Ocean Wonders Toolkit

Kindergarten & Early Years

MUSEUMS VICTORIA

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Ocean Wonders Toolkit – Post Visit Resource

How to use this resource

This post visit resource has been developed exclusively for educational purposes by Museum Victoria's Outreach Education Team.

Teachers are encouraged to:

- Download and use this resource to engage and inform learners
- Differentiate and make any adjustments to the learning resource for the needs of your students
- Use this resource as a unit of learning or to compliment an existing unit of learning
- Print out and distribute any activities and slides for your colleagues and students
- Facilitate further learning and explore resources via the links provided

Note:

- Curriculum links to the VEYLDF can be found on slide 35 and suggest some ways this content can be aligned to your environment.

What Ocean Wonders did you discover during your session?

What items did you see when the museum visited your classroom?
Can you **name** the above four items?

What Ocean Wonders did you discover during your session?

Did you name them all correctly? See the answers below:

Tiger Shark Jaw

Animal Type: Fish
Diet: Carnivore

Eleven-Armed Sea Star

Animal Type: Echinoderm (Invertebrate)
Diet: Carnivore

Blue Whale Vertebra

Animal Type: Mammal
Diet: Carnivore

Green Sea Turtle

Animal Type: Reptile
Diet: Herbivore (Adult)

What does it mean?

When introducing the different animals of the sea, we will include words such as *carnivore.*
But what does that mean?

What kind of food an animal eats is called their diet.
There are **three** different classifications for diet.

They are **carnivore, herbivore** and **omnivore**.

These classifications are used for **every** animal. Even you!
Let's find out what they mean.

But first let's take a guess – what food do **you** think each one eats?

What does it mean?

CARNIVORE	HERBIVORE	OMNIVORE
only eats **meat**	only eats **plants**	eats both **meat** and **plants**

An easy way to determine what an animal eats is to look at their teeth.

If they have sharp teeth, they are likely a carnivore as they need the sharp teeth to catch and chew their food!

If they have flat teeth, they are likely an herbivore as plants are softer to chew.

See this shark tooth – would you say it is **sharp** or is it **flat**?
Do you think a shark is an **herbivore**? Why or why not?

Now it's time to learn more about the animals you may have seen during our visit to your classroom. Don’t forget to take note of their diet!

Meet the Tiger Shark

They are called a Tiger Shark because of their tiger-like stripes, but these stripes fade away as the shark gets older.

All sharks, including our Tiger Shark, have the ability to regrow their teeth – a single shark might grow thousands of teeth over their lifetime!

Tiger Sharks are known for their unfussy appetites, and have been found to swallow objects like plastic, car tyres, and even licence plates.

Tiger Sharks can live for over **30** years.

- **Diet:** Turtles, sea snakes, crustaceans, cephalopods, smaller fish
- **Habitat:** Tropical waters
- **Status:** Near threatened
- **Animal Group:** Cartilaginous Fish

Meet the Eleven-Armed Sea Star

One of the largest Australian sea star species.

Even though this sea star is called the Eleven-Armed Sea Star, they can actually have anywhere from 7 to 14 arms. Sometimes this sea star will intentionally lose an arm to escape a predator –but they can regrow their arm back within 6 months!

Just like all sea stars, the Eleven-Armed Sea Star does not have a **brain**. They instead have a nervous system that functions similarly to a brain; coordinating its movements in response to stimuli such as light, sound or smells. Sea stars also do not have **blood**! They instead use water to pump nutrients through their body.

- **Diet:** Small crabs, marine worms
- **Habitat:** Rocky shores and coastal waters in southern Australia
- **Status:** Unknown!
- **Animal Group:** Marine Invertebrates

Meet the Blue Whale

The Blue Whale is the biggest animal that ever lived, measuring 30m long and weighing up to 200 tons.

Despite their size, they eat some of the smallest creatures in the ocean, krill.

Blue Whales do not have teeth.
Instead, they have baleen bristles
(long and wire-like structures) in their mouth
to trap tiny krill and filter out seawater.

A blue whale needs to eat 3,600kg of krill every day!

After eating, the whale's poo becomes a nutrient rich fertiliser which feeds phytoplankton. And then phytoplankton feeds the krill which creates a cycle of life.

Whale poo is very important to the health of the ocean!

- **Diet:** Krill
- **Habitat:** Coastlines and open oceans
- **Status:** Endangered
- **Animal Group:** Marine Mammal

Meet the Green Sea Turtle

An adult Green Sea Turtle is a strict herbivore.
But when they are young they have a carnivorous diet, eating animals such as jellyfish!

