



Seaful

I Know Our Ocean

A complete course in Ocean Literacy



“People protect what they love,
but they only love what they know”





I Know Our Ocean

User Guide



INTRODUCTION

This resource pack is designed as a complete course, focusing on the seven 'Blue building blocks' or seven principles of Ocean Literacy which, as defined by the UN, is :

'an understanding of the ocean's influence on you and your influence on the ocean'

Each principle has its own themed workshop. Whilst we recommend you complete all seven, each one can be used as a standalone session. A blue ribbon connects all themes, to demonstrate their interconnectedness. Each workshop requires a facilitator to lead the session, but they do not need any background in the subject matter, just enthusiasm!

Each workshop has a set of learning outcomes for the audience 'to know' and a set of tiered activities, which are **colour coded** as follows:

- **A starter session:** Quick, easy, ice breaker activity for all user groups, to unpack the theme and get the participants thinking (15 minutes approx)
- **A group activity:** Longer, creative tasks for group learning in a team based way (30 minutes to 1 hour approx)
- **A follow on activity:** Extended session for school groups, including desk based learning (2+ hours)
- **Extra resources:** For use as needed and for those that are super engaged with the theme

LEADER NOTES:

- Starter sessions and group activities can be done anywhere, weather permitting, but follow on activities are designed to be classroom based.
- Some activities required basic resources, but these have been kept to a minimum.
- It is recommended that workshop plans be printed or projected where possible.
- A glossary of terms and facts is provided for reference where needed.





I Know Our Ocean



Glossary of words and facts

Ocean: A large, continuous body of salt water that fills the Earth's basin and covers over 70% of the Earth's surface

Sea: A smaller body of salt water that is usually found where the ocean meets the land

Why is the ocean blue? Visible light has different (rainbow) colours in it and blue light is the longest and most easily bounced around and reflected by the ocean

Why is the ocean salty? The salt comes from the wearing down of different rocks and minerals

Ocean sizes (biggest to smallest): Pacific, Atlantic, Indian, Southern, and Arctic Ocean

Biodiversity: All the different kinds of life (animals, plants, fungi, bacteria etc.) that you find in one area (e.g. of the ocean)

Ecosystem: The living (animals, plants etc.) and non-living things (air, water, soil etc.) in an environment and how they interact

Aquifer: A source of groundwater that collects in empty spaces underground

Spring: A source of freshwater that comes up from underground and flows on the surface

Estuary: Where a river meets and opens out into the ocean. Here fresh water mixes with salt water

Bathymetry: The depth, shape and features of the ocean floor

Abyss: The deepest part of the ocean floor and water column (from 3000 to 6500 metres), where sunlight doesn't penetrate

Coelacanth: An ancient type of lobe-finned fish from which the first tetrapod (four limbed) creatures evolved

Plankton: Microscopic animals and plants in the ocean that drift on ocean currents and are the base of the food chain

Planktonic diatoms: Unicellular algae (plants) that produce energy using sunlight for the rest of the ocean to use

Marine algae: Plant-like life in the ocean from tiny plankton all the way though to large seaweeds and kelp

Marine Protected Area (MPA): A conservation area of the ocean where human impacts are managed due to its biodiversity importance

Ocean optimism: Having hope, courage and taking action to protect the ocean for the future

Conservation : The protection of biodiversity and ecosystems for the future benefit of all

Manifesto: A written statement of intentions, wishes and actions (in this case to protect the ocean)

Ocean activism: Communicating and campaigning for the ocean to bring about positive change



One ocean

Ocean
S



KNOW:

There is only one global ocean

Ocean water moves around the planet in an endless cycle of motion, connecting us all

What's in a drop?

Mindful moment...

Are you a drop in the ocean or the ocean in a drop? Discuss.

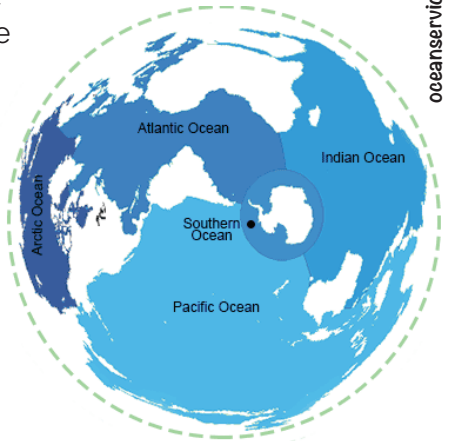
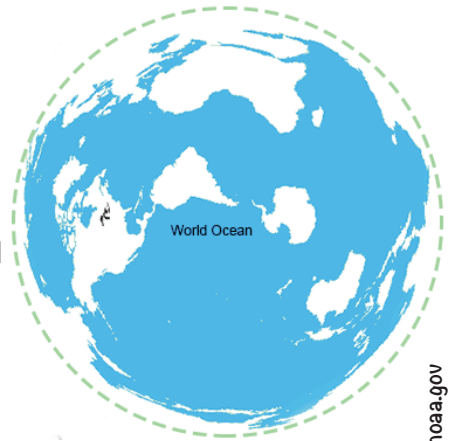
Imagine you are a drop...what drop would you be and where? Discuss.

