



WATER AND THE OCEANS

INTRODUCTION

The ocean covers 71 percent of the Earth's surface and contains 97 percent of the planet's water, yet more than 95 percent of the underwater world remains unexplored. The ocean and other bodies of water have essential functions in regulating the Earth's climate and weather. The ocean supports the life of nearly 50 percent of all species on Earth and helps sustain that life providing 20 percent of the animal protein and 5 percent of the total protein in the human diet¹.

With this activity kit teachers and learners can:

- Explore global issues related to ocean sustainability
- Investigate the threats to the planet's oceans
- Consider ways to reduce their own impact

IN THE CURRICULUM KS3

Activity 1 brings a global dimension to Geography by developing an understanding of the use of natural resources and how human processes influence and change landscapes, environments, and the climate

Understand how human and physical processes interact to influence, and change landscapes, environments and the climate; and how human activity relies on effective functioning of natural systems



GETTING STARTED:

Discuss: Why are the oceans important?

The oceans are incredibly important to all life on Earth. There are many different ways which we rely upon the oceans, some of which we are very aware of and some we probably know less about.

In groups, spend five minutes thinking of all the ways the oceans are important to people, and all the ways we use the oceans.

Discuss: These are just some of the ways the oceans are important

1. Transportation

The oceans are very important for transportation. More than 90% of trade between countries is carried by ships, enabling us to buy products produced right across the planet². Without ocean transportation trade would be very different as flying products around the world would not be cost effective.

2. Food

The oceans provide a substantial proportion of food consumed globally. More than 3.5 billion people rely on the oceans for their primary source of food³. People eat an average of 17kg per year of fish⁴.



GETTING STARTED CONT'D

3. Leisure

The oceans provide a great number of leisure activities for people, such as visiting the beach, swimming, diving, sailing and other water sports. The oceans provide many opportunities for tourism.

4. Waste disposal

The oceans have long been used as a place to deposit waste. At times, in some places, this has actually included untreated waste and sewage flowing directly into the oceans. Some ships dump their waste, and drains from streets flow directly into the oceans, untreated, and are a major contributor to carrying litter and plastics out to sea.

5. Producing oxygen

The oceans produce more than half of the oxygen in the atmosphere, and absorb the most carbon from it⁵. The small sea plants in the ocean called *phytoplankton* create oxygen which is released into the atmosphere. This is incredibly important for all life on the planet.

6. Climate regulation

The oceans also have a crucial role in regulating the climate of the planet. The ocean acts like a big solar panel, absorbing the heat from the sun during the day and retaining it during the night⁶. Weather patterns are driven by the ocean currents, moving warmer air around the planet, and the evaporation from the surface that leads to rain.



Without the currents moving the heat around the planet the extremes of temperature from the poles to the equator would make far less of the planet habitable.

7. Energy

The oceans and seas have long had a role to play in creating energy, mainly by providing the huge quantities of water required to cool power plants down as they create electricity, which is why many are by the coast. The UK also generates 4% of its electricity by wave power⁷.

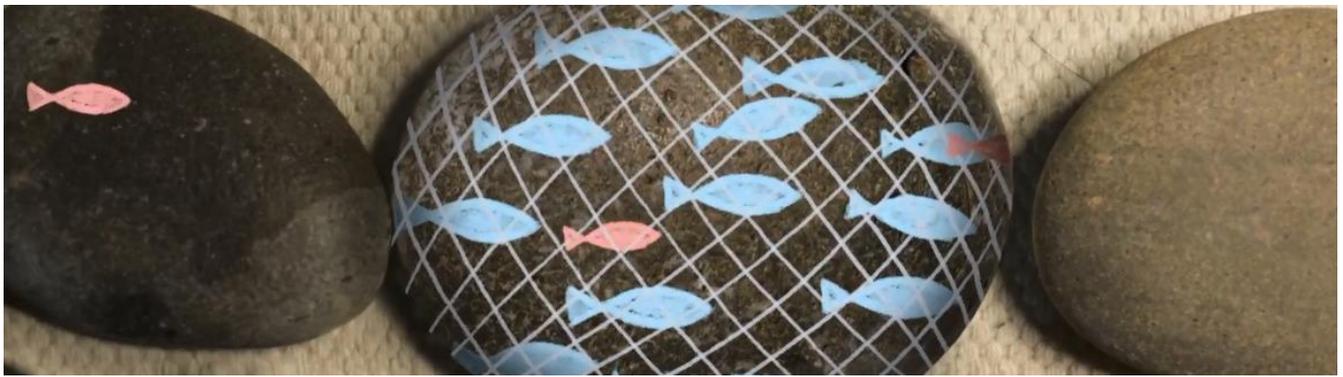
GETTING CRITICAL

A drop in the ocean

The average depth of the entire ocean is about 3.5km, with the deepest known point being almost 11km deep⁸. The oceans are vast, and we humans have long treated the oceans as if they could absorb everything we throw at, or in, them. In the past few decades scientists have been trying to help people understand that this is not the case.