And because adult turtles eat so much green food, the fat inside their body becomes green – which is where their name comes from.

They spend their whole lives at sea, coming back to land only to lay their eggs. A mother turtle will actually remember the beach she was born on and will go back there to lay her own eggs.

Turtles are a reptile which means they have lungs and cannot breathe underwater. They must return to the surface every half hour to breathe. But when they are sleeping, they can stay underwater for several hours before resurfacing for air.

- **Diet:** Sea grass, algae
- **Habitat:** Tropical oceans in the Indo-Pacific region
- **Status:** Endangered
- **Animal Group:** Marine Reptile

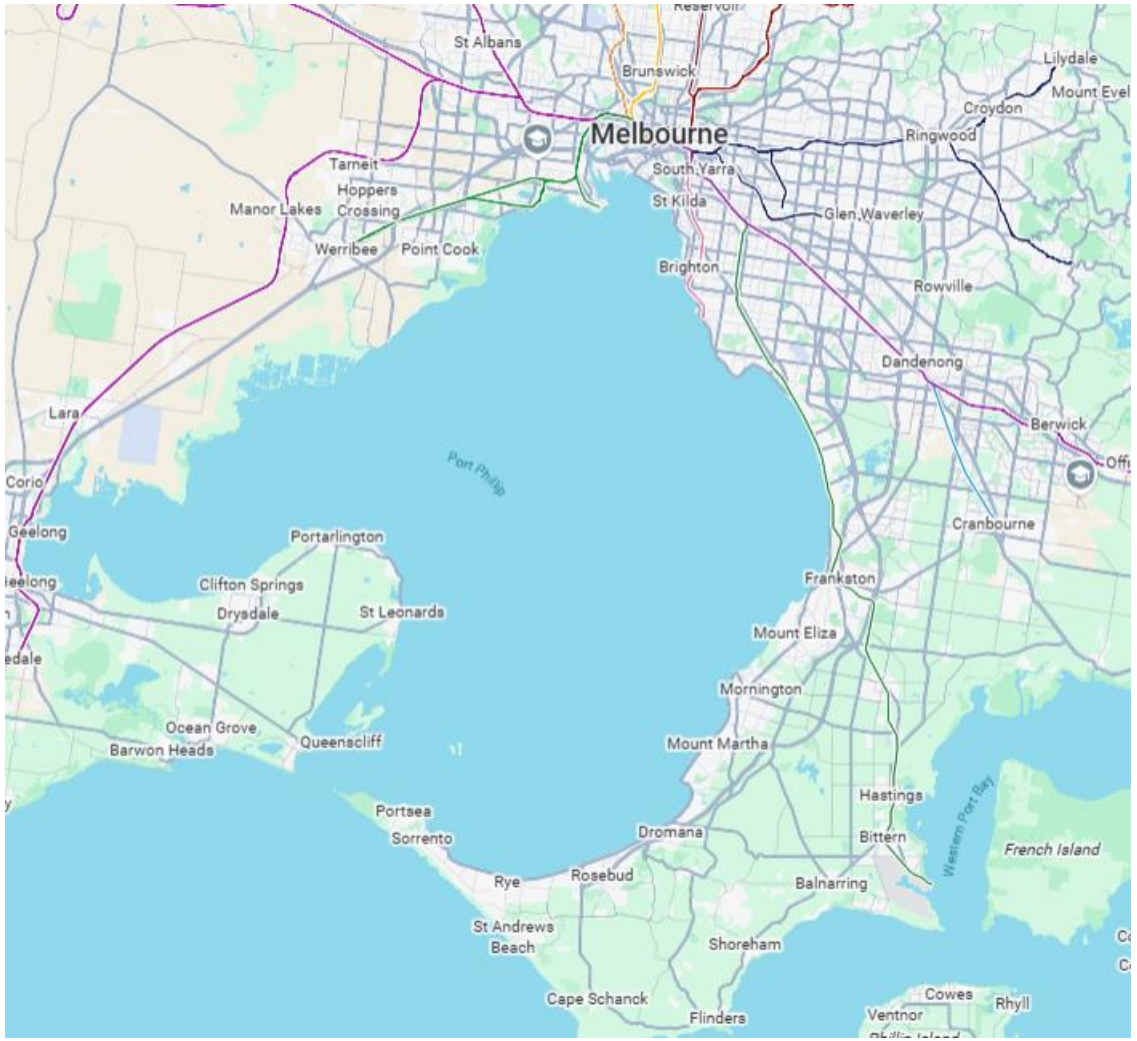
Port Phillip Bay

Have you been to the ocean or visited a beach?

