

Background Science

In this activity you will explore how the ocean has a major influence on our daily lives, even for those of us who don't live by the sea. Gaining an understanding of the ocean's influence on you and your influence on the ocean can be seen as an improvement in your 'Ocean Literacy' – a concept that was developed in America in the early 2000s. This could be appreciating how your rubbish might end up in the ocean and realising that half of the oxygen we breathe comes from the ocean!

There are 7 core principles to Ocean Literacy:

- Earth has one big ocean with many features.
- The ocean and life in the ocean shape the features of Earth.
- The ocean is a major influence on weather and climate.
- The ocean makes Earth habitable.
- The ocean supports a great diversity of life and ecosystems.
- The ocean and humans are inextricably linked.
- The ocean is largely unexplored.

Some of these principles are highlighted by examining a series of props or information cards, which explain the importance of the ocean across a range of areas from food and medicines to climate regulation and cultural importance. Once you start thinking about it, it seems remarkable that we call our planet 'Earth' given how important the ocean is and even more so when you recall that around 71% of the surface is covered by it!

Useful Web Links

ATLAS

The below link is for the ATLAS website. The education tab lists the entire suite of resources developed by Dynamic Earth based on ATLAS research. Topics covered include ocean importance, working at sea, pressure in the deep, marine biodiversity, hydrothermal vents, Remotely Operated Vehicles (ROVs), and threats to coral reefs.

<https://www.eu-atlas.org/>

TEDEd: How do Ocean Currents Work?

Follow the link below for a great 4 minute video resource by Jennifer Verduin of TEDEd explaining ocean circulation and its importance. This would be a great resource to use in the classroom to complement the content of the activity and enhance the learning.

<https://ed.ted.com/lessons/how-do-ocean-currents-work-jennifer-verduin>

BBC

The link is from several years ago, but nicely explains in simple language why the ocean is such a great place for scientists to search for life-saving medicines and how this resource may be under threat.

<https://www.bbc.co.uk/news/science-environment-27295159>



Curriculum Links

Planet Earth: Processes of the planet

I can apply my knowledge of how water changes state to help me understand the processes involved in the water cycle in nature over time.

SCN 2-05a

By contributing to experiments and investigations, I can develop my understanding of models of matter and can apply this to changes of state and the energy involved as they occur in nature.

SCN 3-05a

Materials: Earth's materials

Having explored the substances that make up Earth's surface, I can compare some of their characteristics and uses.

SCN 2-17a

People, place and environment

Having explored the ways journeys can be made, I can consider the advantages and disadvantages of different forms of transport, discussing their impact on the environment.

SOC 2-09a

Plus links with Higher Geography: Physical Environments: Atmosphere and Higher Environmental Science: Earth's Resources—Hydrosphere

Kit List

We have provided photos on the following pages that can be printed out and used to prompt discussion by the learners. Alternatively, gather props which represent each of the different cards (for example we used a plastic pet syringe for 'medicines' and a cushion with a 'breathe in the ocean' slogan for the oxygen). Hand out to individuals or groups and lead discussions on the items.

Photo prompt: Energy

A lot of the energy which we use in our daily lives comes from the ocean. New technologies such as wave or tidal power use the energy of the sea itself, while oil and gas are taken out from under the sea-floor. Some of the oil was originally tiny marine animals and phytoplankton which sank to the sea floor after they died and slowly turned into oil over millions of years.

Photo by Shaun Dakin on Unsplash



Photo prompt: Food

Every day, billions of people around the world eat fish as part of their meal. Are you one of them? How much of your food comes from the sea?

Photo by Dana Tentis on Pexels



Photo prompt: Recreation & Wellbeing

Experiencing the sea, shoreline or ocean has benefits for health and wellbeing. Many people associate the sea with a sense of calm. For others, it is a fun place to play or a place for sport. For island or coastal nations the ocean plays a major role in culture and heritage as well.

Photo by Piet Bastine on Unsplash



Photo prompt: Medicine

Life in the sea is specially adapted to different conditions. Scientists think that some of these adaptations can help us make new medicines including anti-cancer drugs. An anti-leukemia drug derived from a sponge was the first marine-drug approved for cancer treatment in 1969.

Photo by freestocks.org on Unsplash



Photo prompt: Ocean Currents

The ocean transports heat across the planet. Warm water moves from the Equator to the poles in huge currents, a bit like a stream of water in the ocean. This helps to keep the planet at a good temperature and also has a big effect on our weather.