Try this 3 minute Ocean Drop Meditation: <https://youtu.be/tQEb5mL8I7M>

We are all connected to that drop in the ocean. Let's see how.

Write down the following 'drops' on post it notes or similar (raindrop, puddle, aquifer, spring, stream, river, estuary, ocean, cloud, vapour) and randomly hand out one to each of participants.

Starting with the smallest drop, pass the drops (or post it notes) around the group, collecting them together as you go i.e. the last person should be the biggest water body and should end up with all the post its. Discuss.



oceanservice.noaa.gov

What is ocean?

Ask the group, what does ocean mean to you? Either say it or write it down. Then ask, how would you describe 'ocean' to someone who doesn't know? As a group discuss and create a mind map (on paper or on the ground) of what ocean means to us all. Prompts: How many named oceans are there? Which is biggest and which is smallest? Why is the ocean blue? Where does salt come from? What is the difference between 'ocean' and 'sea'? See glossary for help.

What does our ocean look like?

The ocean is a vast 3-dimensional space, always moving and never the same. Create a 3D map of the ocean or build your own 3D model.

Try and include the following features in your design:

- What the ocean floor looks like and it's features (bathymetry)
- The tidal zone, coast, open ocean, the deep abyss
- The depth to which light penetrates (around 200m)
- What lives in your ocean and where?

N.B. There are lots of 'ocean zone diagrams' online for ideas and inspiration.

Bring your ocean to life..!



Extra resources

- <https://oceanservice.noaa.gov/>
- <https://noc.ac.uk/education/educational-resources>
- <https://neal.fun/deep-sea/>



Ocean of life



KNOW:

The ocean and the life within it shape the features of the earth

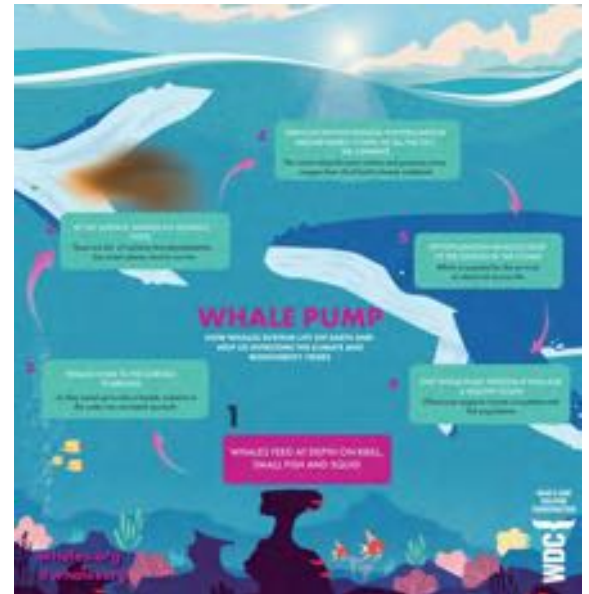
The ocean gives us life - every other breath we take is provided by the ocean

The life of a whale

Whales tell a story of life in our ocean, if we are ready to listen...

Read this aloud, then discuss:

My story comes from the deep, from the salty depths you'll likely never know,
As a journey maker I rise and fall, traversing the abyss, I come and go.
A salty soup I sink through, to find my peace and calm,
But I know the surface too, rising through layers, the sun on my skin like balm.
They call me 'the farmer of the ocean', but they don't know me at all,
I'm that black shiny fluke in the distance, they hunt with their boats and they call.
They motor across the waves to catch me, but just in time I descend,
As I spiral and turn I blow bubbles, I mix salts and sugars with no end.
I provide a tiny army of producers with food, I tend and I care for my team,
They bloom and dance in my pathways and on the dark night surface they gleam.
A long life I lead and much matter I consume, but all lives must come to an end,
And as I sink to the bottom, lifeless but free, I will rest here as food for my friends.
They talk about trees so much up above, on the land where they dance and sing,
But know me now, as you look out to sea, for my life is key to everything.



Use this diagram to help you discuss

Every other breath

FACT: The ocean generates 50% of the oxygen we need, produced by plankton and marine habitats such as seagrass and kelp forests.