If you live in Victoria you may have visited **Port Phillip Bay**. Shaped like a horseshoe, Port Phillip Bay is a large body of water that is found at the bottom of the southern part of Victoria.

It is rich in marine life and is home to many animals, such as hundreds of fish species, jellyfish, crustaceans, seaweeds and more.

Can you see your suburb on the map?
Do you **live** close to the bay?



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What animals can you find at Port Phillip Bay?

The **Weedy Seadragon** can only be found in Australia's temperate marine waters and is a close relative to the seahorse – they are both a type of fish!

The Weedy Seadragon has leaf-like appendages on their body that resemble kelp or seagrass which helps the seadragon **camouflage** itself from predators. You will likely find the Weedy Seadragon swimming amongst kelp-covered rocky reefs and seagrass meadows.

Have a look at the picture of the Weedy Seadragon.

Can you find the tail on the picture of the seadragon?
Can you find its snout?
What colours do you see?

Can you **draw** your own Weedy Seadragon?

What animals can you find at Port Phillip Bay?

The **Port Jackson Shark** can often be found on or near the bottom of the sea earning it the title of "bottom dweller".
It is here where the Port Jackson Shark finds most of its food;
it likes to eat crustaceans, molluscs, small fish and urchins.

This shark is **nocturnal** which means it is active during the night and asleep during the day. Can you think of another animal that is **nocturnal**?

While other sharks can have big sharp teeth, the Port Jackson Shark's teeth are very different. Here is a photo of this shark's bottom jaw.

How would you describe the teeth? Are they **sharp**? Are they **flat**?

This shark's strange teeth are perfectly designed to crush and grind hard shells – which is perfect for its diet!

What animals can you find at Port Phillip Bay?

You may have seen **Port Jackson Shark** eggs before –
as the empty seaweed-like eggs often wash up on the beach.

The mother shark will lay the eggs and then use her mouth to wedge them into the cracks of a rock, where they will stay for up to 12 months until the baby shark has hatched from the egg.

The empty eggs then may wash up on to the beach.

Have you seen this egg before?

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Further Study: can we breathe underwater?

Just like us, fish need to breathe.
And just like us, fish need oxygen to breathe.

The **difference** is that fish have special organs called gills – which are able to extract the oxygen from the water.
The water needs to flow through the gills for the fish.
If a fish is not in water, it is unable to breathe.

Humans **do not** have gills, so therefore we are unable to breathe underwater.
If we wanted to go exploring under the water, we would need special equipment to help us breathe: such as an oxygen tank.

This is especially important if we want to swim deep down in the Ocean – but the deeper we go, the colder and darker it is, so we'd also need a googles and a wetsuit and flippers to help us swim!

Have you used flippers before? How did they help you swim?

What shell shapes have you found at the beach?

Every seashell you find was made by an animal.
Animals called **molluscs** have soft bodies, so they build a hard shell for protection – like growing your own armour!

Spiral shells were home to creatures who crawl along the sea floor




Flat shells protect creatures who like to stick really hard to rocks




Two halves of a shell used to have an animal living safely inside




All these shapes can be used by hermit crabs for homes, fish for laying eggs in, or octopus to hide in!
Let's leave them on the beach.

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What animal is living inside?

Can you guess which animal might...

... like to crawl along the sea floor?




... like to stick to rocks and to walls?




... like to stick to rocks and to walls?




Find a possible **answer** on the next page...

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Did you guess correctly?

Can you guess which animal might...

... like to crawl along the sea floor?

Sea Snails!

... like to stick to rocks and to walls?

Abalones!

... like to lie tucked away inside?

Clams!

Did you guess correctly?

Activity: Mix and Match

These animals all have shells – can you draw a line connecting the picture with the right animal's name?

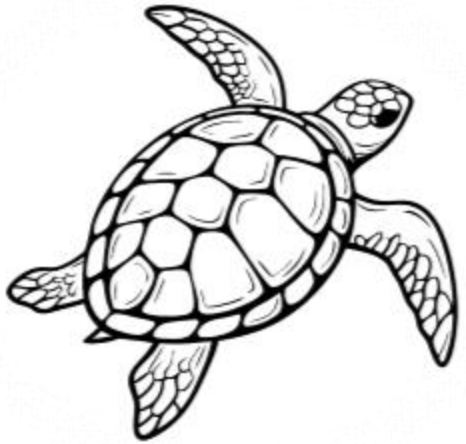
Clam

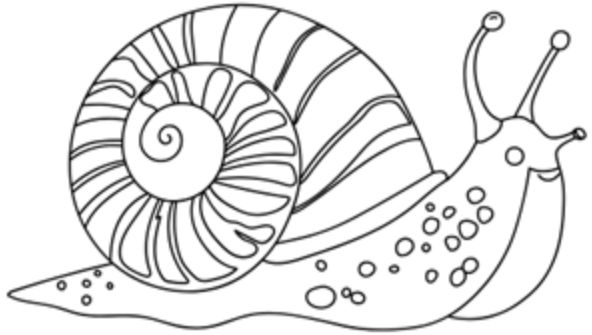
Sea Snail

Crab

Sea Turtle

Scallop





Once you are finished don't forget to colour in the animals!