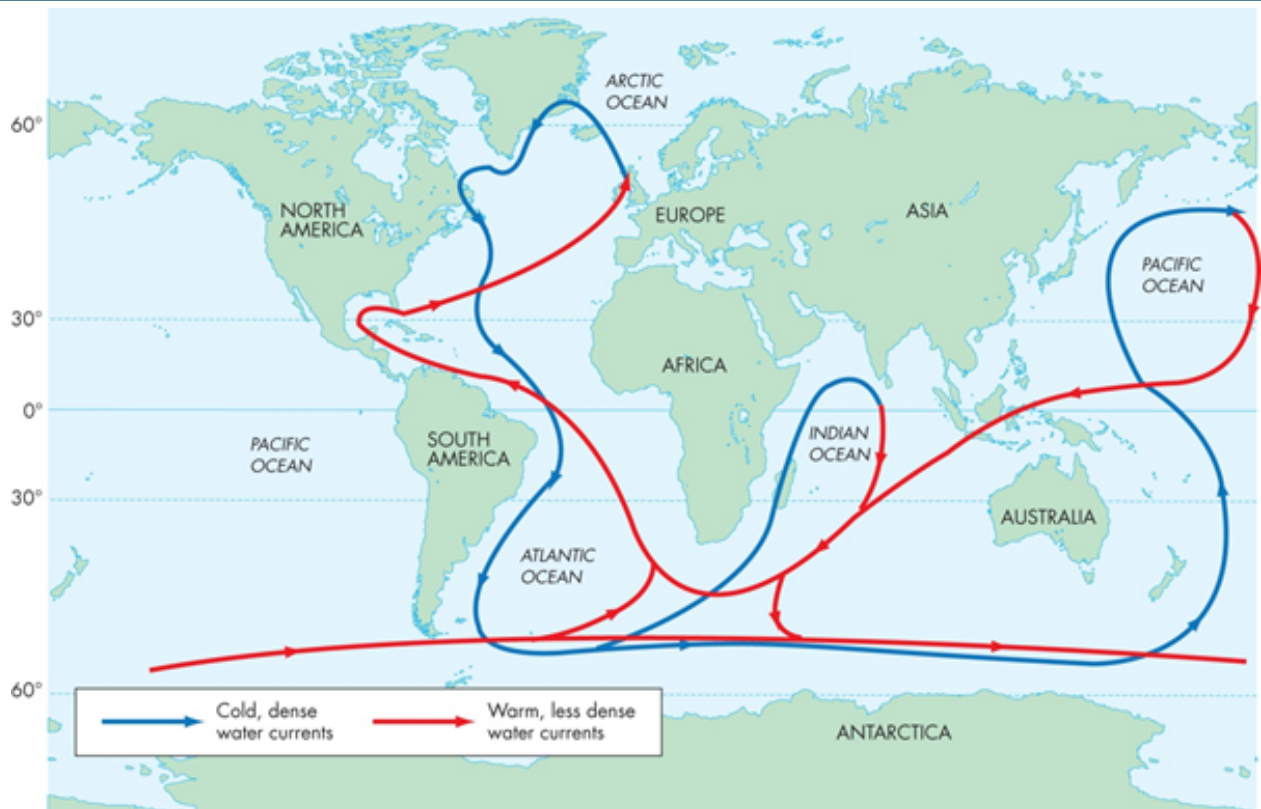


Photo prompt: Phytoplankton

Just like plants on land take in CO₂ and give out oxygen, so do things that live in the sea. There are tiny creatures called phytoplankton which actually produce half of the oxygen that we breathe in! They're also very important as lots of other creatures in the ocean eat them – they're the base of a lot of marine food chains.



Photo prompt: Travel & Research

Have you ever seen a picture of a ship with huge steel boxes called 'shipping containers'? Over 90% of things bought and sold around the world are moved by ships, including cars! People still travel by sea as well to get to other countries or to go on holiday.

We also use ships to carry out important scientific research. We have only explored a very small percentage of the ocean and scientists rely on purpose-built research vessels to carry kit and crew to special places at sea where they can deploy submersibles and robots to explore the deep.

Research vessel with ROV: Photo credit – ATLAS project
Cargo ship (next page): Photo by the beatboy. on Unsplash



