



Science Week

Stage 2 Activity Booklet

*Deep Blue: Innovation for
the Future of our Oceans*



Name: _____

If you complete this booklet you can ask for **5 hours in your Passport!**
If you would like help ask your family for ideas to complete this booklet.





DID YOU KNOW

All but **one** species of penguin live in the Southern Hemisphere! The Galapagos penguin is the only species that lives **north** of the equator!
There are **18 species** of penguins, but **only 7** live on Antarctica and the surrounding islands!

When we think of Antarctica we usually think of **penguins!**

Penguins vary in size from Little Penguins at 30 cm tall to Emperor Penguins at 130 cm tall!

Measure yourself using a ruler (you may need someone to help).

Write your height here: _____

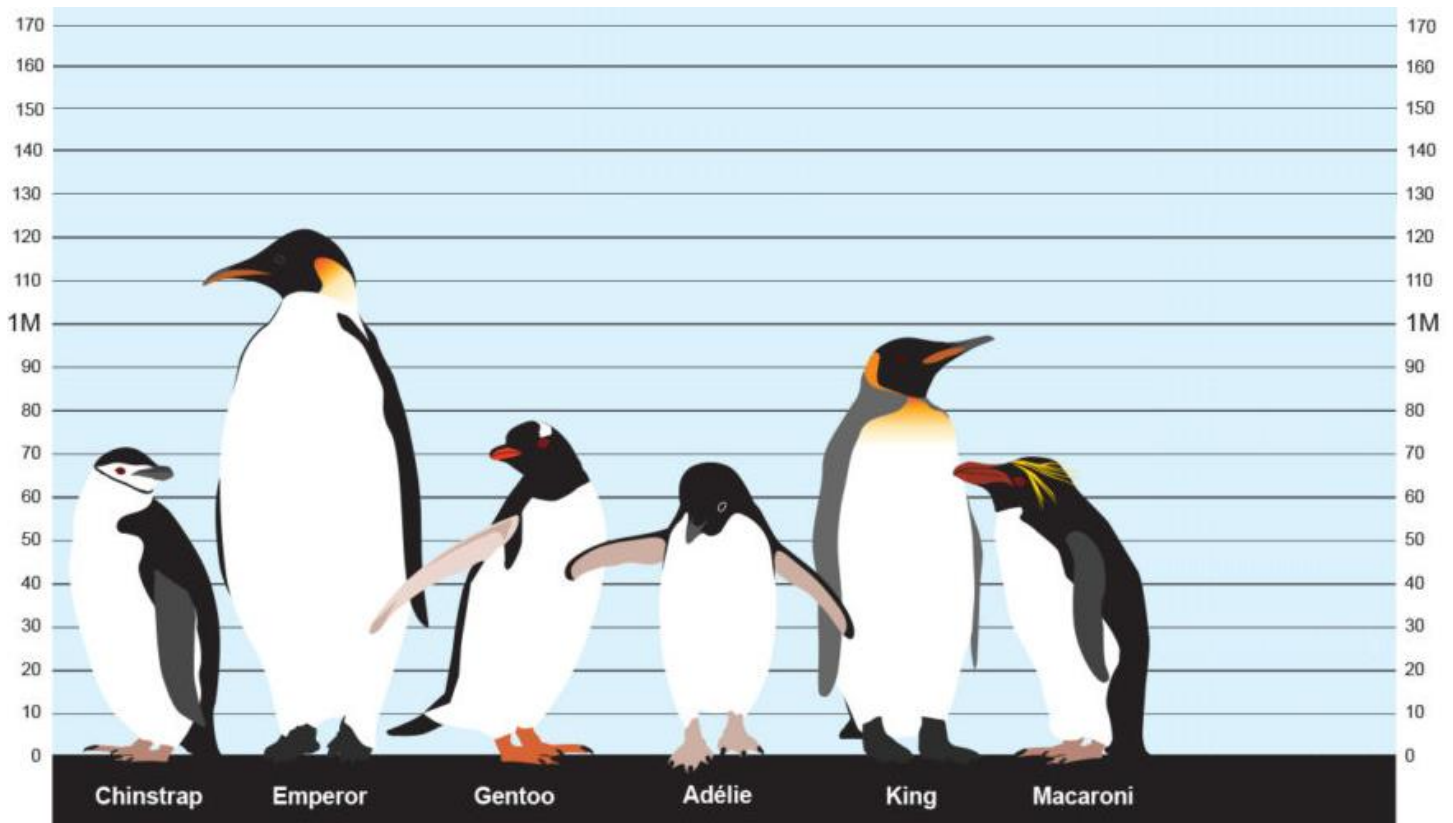
Draw yourself on the chart beside the penguins.