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A further study: Ocean Zones

When we visited your classroom
we explored
three different layers of the ocean.

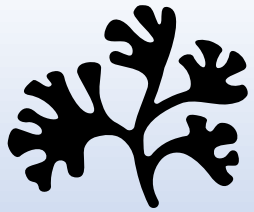
Do you remember the name of the layers we explored?

That's right!

The Sunlight Zone
The Twilight Zone
The Midnight Zone

But did you know there are actually five layers?

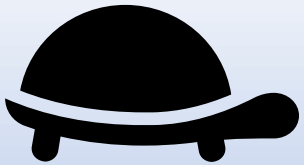
These layers are called zones.
They are defined by the amount of sunlight that travels to them from the surface.



Sunlight Zone (surface – 200m)

This zone gets **heat** and **light** from the sun.

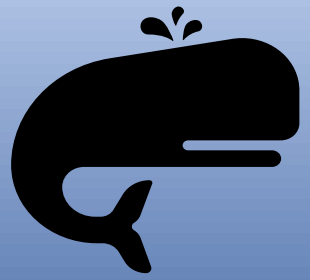
Because of this, plants (like algae) and microscopic species (like plankton) thrive here!
These species are important because lots of other animals will feed on them,
and so we can find most ocean plants and animals here.



Twilight Zone (200m – 1,000m)

This zone is **cold** and **dark**. It does not get much light.

Plants need sunlight to photosynthesize, so almost none grow here.
Some of the animals here make their own light, which is called bioluminescence.



Midnight Zone (1,000m – 4,000m)

This zone does not get any sunlight and is **very** cold.

The only light comes from bioluminescent animals.
Bioluminescence helps animals find food, attract mates, and scare off predators.
The creatures who live down here can't afford to be picky eaters.

Abyssal Zone (4,000m – 6,000m)

The water down here is nearly **freezing**.

The weight of the entire ocean above you is so heavy: the pressure would be the same as if an elephant stood on a single postage stamp.
There are no plants, but we can find underwater bacteria growing on underwater vents – this is the deep-sea version of photosynthesis.

Hadal Zone (6,000m – 11,000m)

This zone is mostly **deep** ocean trenches.

The deepest trench, the deepest part of the whole ocean, is called the Mariana Trench.
It's almost 11km deep – that's deep enough to fit Mt Everest!
The Hadal zone is the least explored habitat in the world.
There are likely animals living here we haven't discovered yet.

I wonder what else can be found down here…

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Activity: Ocean Zones and Animal Homes

Can you figure out which Ocean Zone these animals like to swim in?

1.Print out this activity.

2. Cut out the ocean animals.

3. Stick them in their watery home on the next page.

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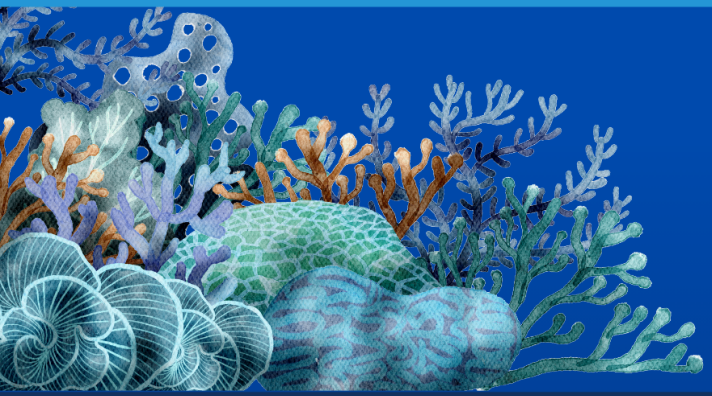
Hint: Find out whether the animal prefers to live in a **warm** *or a* **cold** *place!*

