



Jane
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Learning Resource



Ocean life

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Ocean life



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What kind of plants and animals live in our ocean? Why is the life we see in a warm sea like the Indian Ocean different from what we see in a cold sea like the North Atlantic?

In this activity you and your students will:

- ▶ Look at the environment of the northern North Atlantic and northern Indian Ocean.
- ▶ Look at some typical animals of each ocean.
- ▶ Look at the differences and similarities between these fauna and relate them to the environmental differences.
- ▶ *Optional:* Take it further by exploring the effects of climate change on life in our oceans.

What do I need to make it work?

For this activity, you'll need:

- ▶ Access to the internet
- ▶ Material to make a wall chart

What things will my students create?

- ▶ A wall chart/map showing typical fauna and conditions in the two studied locations.

Warm seas, cold seas, ocean currents

This resource looks at the different types of life that live in different areas of the ocean, particularly the difference between warm and cold seas. If you want to know more about *why* some seas are warm and others are cold then be sure to also try our 'Warm seas, cold seas, ocean currents' resource.



Photo by Felix Rottmann: <https://www.pexels.com/photo/tail-of-a-whale-above-water-10305569/>

Want to help improve this activity?

This activity is a living document! Help us by editing this activity to make it as good as possible, just use this short link (just type it into your web browser's address bar): bit.ly/3O93L37 – full instructions are provided. Any edits that can make this resource easier to use in the classroom are very welcome, so please follow the link and make your contribution!



SCAN ME

JGI & DP World

The Jane Goodall Institute has partnered with DP World to support the growth of the Roots & Shoots programme. DP World are a leading provider of worldwide smart end-to-end supply chain logistics with a presence in 55 countries, enabling the flow of trade across the globe. This exciting partnership supports the creation of resources on the wider marine ecosystem as well as supporting the expansion of Roots & Shoots groups around the world. **Find out more:** bit.ly/jgi-dpw



The northern North Atlantic

The North Atlantic is the area of the Atlantic Ocean that lies north of around 8°N. We are going to look at the more northerly part, from around 35°N.



Split your students up into 2 groups to do some research. The first group will investigate the environment of the northern North Atlantic, the second group will investigate the animals.

Environment

Here are some questions for the environment group to tackle:

- ▶ Average sea temperature. This is most easily researched by looking at the available data for a series of places, for example Porto in Portugal (towards the south of the area), Donegal in Ireland (in the East of the Atlantic), St Anthony in Canada (a similar latitude to Donegal, in the West) and Hammerfest in the north of Norway.
- ▶ Average visibility. It's difficult to find accurate information about this, but a fun way to get a feeling for ocean visibility is to look through some scuba diving videos on YouTube for various locations. Look for dives out in the ocean where possible. Some possible search terms are 'scuba greenland', 'wreck dive norway', 'scuba west coast ireland', and 'scuba lisbon'.
- ▶ Average number of stormy days per year. This can be compiled from this resource from Colorado State University: bit.ly/3zLzJxY
- ▶ Deepest part and average depth.
- ▶ Number of islands. Rather than aiming for a number here, students can take a look at a service such as Google Maps and rate whether there are very few, few, many or very many islands. Make sure you zoom in!

Animals

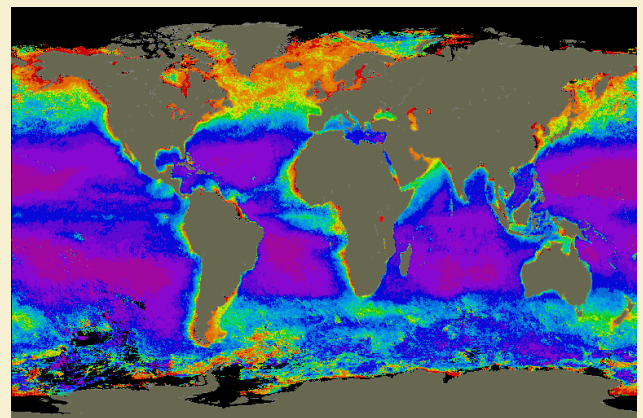
Here are some questions for the animals group:

- ▶ How much phytoplankton is there? Is there very little, little, quite a lot or lots?
- ▶ What are some of the most common types of fish?
- ▶ How many different species of fish are there? Are there very few, few, many or very many?

