

# LESSON 4: DATA ANALYSIS (BIOLOGY)

All lesson resources can be found at: [encounteredu.com/teachers/lessons/frozen-oceans-science-14-16-lesson-4](https://encounteredu.com/teachers/lessons/frozen-oceans-science-14-16-lesson-4)

## Summary

The Catlin Arctic Survey scientists wanted to see what impact increased ocean acidification might have on a type of zooplankton, copepods. To do this, they trawled for copepods through a hole in the ice and placed them in experimental batches. These experimental batches were exposed to different levels of pH simulating both current and predicted scenarios. After 7 days, the batches were examined to see how many of the copepods had survived in each scenario and analyse the impact that future acidification might have on zooplankton, the foundation of the Arctic food web.

### Learning Objectives

- Present data using appropriate methods and carry out and represent mathematical analysis
- Interpret data, including identifying patterns and trends and use data to make inferences and draw conclusions
- Evaluate data critically, showing awareness of potential sources of random variations and systematic errors

### Preparation

- Familiarise yourself with the Copepod Survival Data in the spreadsheet available online in lesson resources
- Print out enough copies of:

Subject Update - Copepods into the future

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

- Print out enough copies of:
  - Student Sheet 4a - Copepod survival Adult data sheet
  - Student Sheet 4b - Copepod survival Nauplii data sheet

#### Option 2 – offline, with students analysing a prepared data table

- Print out enough copies of:
  - Student Sheet 4c - Copepod survival data analysis

#### Option 3 – online, with students creating graphs in MS Excel

- Book computer room or class laptops
- Download Copepod Survival Data Students for students and save to appropriate work area for students
- Download the Lesson 4 slideshow 'Using Excel to make calculations'
- Print out enough copies of:
  - Student Sheet 4d - Copepod survival Excel and question sheet

## Notes

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# LESSON PLAN

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Aims / Objectives	Activities	Resources	Outcomes
<p>STARTER:</p> <p>WHY STUDY COPEPODS?</p>	<p>Copepods are an integral part of the Arctic ecosystem. As primary consumers, they provide the building blocks for larger animals such as whales, seals and polar bears. Using the Fact Sheet and slideshow, put the data analysis into context.</p>	<p>Subject Update - Copepods into the future</p>	<p>Understand the context of the data analysis exercises and the importance of copepods to the Arctic ecosystem.</p>
<p>DATA EXERCISE: OPTION 1</p>	<p>Using the survival data from the Catlin Arctic Survey data, students:</p> <ul style="list-style-type: none"> <li>- perform basic calculations with the data</li> <li>- answer basic questions about the data</li> <li>- draw a graph based on the data</li> <li>- interpret the data and draw conclusions</li> </ul>	<p>Student Sheet 4a - Copepod survival Adult data sheet</p> <p>Student Sheet 4b - Copepod survival Nauplii data sheet</p>	<p>Understand the use of data in science investigation</p> <p>Create a graph from a data set</p> <p>Interpret data and draw conclusions</p>
<p>DATA EXERCISE: OPTION 2</p>	<p>Using the survival data from the Catlin Arctic Survey data, students:</p> <ul style="list-style-type: none"> <li>- answer basic questions about the data</li> <li>- interpret the data and draw conclusions</li> </ul>	<p>Student Sheet 4c - Copepod survival data analysis</p>	<p>Understand the use of data in science investigation</p> <p>Interpret data and draw conclusions</p>
<p>DATA EXERCISE: OPTION 3</p>	<p>Using the data from the Copepod Survival Data spreadsheet:</p> <ul style="list-style-type: none"> <li>- perform basic calculations with the data</li> <li>- create a graph based on the data</li> <li>- answer basic questions about the data</li> <li>- interpret the data and draw conclusions</li> </ul>	<p>Student Sheet 4d - Copepod survival Excel and question sheet</p> <p>Spreadsheet - Copepod survival data (student)</p> <p>Slideshow - Using Excel to make calculations</p>	<p>Understand the data in science investigation</p> <p>Perform basic calculations using Excel</p> <p>Create basic graphs using Excel</p> <p>Interpret data and draw conclusions</p>