SUNLIGHT ZONE



TWILIGHT ZONE

MIDNIGHT ZONE

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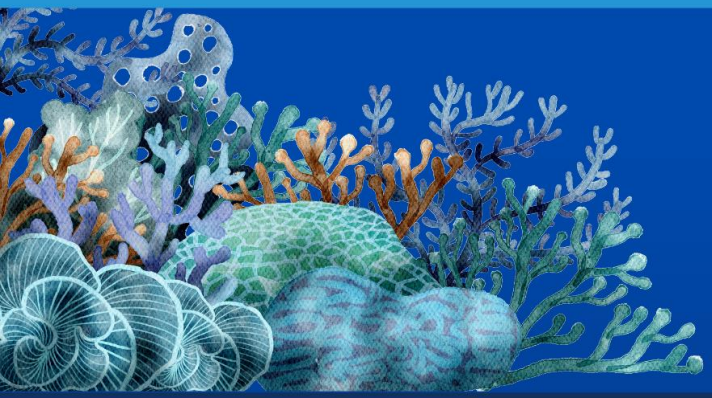
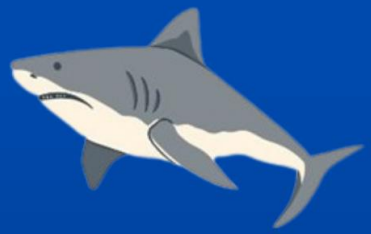
See the answers below.
Did you get them all correct?

SUNLIGHT ZONE



TWILIGHT ZONE



MIDNIGHT ZONE

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Amazing Discoveries from the Deep Sea

Scientists from the Museums Victoria Research Institute have been investigating the ocean floor on the *RV Investigator.*

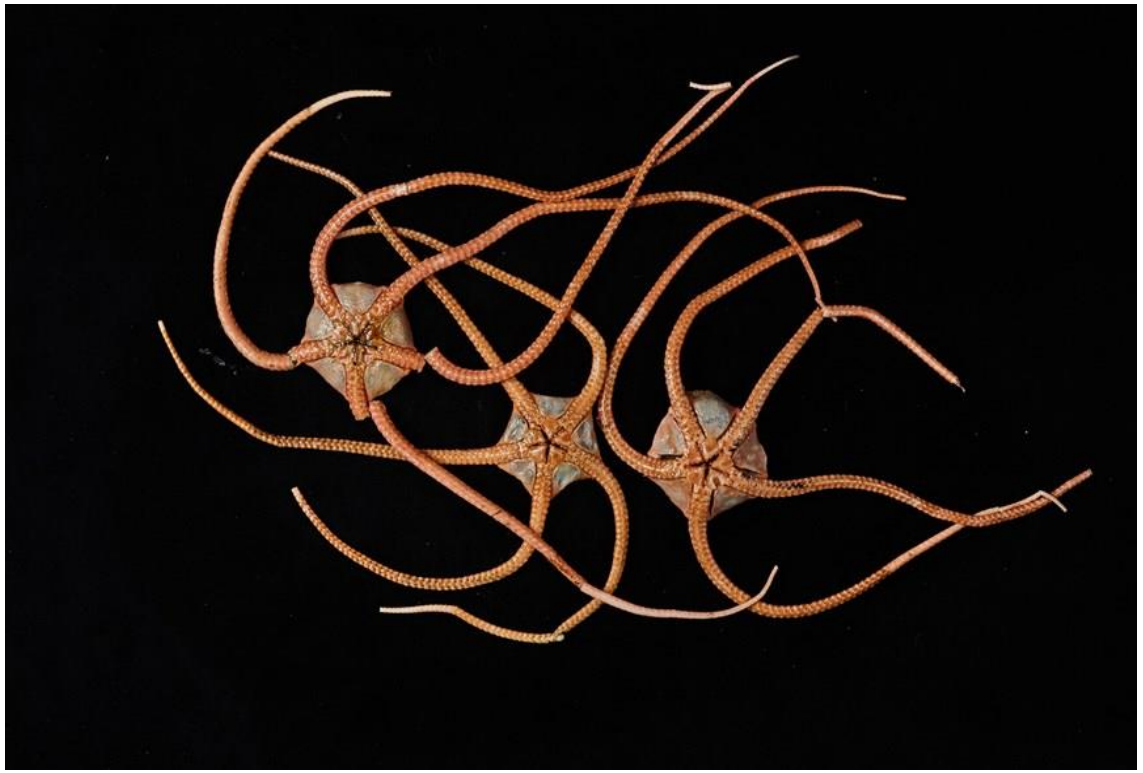
During their journey in Australia's unexplored deep-sea Indian Ocean, they discovered amazing new animals and huge underwater mountains!

You will see some photos of these deep-sea animals on the next page.

What do you **imagine** these animals might look like?