Which of the Antarctic species is most similar to your height? _____

How tall is this species? _____

One Antarctic species is missing from the chart below. Use this website to find which species is missing and write the name here! _____

<https://www.hurtigruten.com.au/destinations/antarctica/inspiration/wildlife/meet-the-penguins-of-antarctica/>





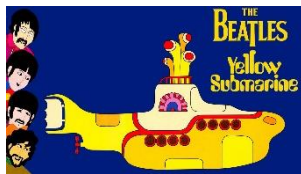
Oceans play an important part in controlling the **climate and weather**, as well as providing us with food, energy, fuels, minerals, routes for communication and transport and, of course, a large area for **recreation!**

The oceans and their wildlife have provided us **with myths and legends and subjects for stories, painting, music and poetry.**

Your challenge is **to design an exhibition piece for an underwater museum** inspired by a myth, song, painting or story. You can use the back of this page or create your piece on another piece of paper or cardboard!

Some suggestions are:

Yellow Submarine – The Beatles



Bermuda triangle



Surfin' USA – The Beach Boys



The Little Mermaid – Hans Christian Andersen



Moby Dick – Herman Melville



Atlantis



The Great Wave of Kanagawa



Loch Ness Monster



Jaws



Poseidon



The Kraken





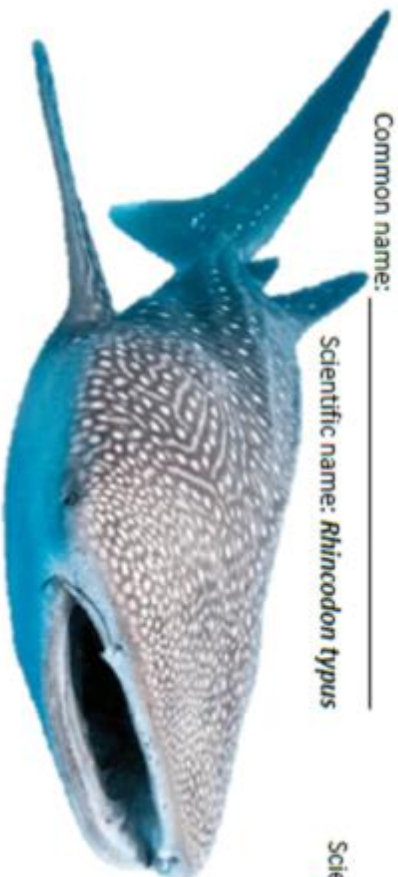
Ecotourism lets people enjoy the natural environment in a safe and sustainable way. Coral reefs are one fantastic environment you can visit to snorkel, dive, swim and walk through beautiful ecosystems!

These animals can all be found on coral reefs around Australia. Use books or the internet to fill in their scientific or common name. On the back page create a profile for one of these animals OR pick your own animal to research.

DID YOU

KNOW

The whale shark is the largest fish in the ocean. This shark is a filter feeder and doesn't have teeth. Sea snakes are a type of marine reptile. There are 55 species of sea snakes. All species of sea snakes very are venomous and should never be touched.