Get the group to practice ocean breathing... as follows:

Close the eyes and begin to take slow, deep breaths in through the nose and out through the mouth.

As you inhale, imagine you are filling your lungs with the clean, fresh air of the ocean, and as you exhale, blowing a breeze across the ocean, releasing any negative emotions or stress. Listen to the sound of the breath, like the sound of waves ebbing and flooding the shore. Repeat process for as long as you wish, but explaining after that half that time you spent breathing was ocean made.

Whales and trees

Whales are ecosystem engineers - they change the environment around them for the better and keep the ocean healthy. Some people say that we should save the whales before saving the world's forests and that 'one whale is worth a thousand trees' (IMF, 2019). But what do you think? Is it easier to love forests than whales as they are in our world? Are there not other important blue carbon habitats to save first like coral reefs? Do some research into blue (and green) carbon habitats and species and have a debate on 'what to save first in the fight against climate change'?

Extra resources

- <https://uk.whales.org/whales-dolphins/climate-giants/>
- <https://www.fisheries.noaa.gov/feature-story/whales-and-carbon-sequestration-can-whales-store-carbon>
- <https://www.un.org/en/climatechange/science/climate-issues/ocean>
- <https://www.projectjonah.org.nz/whales-and-climate-change/>



Ocean System

Ocean



KNOW:

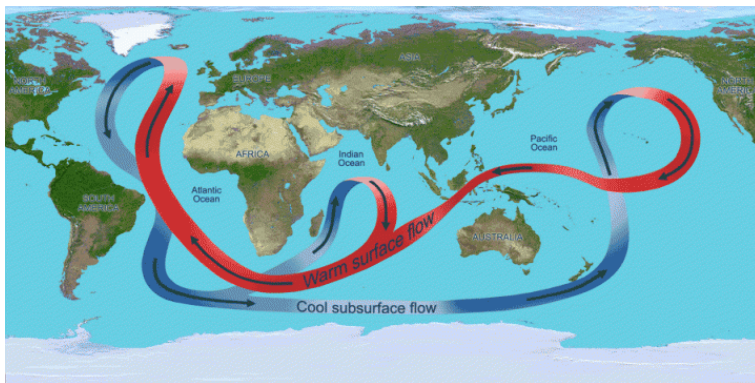
The ocean moves around the world, caused by changes in salt, density and temperature
The movement of the ocean controls our climate

The great conveyor belt

There are two main conveyors of water in the ocean:

i) wind blowing across the surface and;

ii) deep sea rising and sinking of water of different temperatures and densities



www.ces.fau.edu

Try an ocean conveyor Mexican wave!

Draw the map (left) in the sand or on the ground using (preferably red and blue) coloured chalk, or string. Spread participants out across the map. Imagine a body of water, rising, falling and being blown around the world. Participants need to rise and fall (crouch or stretch) as the ocean energy passes around the map i.e. moving 'up' is warm, less dense water rising and moving 'down' is cold, more dense water sinking. Good luck, discuss and have fun!

The human ocean

The ocean has health, like the human body and can worsen over time if it's not looked after. Comparing the ocean to a human body is a powerful way to understand its functions.



Mindful moment...

Lay on the ground (beach, board, floor or whatever you prefer) and stretch out your body. Tune in to your breathing and your heart beat. Imagine your breath as a wave rising and falling, ebbing and flowing through your body. Imagine next your heart beat pumping a current of energy to its deepest depths and the furthest shores. Imagine a drop of water passing from your heart and around every organ and limb. Just to make you laugh, follow this up with a discussion of what other parts of the human body we can compare with the ocean....maybe even draw your idea if you like!

Case study: El Nino

El Nino is a powerful climatic system that affects both the Pacific and Atlantic realms of the ocean. Watch this WMO video to explain: <https://www.youtube.com/watch?v=AcwpLNi70ts>

El Nino has some very significant affects on weather, climate and communities, but is it all bad, are there not winners AND losers? Get the group to research, present, debate and reflect on this question, using visuals where possible. See resources below to start...

Extra resources

- <https://ncas.ac.uk/what-does-el-nino-mean-for-our-weather-climate-economy-and-health/>
- <https://www.imf.org/external/pubs/ft/fandd/2016/03/cashin.htm>
- <https://www.weather.gov/tae/enso>



Ocean evolution



KNOW:

The ocean made the earth habitable

The ocean's density means it supports the biggest animals that ever existed, and the smallest...

A fish caught in time

What is a fish? How would you describe it to someone who didn't know? Hard isn't it? But important considering we all descended from the fishes!