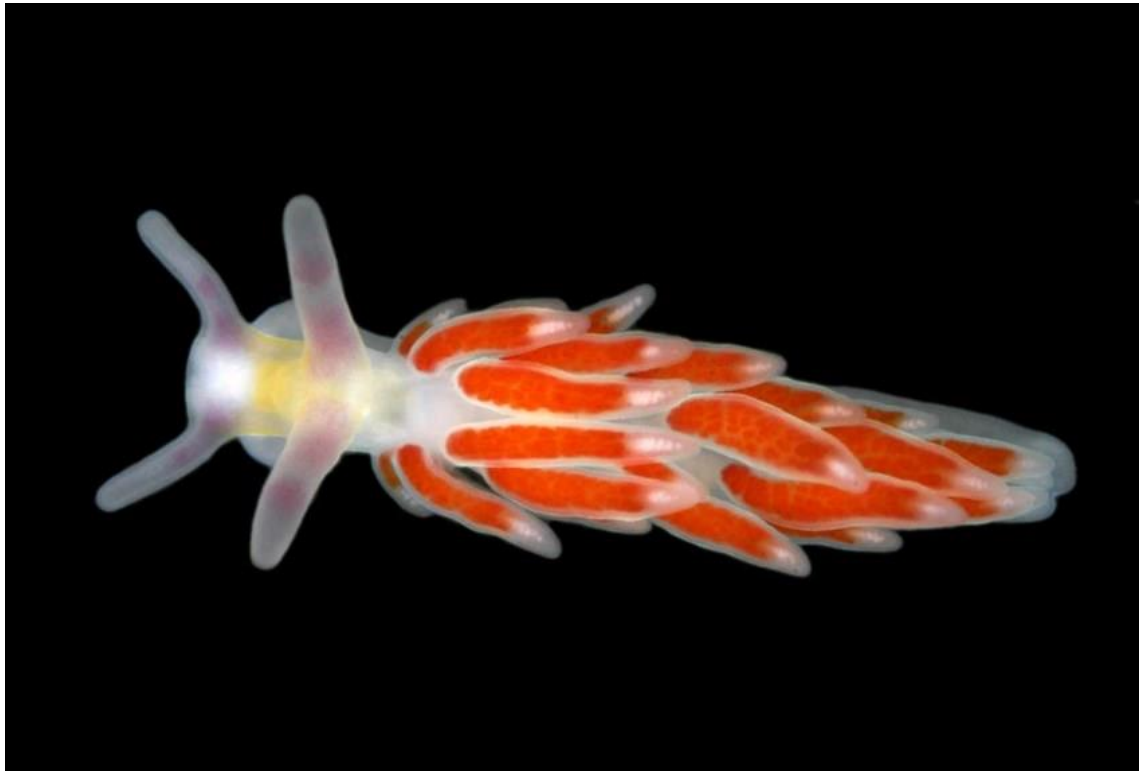
The *RV Investigator* docked in Darwin.

Amazing Discoveries from the Deep Sea



Brittle Star

Animal Type: Echinoderm
(closely related to Sea Stars)
Scientific Name: Ophiuroidea



Sea Slug

Animal Type: Marine Gastropod
Scientific Name: Trinchesia Sororum

Amazing Discoveries from the Deep Sea

Sandworm

Animal Type: Annelid
(Segmented Worm)
Scientific Names: Nereididae

Greeneye

Animal Type: Fish
Scientific Name: Chlorophthalmus

Amazing Discoveries from the Deep Sea

Want to learn more about these deep-sea discoveries? Watch these videos below:

Follow Dr. Tim O'Hara, Senior Curator of Marine Invertebrates at Melbourne Museum, as he boards the RV Investigator.

Click link to watch Investigating the deep-sea off Australia

See more astounding discoveries from the deep sea.

