

Information sheet



Satellites and sea water

Introduction

This lesson has been designed to support the UK Space Agency's Logo Lift Off competition, which is the search for a logo that will go on the first ever rockets to be launched from the UK in 2022. The competition also aims to help engage young people with STEAM subject matter, through the lens of space, satellites, and climate change. Students will need to show understanding of the role of small satellites in informing solutions to climate change in their entries to the Logo Lift Off competition.

In these activities children will:

1. Use satellite images to look at how climate change impacts the sea or ocean through presentation slides.
2. Complete a quick experiment about the effect of a change in sea temperature.
3. Optional: older or more able children will be able to also consider a change in ocean acidity and complete another experiment about it.

Preparation

This lesson is designed to be run in the classroom, but the experiments can also be done at home. Whoever is running it will need to familiarise yourself with the resources required (below) and ideally print out the necessary sheets.

Learning Outcomes

- I can use satellite images to identify different ocean temperatures
- I can understand the effect of temperature change on water and ice
- *Optional: I can understand the effect of acidity change on shells/things in the ocean*

Timings and setting

15-45 minute activity

Resources

1. Slides
2. Experiment Sheet(s)

Experiment 1

- Container
- Warm and cold water
- Ice cubes
- Thermometer
- Stopwatch
- Measuring jug

(Optional) Experiment 2

- 5 jars or cups
- Thin shells e.g. mussels or egg shells
- Salt
- White vinegar
- Water
- pH paper
- teaspoon

Curriculum links

England: Science, Geography

Scotland: Sciences, Technologies

Wales: Science and Technology

Northern Ireland: The World Around Us

Differentiation

If working with younger children (under 7) or a less-able group you could not complete the acidity experiment if these concepts might be too complex.

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Supporting information for presentation

Most of the information you need to talk through the activity slides is on the slides! Below are a few pieces of extra information, including some extension facts, to go with them.

Slide 4

If no internet connection is available, simply skip the video. If an internet connection is available: Discuss the video and what pupils have seen. The balloon with no water pops immediately. The balloon with water does not. Explain that this is because the water in the second balloon absorbs the heat from the flame, protecting the balloon.

Extension: Explain to pupils that water has a very high "heat capacity". This is why it can absorb so much heat. Different liquids can have different heat capacities.

Slide 5

The Earth's oceans are absorbing a great deal of the heat generated by climate change. The Earth's oceans are absorbing about 80 – 90% of the heat from global warming.

Slide 6

Extension: Ask why are sea temperatures hotter across the middle of the earth? (Answer: because of the equator, it's the hottest area of the earth)

Slide 7

Safety: Do not use boiling water for this experiment, pupils can handle warm but not hot water.

Remind children that icebergs are made of ice and surrounded by the ocean. Ask what they think the impact of sea temperature changing might have on icebergs.

Extension: Do the Iceberg experiment from the What can we see from space? Activity to explore this even more!