- ▶ Do the fish tend to be colourful or fairly dull?
- ▶ The three fish questions can be tackled in a variety of ways, but one quick method is to look at the Wikipedia category page for 'Fish of the North Atlantic' (bit.ly/3y1jA64).
- ▶ What marine mammals can you find in this region?
- ▶ What sort and quantity of corals can you find in the region? Are they solitary corals, or are they reef-building corals?

Phytoplankton

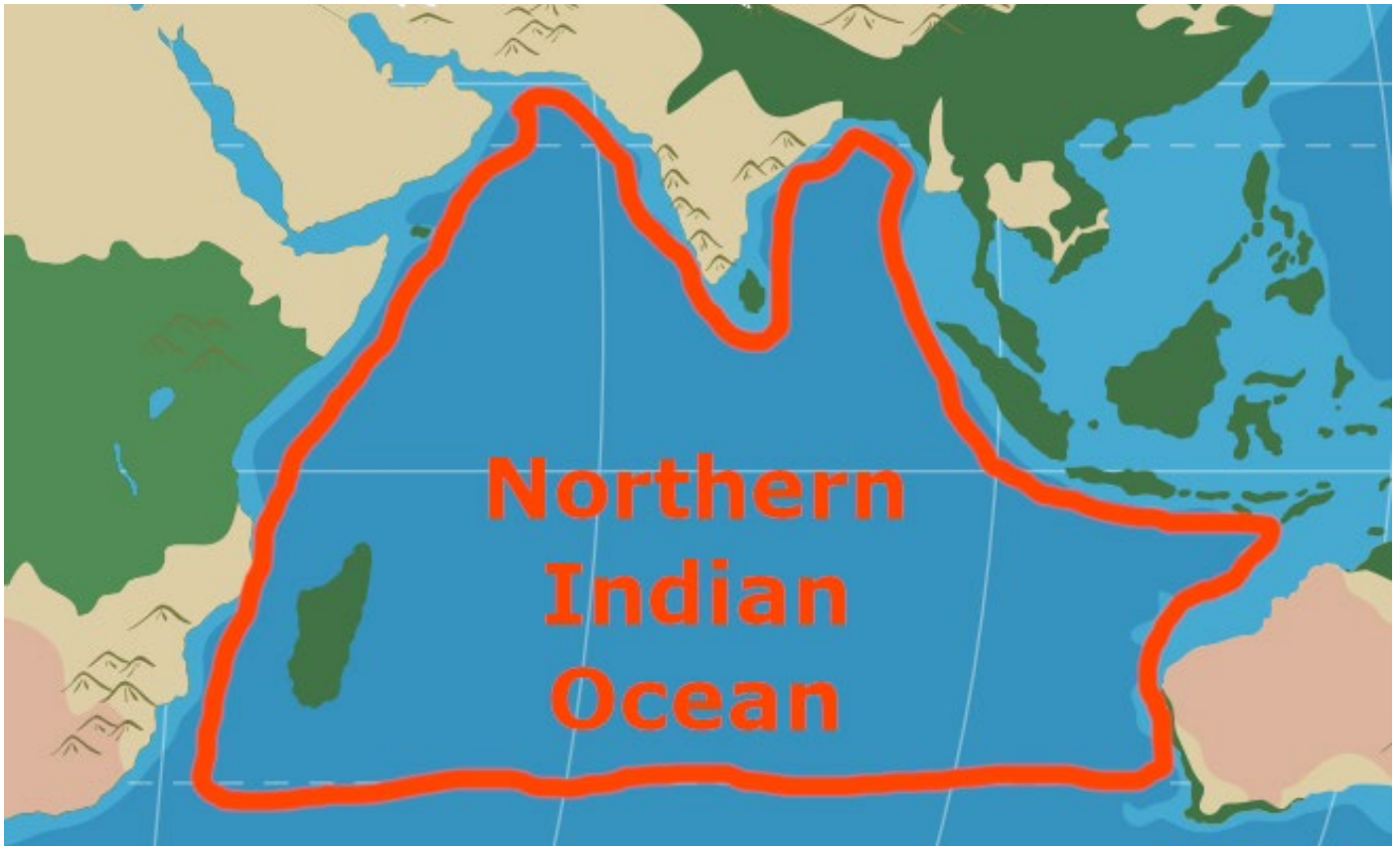
Phytoplankton are single-celled organisms that photosynthesise like very small plants. They are also a very important foodstuff for many animals, so the more phytoplankton there are the more animal life that can be supported. Find out more about them and where they live here: bit.ly/3PRD2t6 and if you want to know more about why they are distributed as they are then check out our 'cold seas, warm seas, ocean currents' resource.