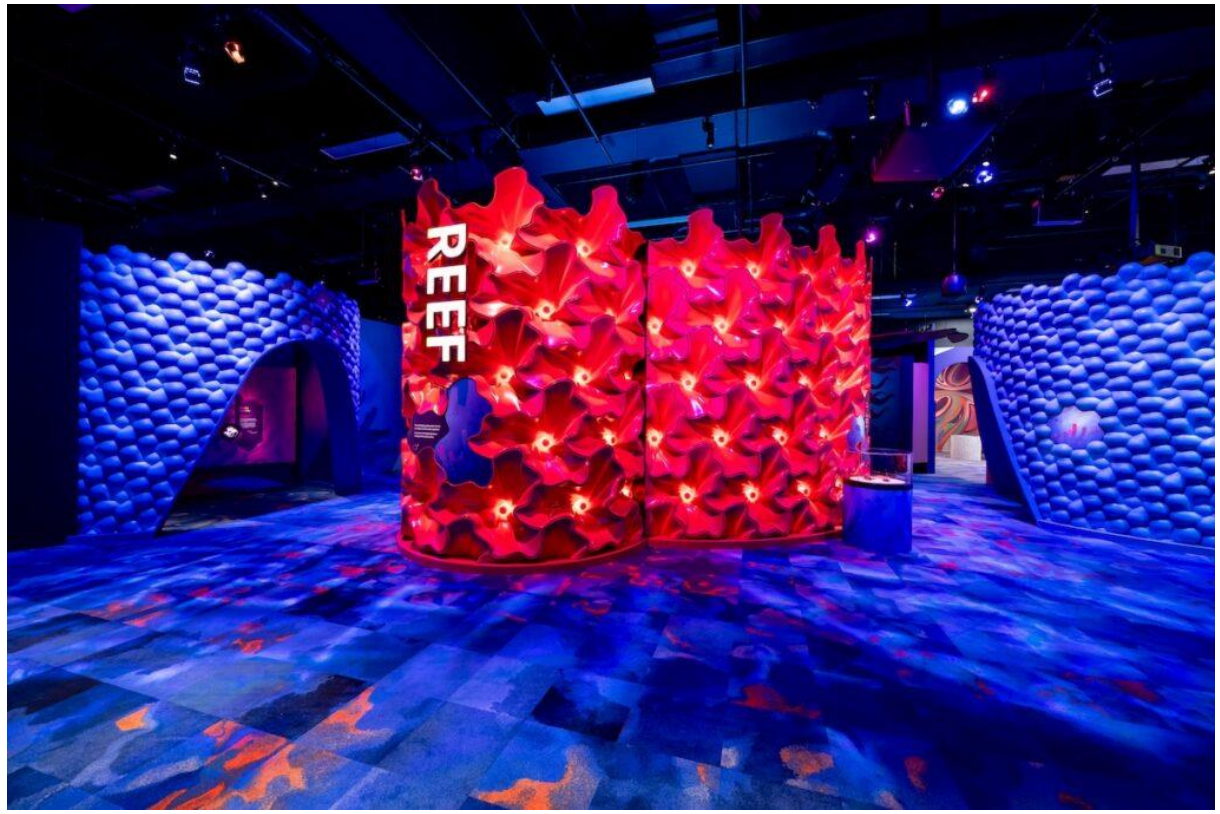
Click link to watch Astounding discoveries from the deep-sea

Our Wondrous Planet

If you would like to learn more about ocean life and its marine animals, you can come along to Melbourne Museum's exhibit *Our Wondrous Planet.*

This exhibit explores all the different ecosystems that house and connect the different animals from around the world.

Alongside learning about the microscopic creatures that live within our soil, and the keenly evolved animals that can only been found in arctic landscapes – you can learn about our aquatic ecosystem in **Reef.**



Reef takes you beneath the waves to a world teeming of life.

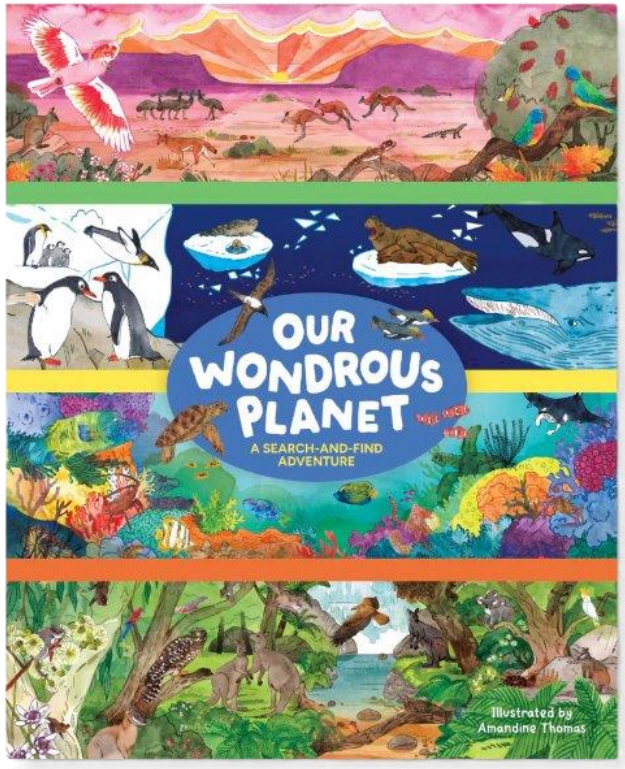
You can learn about the living coral that builds our reefs and creates homes for millions of creatures.