Common name: _____

Scientific name: *Rhinocodon typus*

Common name: _____

Scientific name: *Carcharhinus melanopterus*



Common name: _____

Scientific name: *Amphiprion ocellaris*



Common name: Green Moray eel

Scientific name: _____



Common name: Green sea turtle

Scientific name: _____



Common name: _____

Scientific name: *Thaumoctopus mimicus*



Common name: Yellow-bellied sea snake

Scientific name: _____



Common name: _____

Scientific name: *Chlorurus strongylocephalus*



Common name: Common lionfish

Scientific name: _____

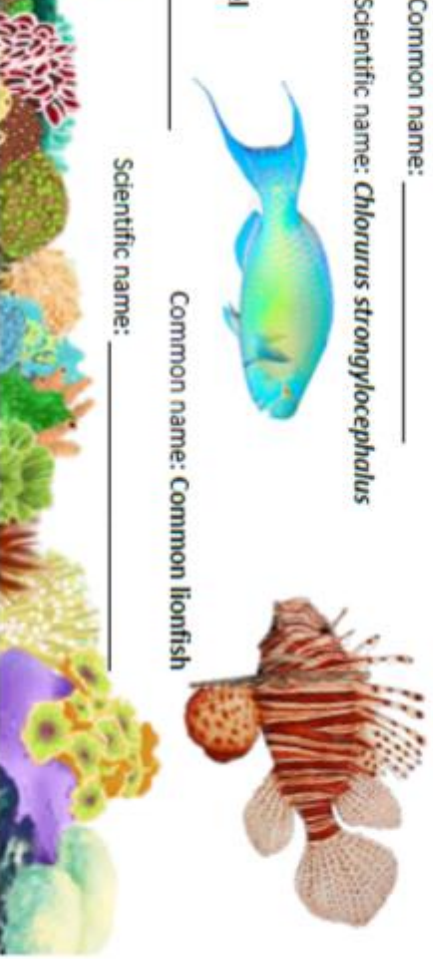




PHOTO OR DRAWING

Common name: _____

Scientific name: _____

Type of animal: mammal reptile
 invertebrate fish

Description: _____

Length: _____

Weight: _____

Habitat: _____

Diet: _____

Life span / age: _____

Interesting facts: _____



Why do polar bears look white?



What colour is a polar bear? They look like they have white fur, which blends in with the snow and ice sheets they live on. Polar bears actually **have transparent** (see-through) fur, **so why does it look white?**

Polar bears have **hollow hairs**. When light from the sun travels through each strand of hair, it **gets bent around** and appears to be white. Their fur is double layered to keep them warm in the Arctic.

The **National Maritime Museum** has a great experiment to test this!

<https://www.sea.museum/discover/apps-and-games/kids-craft/arts-and-crafts-blogs/polar-science-experiment-why-do-polar-bears-look-white>

What You'll Need:

- A cup
- Water
- A sheet of paper with 2 arrows pointing the same direction

To Do The Experiment:

Place the sheet of paper with arrows upright
Place the glass in front of it.
Pour water to cover the first arrow

What has changed?

How does this happen?

Adding the water to the cup causes the light to bend and created visual illusions, like a flipped arrow and white polar bear hair!



DID YOU KNOW

Polar bears have black skin and transparent fur? Their fur has no pigment but appears white due to bent light in the strand.



Take photos, a video or drawing of your experiment as evidence to your CU coordinator!



Cetaceans in culture and mythology



Whales and dolphins are part of a group of animals called **Cetaceans**. You say this word like 'seh-tay-shun'. The word **CETUS** comes from Latin, meaning large sea creature, and **ACEA** means "of the nature of". When you combine those two, the word means "creature belonging to family of whales or dolphins".

Whales, orcas and other dolphins are an important part of culture for many Indigenous peoples around the world. Orcas and whales are seen in belief systems, symbolism, art and storytelling from Polynesian peoples, Inuit peoples in Canada, Alaska and Northern Europe, Native American peoples in North America, Maori peoples in New Zealand and Aboriginal peoples in Australia.

Look up some stories, myths, beliefs and Dreaming stories about whales, orcas and dolphins from First Nations cultures around the world. You may like to find out more about these examples:

The Whale's Awakening, why the whale swims up and down the East Coast



The Kohola (whale) in Hawai'i

Old Tom and the Whalers of Eden, NSW.



Whales as kaitiaki (guides) in Maori traditions

Natsilane, the Native American Tlingit Legend



Cooperative fishing between Aboriginal people and dolphins

Kwakiutl belief of hunters turning into Orcas



The Maori legend of Paieka, the Whalerider





- AQUACULTURE
- BIOTECHNOLOGY
- BLUE WHALE
- CLIMATE CHANGE
- DEEP BLUE
- ECOTOURISM
- EXPLORATION
- FISHERIES
- INNOVATION
- MARITIME SAFETY
- NATIONAL SCIENCE WEEK
- OCEANOGRAPHY
- POLLUTION
- SEABED
- SOLUTIONS
- SUSTAINABILITY
- UNDERWATER

