

Section 1: Ocean Acidification

LESSON 3: DATA ANALYSIS

All lesson resources can be found at: encounteredu.com/teachers/lessons/frozen-oceans-geography-14-16-lesson-3

Summary

One of the most used data sets to show the trend in ocean acidification over the past 20 years is from the Hawaii Ocean Time-series. Pupils will use the real data from a series of research 'cruises' to analyse the information and identify trends. There are options to use ICT to examine the data set, as well as using print outs of graphs and data tables.

Preparation

All options

- Familiarise yourself with the data and download from Lesson resources: encounteredu.com/teachers/lessons/frozen-oceans-geography-14-16-lesson-3
- Print out enough copies of:
 - Subject Update – Hawaii Ocean Time-series

Option 1 – offline, with pupils required to draw their own graphs from a data table

- Print out enough copies of:
 - Student Sheet 3a - Ocean acidification data and question sheet
 - Student Sheet 3b - Ocean pH graph
 - Student Sheet 3c - Ocean carbon dioxide graph

Option 2 – offline, with pupils analysing a pre-prepared graph

- Print out enough copies of:
 - Student Sheet 3d - Ocean acidification graph and question sheet

Option 3 – online, with pupils creating graphs in MS Excel

- Book computer room
- Download data set from: encounteredu.com/teachers/lessons/frozen-oceans-geography-14-16-lesson-3
- Download slideshow to demonstrate MS Excel techniques: encounteredu.com/teachers/lessons/frozen-oceans-geography-14-16-lesson-3
- Print out enough copies of:
 - Student Sheet 3e - Ocean acidification Excel and question sheet

Notes

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Aims / Objectives	Activities	Resources	Outcomes
STARTER: WHY USE THIS DATA SET?	It has only been in the past few years that ocean acidification has been researched more. There are few data sets that show how carbon dioxide has affected the pH of the oceans over a period of time	Subject Update – Hawaii Ocean Time-series for background Show the location of the cruises on a map or using Google Earth (22°45'N, 158°00'W)	Understand that long-term data on ocean acidification is rare
DATA EXERCISE: OPTION 1	Using the annual mean data from the Hawaii Ocean Time-series, pupils: <ul style="list-style-type: none">- answer basic questions about data sets- draw graphs based on the data- interpret the graphs	Student Sheet 3a – Ocean acidification data and question sheet Student Sheet 3b – Ocean pH graph Student Sheet 3c – Ocean carbon dioxide graph	Understand the use of data in geographical enquiry Create a graph from a data set Interpret data and draw conclusions
DATA EXERCISE: OPTION 2	Using the annual mean graph from the Hawaii Ocean Time-series, pupils: <ul style="list-style-type: none">- answer basic questions about data sets- interpret the graphs	Student Sheet 3d – Ocean acidification graph and question sheet	Understand the use of data in geographical enquiry Interpret data and draw conclusions Draw a line of best-fit
DATA EXERCISE: OPTION 3	Using the annual mean data from the Hawaii Ocean Time-series, pupils: <ul style="list-style-type: none">- answer basic questions about data sets- draw graphs based on the data- interpret the graphs	Student Sheet 3e – Ocean acidification Excel and question sheet Spreadsheet – Ocean acidification data (student) Slideshow 3 – Using Excel to create graphs <i>The use of a computer room is needed for this option</i>	Understand the use of data in geographical enquiry Create a graph from a data set Interpret data and draw conclusions Use software to assist in the interpretation and communication of data