Red and orange indicate high concentrations of phytoplankton. Concentrations decrease as you go down the colour spectrum. Image from NASA's SeaWiFS mission. Downloaded from bit.ly/3PRD2t6

The northern Indian Ocean

The northern Indian Ocean is the area of the Indian Ocean that lies roughly between the Tropic of Capricorn (around 23.5°S) and the Tropic of Cancer (around 23.5°N).



Swap over your two student groups so that the group that studied the environment for the North Atlantic are studying animals for the Indian Ocean. Now, try and answer the same questions as before.

Environment

Here are some Indian Ocean specific hints for the environment group:

- ▶ Average sea temperature. Check Mombasa in Kenya (in the centre west of the area), Padang in Indonesia (centre east), Gwādar in Pakistan (north), Saint-Paul in Réunion (southwest) and Carnarvon in Australia (southeast).

- ▶ Average visibility. Some possible YouTube search terms are 'dive coral bay australia', 'dive pulau weh', 'dive oman' and 'dive durban'.
- ▶ Average number of stormy days per year. Use this resource from Colorado State University: bit.ly/3zNfnEq

Animals

Here are some Indian Ocean specific hints for the animals group:

- ▶ The Wikipedia category page for 'Fish of the Indian Ocean' is bit.ly/3b4ZuyX



Compare and contrast

What are the key similarities and differences between the two oceans?

Depending on time available and the age of the students, you might want to ask the groups to present their findings to one another (they could include some images plus a short section of a representative dive video) or you could summarise for them. Key findings should include:

- ▶ The Indian Ocean is much warmer than the North Atlantic.
- ▶ The eastern side of the North Atlantic is warmer than the equivalent latitudes in the west, whereas the Indian Ocean is more uniform.
- ▶ In general, underwater visibility is higher in the Indian Ocean than in the North Atlantic.
- ▶ The North Atlantic is considerably stormier than the north Indian Ocean.
- ▶ The North Atlantic is deeper than the Indian Ocean.
- ▶ Although it's still very sparse, there are more islands in the Indian Ocean than in the North Atlantic.
- ▶ Although the phytoplankton map suggests there is more life in total in the North Atlantic, it is home to relatively few different

species of fish, and they tend to be dull in colour compared to what we see in the Indian Ocean.

- ▶ The North Atlantic contains relatively few corals and they are almost all solitary, as opposed to the Indian Ocean where you can find a large number of reef-building corals.

Can your students connect some of their environmental findings to their animal findings?

Why are the Indian Ocean fish so colourful?



There are a lot of things that affect the colour and patterns on fish (there is a great article here in Dive Training magazine: bit.ly/3QAzZ8O), but a major underlying factor is the availability of light. The lower visibility in the North Atlantic (itself caused by more storms and more phytoplankton) caused fish eyes to evolve to favour particular wavelengths of light – the fishes' colours and patterns then adapted too, into what looks to us surface dwellers as being less colourful.