M O D H Y D R G V C S T Q M W N E E B R V R C C Y U Z Y
B D E V C I L O K P J A H S G Q F M C J E P L D G I S
L T E B R G J S P U M Q F H J S K E U B A D I E B W U
U Y O I U W J F B E N A K E P R B M R I H O M E Y C S
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E C O T O U R I S M E A M O P N T M C N F M A C G W B
A I B I I B T E R I R P O R O Y H E N O W S N D V R I
D F H O L U A S W O D W L K L T W S R L N Y G J E B L
F P Y N L Q C N L E R M V E L E J A V O I T E Z G N I
T E K O R E I P B P R E W J U N T F W G A B X E I T T
H W S T P S X A Q U A C U L T U R E U Y M I F P S H Y
J H W E I E E U J A D J K W I L V T B P E H V A I W C
E J T S O S B M W Y T P L A O C H Y H Y D R G V C S A
F T N A T I O N A L S C I E N C E W E E K Y P L X B M





Plastic pollution is a major issue for the ocean and the animals who live in it. Microplastics and macroplastics are eaten by fish, turtles, dolphins, seahorses and birds, causing them to become sick and sometimes die. In the box below, design something that can help detect, remove OR prevent plastic from getting in the ocean. *Don't forget to design a logo tool*



DID YOU KNOW

Microplastics are pieces of plastic smaller than 5mm, and macroplastics are pieces of plastic bigger than 5mm.





YOUR LOCAL SUPERMARKET IS LOOKING FOR SOMEONE TO CREATE NEW ENVIRONMENTALLY FRIENDLY SHOPPING BAGS TO SELL AT THE STORE AFTER FINDING OUT ABOUT HOW MUCH RUBBISH IS BEING DUMPED IN THE OCEAN EVERY YEAR.

Use the space over the page to draw your design.....

Design a new environmentally friendly shopping bag:

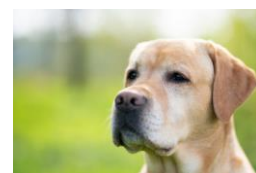
- What **colours and designs** will you put on your bags to make them appealing to shoppers?
- What **materials** will you use to create your bag that are both environmentally friendly and strong enough to carry items?
- How will you put your bag together for ease of carrying (E.G. will you sew your bag together)?
- **Make a video** for a TV ad, advertising your bag and explaining why you believe that shoppers should purchase one. How will you make your ad catchy and memorable (perhaps think of a song or a poem as part of your ad!)?
- How much will it **cost** to make the bags each? How much will you sell them for (and will you make any profit from your sales)? How much money could you make in a year if you sold 10 bags per day to customers?

DID YOU KNOW

8,000,000 tonnes (that's 8 million!) of plastic is dumped in the ocean every year.

This is equal to 21,917 tonnes of rubbish going into the ocean every day, or 913 tonnes every hour.

1 tonne = 1000 kg.
1 tonne = the same weight as 33 Labrador dogs.



8 MILLION TONNES
=

the same weight as 8 million giraffes.



the same weight as 53,333 Blue Whales.



the same weight as 470,588 buses...
OR 1,289 buses going in the ocean every day...
OR 54 buses going in the ocean every single hour!!





Your bag design

A large, empty rounded rectangular area outlined in blue, intended for a child to draw their bag design.



What lurks below.....

There are **28, 450 known species** in the ocean, but **2 million more that are a total mystery!** Scientists think that 91% of ocean species are yet to be classified! This means there may be plants and animals in the ocean that look nothing like the ones we already know.....

DID YOU KNOW
More people have been to the surface of the moon than the bottom of the ocean!

Design and draw a brand new species in the ocean.

You might like to research animals like these:

Frilled Shark



Vampire Squid



Giant Isopods



Giant tube worms



Gulper eel



Blob fish



Sea pen



Coelacanth



How long is it (metres)?

What food does it eat?

What special features does it have to be able to survive in the ocean?

What ocean creatures like to eat it?

What does it look like?



Draw and describe your new species!



Research the size of a Blue Whale

Scientific name: _____

Length (m): _____ Weight (in kg): _____

Compare the Blue Whale to everyday objects!

A school bus is 12.5 m long. How many school buses make the same length as a whale? _____

The average height of a human **male is 1.7m** and **female is 1.6m**. How many males / females would it take to be the same length as a Blue Whale?