The story of the Coelacanth (left) is one of the greatest tales of ocean evolution. Watch the video and discuss: https://www.youtube.com/watch?v=__Woo6L1b1O

They might not be the most photogenic of fish, but they can tell us much about how we evolved from the ocean and onto land. A four limbed dino fish, they have remained unchanged for millions of years.

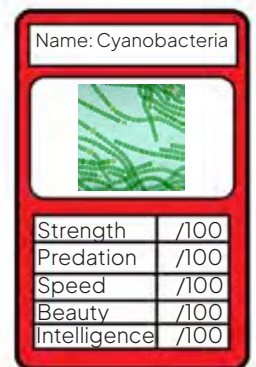
Imagine what it would be like to swim in the prehistoric ocean... Take a dive (if you can) using the VR headset... What can you see? Who do you meet? A predator, prey, or a long lost distant relative...?

Mindful moment...

Imagine what it's like to be a fish. Imagine how it feels to move through water, use your fins and swim...!

Evolutionary oddballs

There are many freaky fish and wacky whales in the story of ocean evolution. But there are some pretty cool tiny things too, that oxygenate the oceans, like planktonic diatoms and marine algae. Imagine you are an 'Evolutionary Oddball' what would you choose? What would your super powers be? Create your own top trump card (agreeing the power categories as a team) and then get the group to compete with each other. Use the template (right) if you like, or write down/memorise your scores and then pair up and duel with each other! Who comes out on top?!



The whale that walked

After fish walked onto the land, they evolved dramatically, but then returned to the sea....why? Was it to have more space, or find more food? Discuss.

Ask the question: What is the largest animal that has ever lived? A: The blue whale. But how did it get so big? Discuss.

Watch the video: https://youtu.be/_OSRkT_9vw?si=Kwaf86HF5pEKD6Ck

Create an evolutionary time line of the key moments in the evolution of marine species (see resources below to start). Make it as big and as visual as you can.



Ambulocetus natans

Extra resources

- <https://ocean.si.edu/ocean-life/fish/coelacanth>
- <https://ocean.si.edu/through-time/ocean-through-time>



Blue biodiversity



KNOW:

The ocean supports a great biodiversity of life and ecosystems
All ocean ecosystems have key components that need to be kept healthy and in balance

Local heroes

Mindful moment...

Our ocean is a big place, full of an amazing diversity of weird and wonderful habitats and species. It's size can be overwhelming at times, so let's start local and use our senses. Go to your local beach, lake, stream or pond, either physically or in your mind and find the following natural (not man made) things: Something you can hear (closing eyes is good for this); something you can smell; something that feels good to the touch; something that moves. Share your things with the rest of the group.

Ocean superheroes

Ocean ecosystems have 4 main components:

Foundation species



Umbrella species

Foundation species:

The engineers that structure the community and hold it together

e.g. seagrass beds, kelp forests

Umbrella species:

Large species with large ocean ranges, which if present indicate ocean health and high biodiversity

e.g. whales, salmon, turtles

Indicator species:

Rises and falls in their abundance indicate changes in ecosystem health e.g. temperature changes, pollution etc.

e.g. Jellyfish, anemones, crayfish

Keystone species:

Their behaviour alters the habitat around them, benefiting other species e.g. sharks, otters, starfish

Choose one of the four categories and a superhero representative and think of a 'day in the life' story that explains it's role. Share with the rest of the group.



Indicator species



Keystone species

The Spillover Effect

When an area of ocean is left alone, marine life will grow and spread into the unprotected area to find more space and habitats of their own, including fishing grounds. In this way, these Marine Protected Areas (MPAs) are fundamental to the health of our future ocean. e.g. Lundy MPA (see video below).

MPAs are a win win, for both fishing and people. Create your own version of the infographic (right - showing spillover in a kelp forest) for a protected UK superhero habitat. Choose from: coldwater coral reef, seagrass bed, kelp forest; estuary etc. Make it digital, a collage, a painting, or your own choice.



Extra resources

- <https://www.nrdc.org/stories/keystone-species-101>
- <https://oceana.org/blog/protecting-our-ocean-a-race-to-30-by-2030/>
- <https://www.youtube.com/watch?v=A6tYCGazFsA>

My ocean



KNOW:

We are all connected to the ocean even if we can't see it, hear it or feel it
What I do affects the ocean and everyone can make ocean friendly behaviour changes

Me and the sea

Mindful moment...

Depending on who you are and what you care about, the ocean can mean different things to you. To some the ocean is a playground, to others it is a peaceful, calm place. And to others it is a deep, dark, scary place. All these feelings about the ocean are okay.

