctic acts as a sentinel system for the rest of the planet's oceans. Changes are happening here fastest and can show what the possible impacts could be for the rest of the oceans</p> <p>Show the Channel 4 News video to introduce pupils to the work of the Catlin Arctic Survey</p>	<p>Multimedia:</p> <p>'Channel 4 News' video</p>	<p>Know why scientists are going to the Arctic to study ocean acidification</p>
HOW IS RESEARCH CONDUCTED IN THE ARCTIC?	<p>Show pupils the galleries that show what a day in the life of an Arctic scientist is like</p> <p>A practical demonstration can be used to show the principles behind Dr. Ceri Lewis' work</p>	<p>Multimedia:</p> <p>Gallery: Water sampling</p> <p>Gallery: Trawling for Copepods</p> <p>Gallery: Ice Base science</p> <p>Subject update – Ocean acidification (for background to the research)</p> <p>Student Sheet 2a – Dissolving sea shells in acid</p>	<p>Know what it would be like to be an Arctic scientist</p>
A DAY IN THE LIFE	<p>Pupils to create a presentation of a day in the life of an Arctic scientist</p>	<p>This can be created using:</p> <ul style="list-style-type: none"> <li>– A slideshow program</li> <li>– Through Twitter (use Student Sheet 2b)</li> <li>– As a blog post (use Student Sheet 2c)</li> <li>– A storyboard for a short video (use Student Sheet 2d)</li> </ul>	<p>Demonstrate understanding of the realities of remote field research</p>
PLENARY	<p>Scientists have to make a case to receive funding to enable them to conduct their work from research bodies such as NERC</p> <p>What ocean acidification research would pupils apply for?</p> <p>Do pupils think that ocean acidification should be a research priority?</p>	<p>Show the NERC site:</p> <p><a href="http://www.nerc.ac.uk">http://www.nerc.ac.uk</a></p>	<p>Understand that scientists have to make a case when they apply for funding</p>