Males: _____

Females: _____



Measure the tallest person in your family. How many of them would it take to be the same length as the Blue Whale? _____

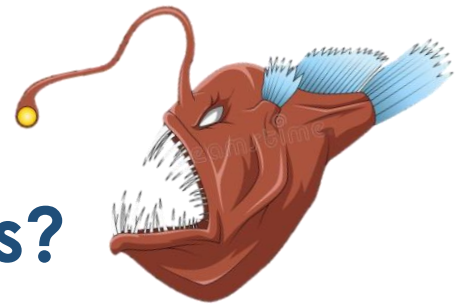
Challenge:

Australia is approximately 3860 kilometres (or 3,860,000 metres) long from its most northerly point to its most southerly point in Tasmania. How many whales long is this (in either kilometres or metres)?





What lives in the depths of our oceans?



Oceans hold up to **97% of the Earth's water**, that's around **1.35 BILLION TRILLION litres!** There are **five oceans across the planet**, and over **100 different seas!**

The ocean is divided into **5 different layers**, from top to bottom! These layers are called **ocean zones**. These zones are based on how far sunlight can travel from the ocean's surface. The zones are called; **Sunlight, Twilight, Midnight, Abyss & Trench.**

Watch 'How Deep Is The Ocean' to find out more about our oceans:
<https://thekidshouldseethis.com/post/how-deep-does-the-ocean-go>

Which zone gets the **most light** and which get the **least light**?

Most: _____

Least: _____

Can you find **two different species** that live in **each of the ocean layers**?

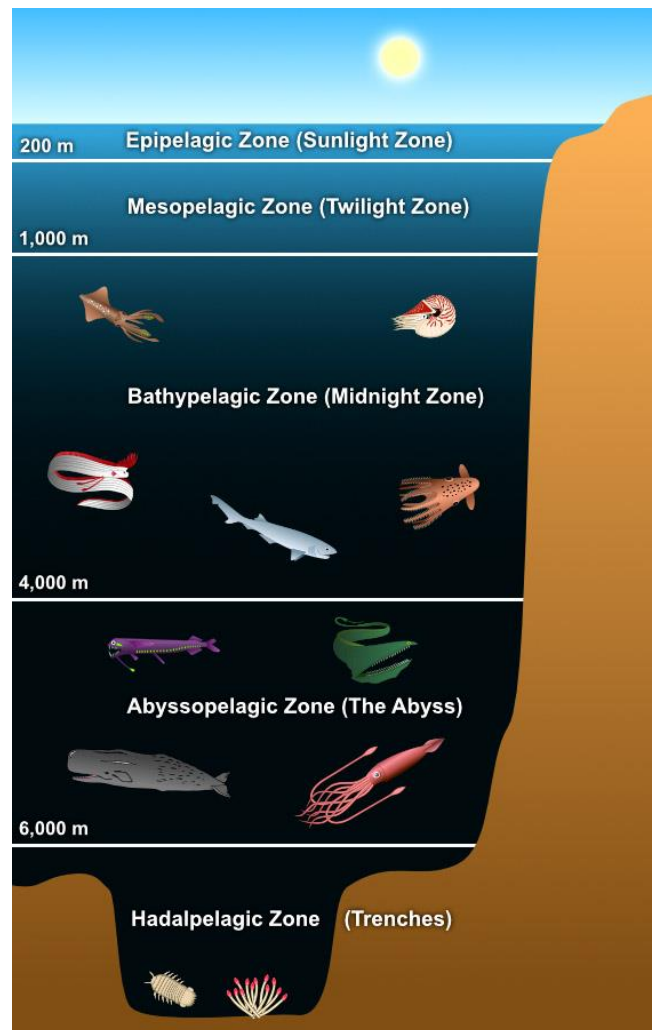
Sunlight: _____

Twilight: _____

Midnight: _____

Abyss: _____

Trench: _____





Make the ocean layers!

DID YOU KNOW

As the ocean gets deeper, it gets colder and has more pressure. The change in temperature and pressure means that fish and plants have had to adjust to living in those conditions. The bottom of the ocean is nearly freezing!

For this activity you will need:

- Empty toilet paper roll
- Colouring pencils
- Blue textas or paints (5 different shades)
- Scissors
- A4 piece of paper
- Glue

1. Using the blue colouring textas, colour the toilet paper in 5 different sections like the photo below.
2. Label each zone in the correct order (from top to bottom) next to a different shade of blue – **Sunlight, Twilight, Midnight, Abyss and Trench**
3. On the white paper draw the ocean species you listed from above.
4. Once you have finished cut and paste them into each of their zones.
5. Don't forget to take a photo or bring it in to your CU coordinator!