Think of an image in your mind (or draw it if you like) that sums up how the ocean makes you feel. It might be a childhood memory, a family photograph, a view or an experience. Whatever it is...share, compare and discuss.



Blue heart mapping

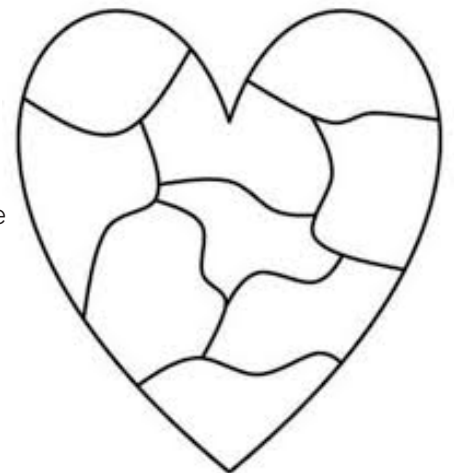
Ask the group: What do you care about most? What makes you, you?
What could you not live without? Share a 'this is me top three' with each other.

Heart map

Use the template (right) to draw a large heart (or your own version) either on paper, in the sand, or chalked on the ground. Working from the core outwards, write or draw the things most fundamental to you, getting less essential as you move into the outer reaches of your heart. Prompts for the group include:

- Who or what do you care about most?
- Where is your favourite place to relax?
- What is your happiest childhood memory - a family holiday perhaps?
- What is your most treasured possession?
- What is your dream?
- What are your hobbies?
- What's your favourite animal?
- What is your favourite food?

Then 'Blue your heart'. Colour in sections blue which do or could link you to the ocean. If nothing does, then not to worry. Maybe the people you have mentioned link you to the ocean? Look around the group to see who has the 'bluest' heart and discuss



**Don't know where to start...
...speak from the heart!**

My ocean masterplan

Ocean conservation should always start closest to home. But where is 'your ocean'?

Conduct some research into your closest beach, coastal zone or regional sea. Find out: a) what marine ecosystem features are important within it; ii) what are the human impacts on the ecosystem; iii) what can be done to protect it? and iv) who are the NGOs or community groups already working hard to protect it, who you could get involved with?

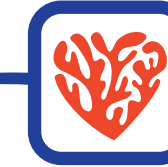
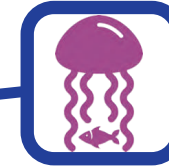
Task: Create your 'ocean masterplan' or manifesto, either as a group or individually. You can write it, draw it, or both!

Extra resources

- <https://news.un.org/en/story/2017/05/55683>
-podcast-saving-blue-heart-planet-sylvia-earle



Ocean futures



KNOW:

The ocean is largely unexplored and as a global society we know very little about it. We can demystify the ocean by experiencing it and being hopeful about its future.

Into the deep

Mindful moment...

It is a human instinct to find deep, dark bodies of water frightening and somewhere to avoid. But not all of us feel that way - to many the ocean is a playground or a place of calm.

Look at the picture (right). How does it make you feel?

Share words and feelings that this image triggers. Discuss those which are more positive and those which are more negative responses. Know and accept that we are all different but if we accept our feelings we can get to know our ocean better...and that's key to protecting it...



As an extension (or an alternative)...try the deep dive workshop in the resources below

My ocean dream

We have become used to endless bad news about the ocean and its poor health and whilst there are lots of reasons to be angry and upset, having 'ocean optimism' about a healthy future ocean is possible.

Ask the group 'what is your ocean nightmare'? Get them to draw or imagine what this looks like. Share and discuss. Prompts to ask: Where is this? Are there people in the picture? What is the biggest threat?

Ask the group 'what is your ocean dream'? Get them to redraw or reimagine the scene in an ideal healthy future. Share and discuss again.

Prompts to ask? What has changed? Why has it changed? Are there people in this picture?



Coral reef destruction



A healthy biodiverse reef

Finding blue hope

Hope is important and it is the best starting point for ocean action and change.

A network of blue 'Hope Spots' are being created around the world. See the website below for more details. These protected areas are pockets of the ocean which can be a focus for change. But it can be hard to convince people that change is possible, given all the ocean bad news we hear about our ocean.

Task: Find a piece of ocean bad news and create an action based campaign with a possible solution to the problem, that would help people find the hope. You could make a poster, create a video, or even write a speech!

Tip: Try and find an ocean activism campaign online that works and try and apply a similar approach to your problem.

Extra resources

- <https://neal.fun/deep-sea/>
- <https://www.chasingcoral.com/>
- <https://www.youtube.com/watch?v=aGGBGcjdjXA>
- <https://missionblue.org/hope-spots/>