It has long been known that the oceans absorb the carbon dioxide from the air and this can make the water more acidic, but it was a widely held view that the vastness of the oceans meant it was a very minor problem. This is now known not to be the case. Similarly, ships have often dumped their waste, plus much sewage and other waste from the land ends up on the sea with the view that it could be absorbed, but there are now some projections which suggest there will be more plastics than fish in the sea by 2050⁹.

Our oceans are under threat.



ACTIVITY ONE: CAUSE, EFFECT, RESPONSE

In groups, use the list of the different things that make the oceans important to us above to think about what might threaten how we use the oceans. Add to the list if there are other things you can think of that make the ocean important to us, and what might threaten those activities.

Using the list you have just created, sort the important uses of the oceans and the threats into causes and effects. Then next to each of these, start to plan out some responses – what might humans do to address these threats?

Take a look at the **WWF website** which discusses in more detail the biggest threats to our oceans http://wwf.panda.org/about_our_earth/blue_planet/problems/

To explore in more depth, **Blue Planet 2** is an excellent BBC series focussing on the oceans, with the final episode focussing on plastic pollution and the effect on ocean life. Use this episode to find out more about the effect of plastics on the oceans (available on DVD).

Watch the film 'My Dad the Fisherman' from the **Marine Stewardship Council (MSC)** and use the teaching resources associated to explore the issues to do with fishing and sustainability.

To explore ocean acidification, watch the excellent short animated film on the **Smithsonian Ocean Portal** <http://ocean.si.edu/ocean-acidification> and explore the case study about the Caribbean.

The Sustainable Development Goals are a set of 17 goals set out by the United Nations for all countries of the world to use to develop their policies to work towards improving the lives of people and looking after the planet.



Sustainable development goal 14: life below water

This goal aims to conserve and sustainably use the oceans, seas and marine resources for sustainable development. This includes managing coastal ecosystems, preventing pollution and ensuring fishing levels are sustainable. By working together towards this goal countries are committed to making progress on the health of the oceans.

ACTIVITY TWO: THE OCEAN OF THE FUTURE

Use the article 'How the World's oceans could be running out of fish'¹⁰ and the information explored so far in the film and website resources. In small groups, think about what the resources suggest about the future of the oceans by 2025 and 2050. What do they predict will be the case with fish, plastics, climate and general ocean health?

Using the information you have, work on different scenarios. How likely is it that these situations will be the reality?

- What do you think is the **probable** future given what you have learnt?
- What is a **possible** future, given what you know about how things could be improved?
- What is the **preferable** future? How can we make this come about? In your group think about different solutions to some of the problems. These may be scientific solutions, such as developing new materials, new methods, or may be about changing people's actions. How do these things happen and who needs to make them happen?

RESOURCES



Sign **Greenpeace** oceans sanctuary petition and learn how to become an oceans advocate <http://bit.ly/1qwwCBx>

Learn how **National Geographic** are trying to protect 20 of the ocean's wildest places by 2020 through their Pristine Seas project <http://bit.ly/2s8HhZS>



National Geographic also offers simple practical steps on how to save our oceans <http://on.natgeo.com/2kDbudZ>



Marine Stewardship Council has a website with activities and resources for teaching about ocean sustainability and how to look for the MSC logo in supermarkets <http://bit.ly/2DgyoDm>



'**My Dad the Fisherman**' is a beautifully illustrated short film about a girl's Dad and their seafaring way of life, with supporting teaching resources <http://bit.ly/2FFntRa>

One World One Ocean offers ideas for ways to save the oceans and how to spread the word around ocean conservation <http://bit.ly/1jaZLJC>

New **UN international Conservation Treaty** to protect the oceans <http://bit.ly/2pub3az>



The Marine Conservation Society has lots of information and campaigns about protecting the oceans, including a single use plastic challenge! <http://bit.ly/2FBEj3r>

KidzWorld introduces the Pacific Ocean's Plastic Island aka Great Pacific Garbage Patch, and its long term impact on the environment <http://bit.ly/2DhW89j>



References

- 1 <http://www.theworldsoceans.com/>
- 2 http://savethesea.org/STS%20ocean_facts.htm
- 3 http://savethesea.org/STS%20ocean_facts.htm
- 4 <http://www.bbc.com/future/story/20120920-are-we-running-out-of-fish>
- 5 <http://www.protectplanetocean.org/collections/introduction/introbox/oceans/introduction-item.html>
- 6 <http://oceanexplorer.noaa.gov/facts/climate.html>
- 7 <https://www.gov.uk/guidance/wave-and-tidal-energy-part-of-the-uks-energy-mix>
- 8 <http://www.independent.co.uk/environment/10-things-you-never-knew-about-the-oceans-deepest-places-a6907316.html>
9. <https://www.theguardian.com/business/2016/jan/19/more-plastic-than-fish-in-the-sea-by-2050-warns-ellen-macarthur>
10. <http://www.bbc.com/future/story/20120920-are-we-running-out-of-fish>



This Activity Kit is brought to you by Think Global www.think-global.org.uk. Visit our teaching website: www.globaldimension.org.uk which supports teachers to bring a global dimension to their classroom.

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