You may like to use this Ocean Zones poster by Rie Koishi to help you draw the animals! Follow the link or google "A2 Ocean Zones Poster"

https://i.etsystatic.com/20535210/r/il/03c13f/1931376232/il_1588xN.1931376232_o8e7.jpg



The Arctic Ocean

The Arctic Ocean is located in the **Northern Hemisphere** and is closest to Russia, Norway, Iceland, Greenland, Canada, and the United States (Alaska). And yes, it's also home to the **North Pole**! The Arctic Ocean is the smallest of the world's five oceans, the shallowest and the coldest. It is covered in ice all winter long!

Can you circle which 5 animals you think would call the Arctic Ocean home?



Polar bears



Seals



Arctic foxes



Dolphins



Crocodiles



Turtles



Walruses



Whales

Fill in the blank with the words below!

Drifting Sea Ice

Midnight Sun

- 40 degrees Celsius

Polar Night

50%

- The Arctic Ocean is almost entirely covered induring the winter
- In summer per cent of the Arctic Ocean remains frozen
- Temperatures in the Arctic can reach as low as.....
- In the Arctic, there are periods of at least 24 hours when the sun doesn't go down. This is called
- In the winter, there are also periods of at least 24 hours during when the sun doesn't rise. This is called



DID YOU KNOW

The North Pole has 163 days of total darkness (polar night) and 187 days of midnight sun each year. Midnight sun means that the sun doesn't set AT ALL for 24 hours!

If the arctic is so cold how do animals stay warm? Let's find out.

What you need:

- large bowl filled with ice water
- sticky tape
- butter – 5 tablespoons
- spoon
- zip- lock bag

1. Place your bowl with cold water and ice next to you.
2. Using the spoon, add 5 tablespoons of butter into the zip-lock bag.
3. Next place one hand into that bag and massage the butter so that it is spread evenly over your hand. **Don't take your hand out of the bag!** This is your **blubber glove**.
4. Make sure the bag stays secure by taping the zip-lock bag around your wrist.
5. Stick your bare hand into the icy water first, to get an idea of how cold the water is. Then stick your covered hand with the new blubber glove into the water bowl of water.

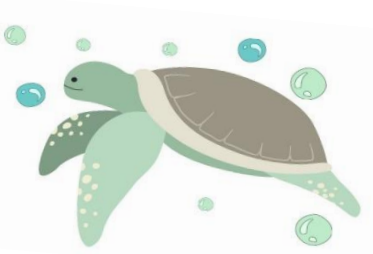
Did your two hands feel the cold water differently? What was different?

You'll notice that the 'butter glove' doesn't feel as cold. This is because butter is similar to polar species blubber that keeps them warm!





Sea Turtles



There are seven species of sea turtles: **Green Sea**, **Olive Ridley**, **Hawksbill**, **Flatback**, **Loggerhead**, **Kemp's Ridley** and **Leatherback**. Sea turtles spend their whole lives in the ocean, **except for when they hatch on the beach or come back to lay their eggs.**



Turtles are fantastic swimmers, and can hold their breath for **five hours underwater**.
Sea turtles can live to **be 100 years old and some even grow to be 700kg!**
Sea turtles are different to other types and **can't** hide in their shells.

Turtles are known as the ocean's lawn mower because they eat seagrass. **Look up some other things that sea turtles eat and write or draw them below:**

DID YOU KNOW

Sea turtles are a species of marine reptile. Sea turtles have been around for 110 million years, that's since the dinosaurs!



DID YOU KNOW

Female turtles return to the beach they were born to lay their own eggs. They can lay up to 100 eggs in each clutch!



Look at the pictures above:

- What do you see? _____

- Why do you think that Sea Turtles mistake jellyfish for plastic bags or balloons? _____

- Why is it dangerous for Sea Turtles to eat plastic that is in the ocean?