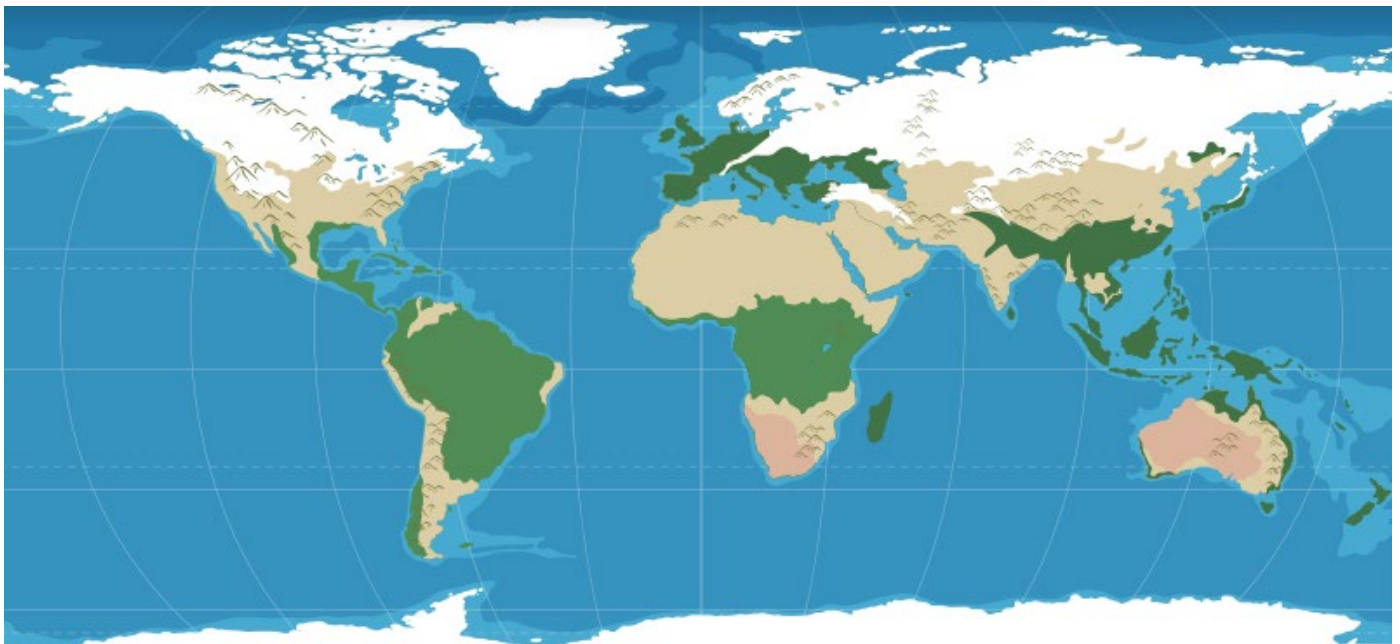
Make a wall display

Now we've done the research, let's display it!

Prepare a basemap

First, you'll need to print out a map of the world. We can then use this as a base map to add different layers to, in this and other activities.

We've prepared a low-ink colour map for you to download and print: bit.ly/rs-globe-map or you could make a map of your own.



Add your findings

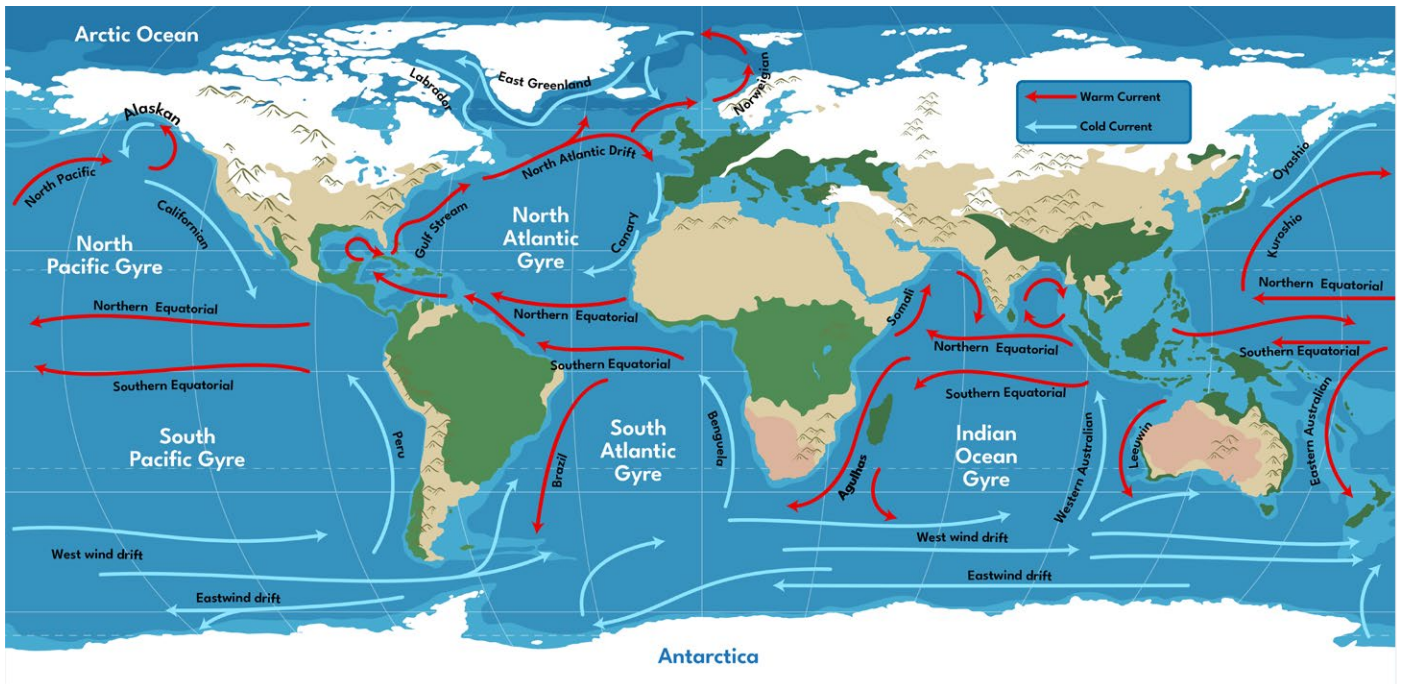
Decorate your map with your findings. You could include print-outs of some of the common fish types, marked points to show