Some of the ways plastic affects sea turtles:

- Sea turtles confuse plastic bags for jellyfish and will often eat the bag, which gets stuck in their stomach
- Adult sea turtles in many places need to crawl through plastic waste to find a place to nest and then hatchlings can also get caught in the debris trying to make their way to the ocean
- Turtles can get stuck in plastic debris, e.g. fishing lines, while swimming. Many turtles make long journeys to migrate and pass through areas with a lot of ocean plastic.
- Helium balloons that burst look like jellyfish. These balloons can travel hundreds of miles in the air and land in rivers or the ocean and eaten



PLASTIC IN THE SEA...

WHERE IT SHOULDN'T BE

Create an art work that you can display in your school that raises awareness of plastic pollution in our oceans!

The art work must encourage friends, families and students to **USE LESS PLASTIC**. You might challenge them to cut down on plastic use for **ONE WHOLE DAY!**

How can you use less plastic? Here are some ideas:

- Paper straws instead of plastic
- Reusable containers for your packed lunch
 - Reusable drinks bottles
- If you like ice-cream, have it in a cone, not a plastic cup
- Party bags – homemade treats instead of plastic toys

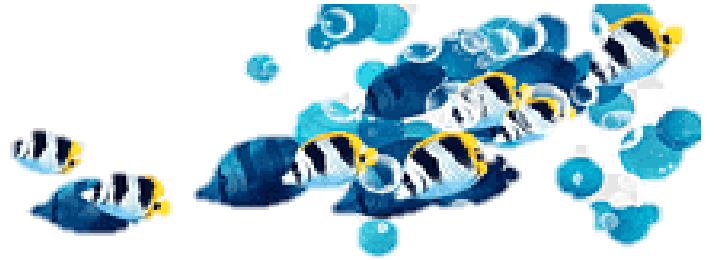
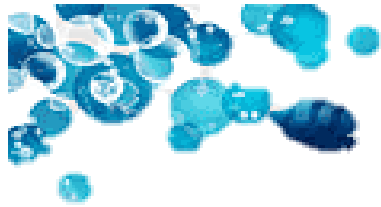
Your art work could be:

- A poster that shows the dangers to marine life...
- Leaflets or flyers that students can take home and share with their families and friends...
- A video telling your friends where can get help if they find an animal in distress...

HINT:

Find out more about your **local wildlife rescue organisations** and put their contact details on your art work so others will know who to contact for help with a sick, injured or stuck animal!





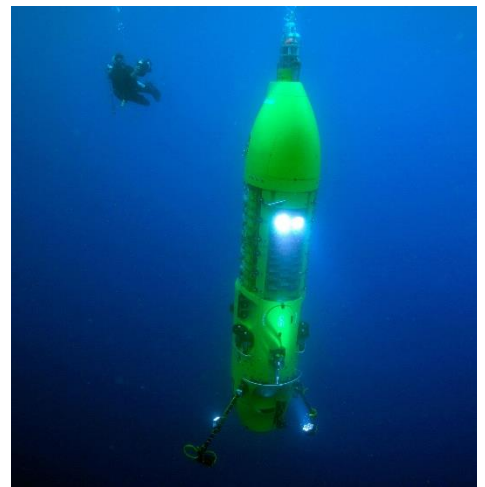
Under the sea

Much of the ocean is undiscovered but with **new technology** we are able to dive deeper and spend longer in the deepest parts of the ocean.



Dr Sylvia Earle and **James Cameron** are two people who have created **submersibles** which take people down into the deep ocean to study different species and their surroundings.

Follow this website to learn more about the **Deep Sea Challenger**. It has reached the bottom of the Mariana Trench!
<http://divemagazine.co.uk/kit/6723-10-facts-about-deepsea-challenger>



Follow this website to learn more about being a deep sea **submersible pilot!**

<https://www.nationalgeographic.org/article/deep-sea-submersible-pilot-erika-bergman/>

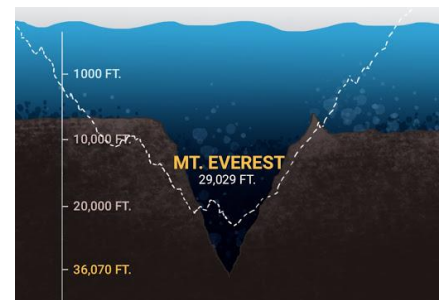
Pick one of these tasks to do:

- 1 **Design a new submersible** to dive down into the ocean. Give your invention a name and describe how it works.
- 2 **Write a song or poem** about what you might see around you if you were on the bottom of the ocean, or how it might feel to be there with new undiscovered species. You can add drawings or create some music too!



DID YOU KNOW

The deepest part of the ocean is the Mariana Trench. This trench is deeper than Mount Everest is tall. Mount Everest is 8848 metres high, and the Mariana Trench is 11034 metres deep! Watch this video to see how deep that really is! <https://www.youtube.com/watch?v=Y2tm40uMhDI>





Design your own submersible, or write your own song!



People use the oceans now more than ever in history. We have ships and boats for transporting people, transporting items, military use, and for leisure and fun!

Ocean vessels, lighthouses and ports use signal flags to communicate with each other. The International Code of Signals is used by most people. Each flag has a different meaning, and combining two flags will mean something different again.

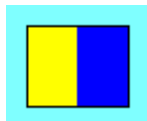
These are some examples of Signal Flags:



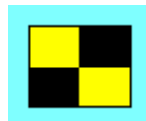
C – Charlie - affirmative / yes



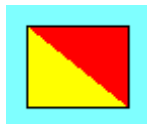
N – November – negative / no



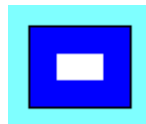
K - Kilo – I wish to communicate



L – Lima - you should stop



O - Oscar- man overboard



P – papa- the *Blue Peter* - all aboard



Y – Yankee - I am dragging my anchor



Z – Zulu – I require a tug

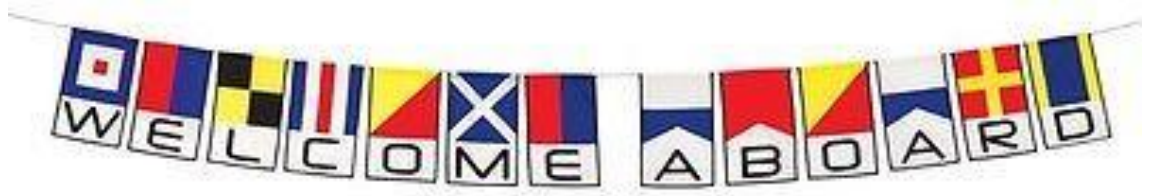
DID YOU KNOW

A ship with all of its signal flags hoisted is called “dressed overall”. This is done as a celebration!



Use the template on the next page to create your own **Signal Flags** for your house, family, class or friend group! You can use the International Code of Signals to get some ideas.

You might like to create a flag that means “dinner time”, “I am taking the dog for a walk”, “it’s raining”, “the footy is on”, “my homework is finished”, “it’s my birthday”



Make a marine animal and habitat card game!



Look at the habitats on this page. Find out **one** animal that lives in **each different** environment. That will be **12 different animals!** On the next page, **write** or **draw** each animal that lives in the habitats, so you have a set of animal cards and a set of habitat cards!

Kelp forests



Anemone



Seafloor



Coral reef



Open ocean



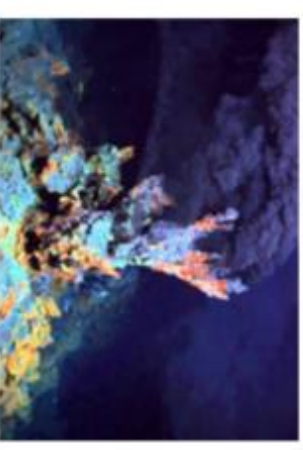
Lake / Estuary



Iceshelf - Northern Hemisphere



Hydrothermal vents



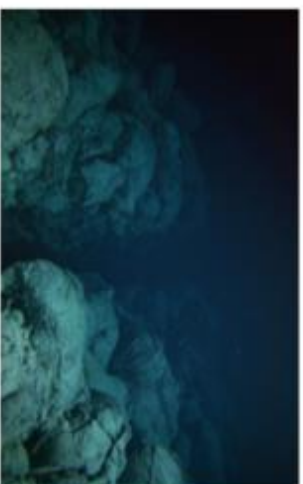
Iceshelf - Southern Hemisphere



Rock platform



Trench



Seagrass beds





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BACK OF CARDS



Cut out the cards and test your family and friends! Show them all the cards and see if they can match the animal to the correct habitat! Remember to write down which animal goes with which habitat somewhere else so you can tell them the right answer. You could make it two animals per habitat for a challenge!





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BACK OF CARDS