average temperatures, locations of large coral reefs, anything!

Taking it further

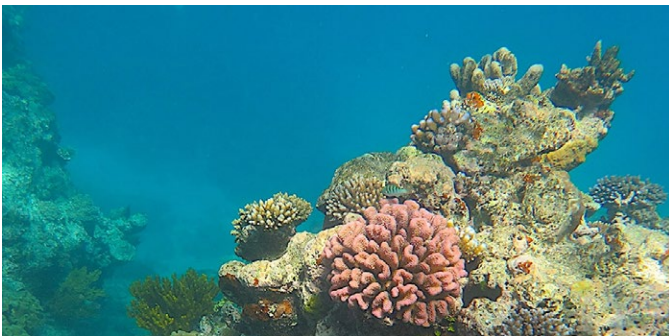
With your basic research in place there are lots of directions to take to expand this activity. Here are some suggestions:

Warm seas, cold seas, ocean currents



If you want to know more about why some seas are warm, others are cold and how this affects the distribution of life then be sure to also try our 'Warm seas, cold seas, ocean currents' resource.

Coral reefs



Diverse coral community at Norman Reef in the northern Great Barrier Reef, Australia by Rebecca Jackson, CC BY-SA 4.0 <<https://creativecommons.org/licenses/by-sa/4.0/>>, via Wikimedia Commons

In terms of fauna, one of the big differences between the North Atlantic and the Indian Ocean is the prevalence of reef-building corals. Some things to research:

- ▶ Is a coral a plant, an animal, or something different?
- ▶ What temperature of water is optimum for reef-building corals?
- ▶ How deep/shallow does the water need to be for a coral reef to form? Why?
- ▶ Can you relate what you have learnt about corals to the observations you have made in this activity?

Climate change



Bleached branching coral (*Acropora* sp.) at Heron Island, Great Barrier Reef. Author: J. Roff. By *Acropora* at English Wikipedia, CC BY-SA 3.0 <<https://creativecommons.org/licenses/by-sa/3.0/>>, via Wikimedia Commons

The effect of man-made climate change on our oceans is heart-breaking and ever increasing. Some particular effects you might want to explore more include:

- ▶ Coral bleaching: what causes it and what effect does it have on the reef community? There are a series of resources published by NOAA in the US which can help explain this: bit.ly/3QuNvei
- ▶ Range shift: as temperatures change in the ocean, the range of various species change, which can have dramatic effects on other species which rely on their presence. This Scientific American article is a good starting point: bit.ly/3xl7Xj5

Want to do your bit to tackle climate change?

Every little helps when we work together! There are lots of things that you and your students can do to help cut your energy use by reducing, reusing and recycling. You can find some great resources to get you started on the Roots & Shoots UK website at bit.ly/3zPxIAY

Tell us how you got on

When your project is finished we'd love to see what you did! If you already have an account you can upload a story with images to the Jane Goodall's Roots & Shoots UAE website (find us at uae.rootsandshoots.community) to show off pictures and videos of your ships to a wider audience. If your school or youth group does not already have an account then just fill in the form on the website and we can set you up.

Keep up to date with Jane Goodall's Roots & Shoots UAE

As well as the website you can also find us on Facebook at facebook.com/RootsnShoots.ae or on Twitter as [@JaneGoodallUAE](https://twitter.com/JaneGoodallUAE)