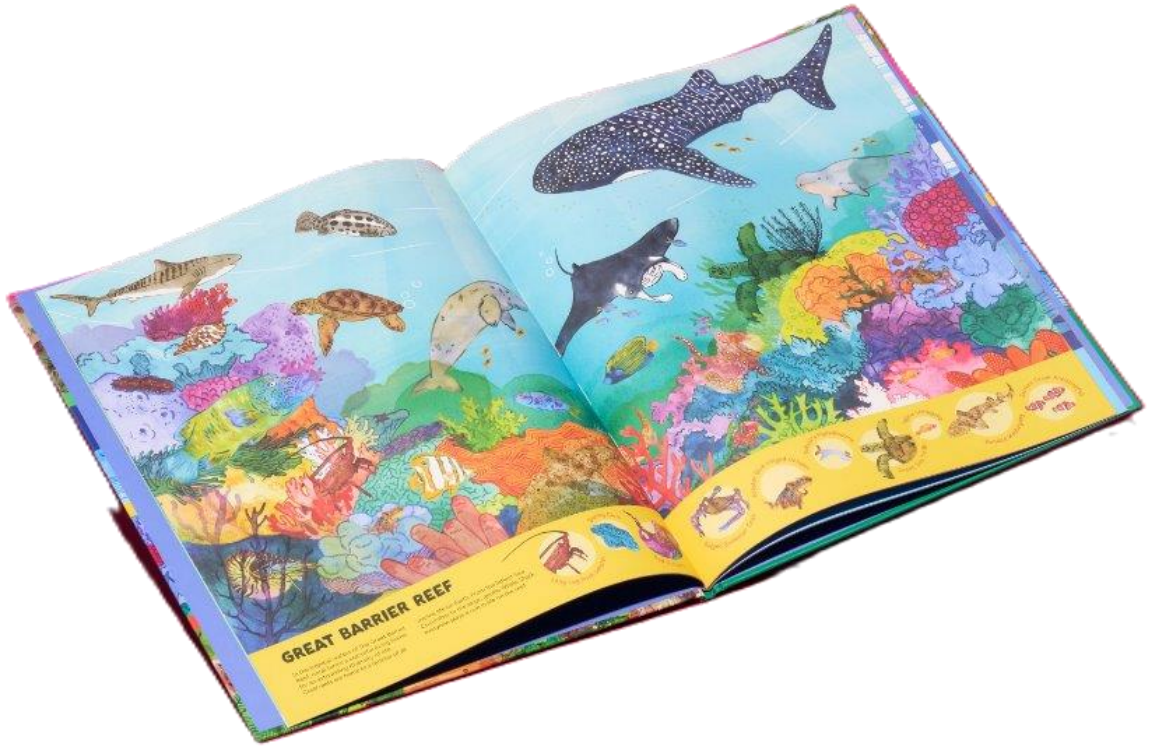
You can learn about how the smallest of plankton - as small as you can see! - does its part to make the ocean a home for all.

You can even learn more about the ocean creatures we've discussed in this resource!

Our Wondrous Planet

If you would like to learn more about our Wonderous Planet you can purchase the search-and-find adventure book from our Museum Giftshop.





Continue your learning journey with us...

LEARN

Your questions answered by our curators

Students have submitted questions to our marine scientists. Learn all about our oceans by watching their answers!

LISTEN

Mindfulness for kids

Let this video specifically designed for kids take you to the Great Otway National Park just off the Great Ocean Road in Victoria.

VISIT

What's On

Now that we have visited you, why don't you visit us!
Check out what's on at Melbourne Museum.

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Useful Links

1. Ask us - Museums Victoria

We can assist you with general research questions or provide access to museum expertise.

2. Professional learning for early childhood teachers - Museums Victoria

Museums Victoria offers free professional learning programs for educators and teachers using the VEYLDF within their service.

3. Museum Teachers - Museums Victoria

Museum Teachers is open to all Victorian teachers and educators to create the best learning outcomes through our museums.

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VEYLDF Links

- ✓ **4.3** Children transfer and adapt what they have learned from one context to another.
- ✓ **4.4** Children resource their own learning through connecting with people, places, technologies and natural and processed materials.
- ✓ **5.1** Children interact verbally and non-verbally with others for a range of purposes.
- ✓ **5.2** Children engage with a range of texts and gain meaning from those texts.
- ✓ **5.4** Children begin to understand how symbols and pattern systems work.

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Additional Activities

Please find additional activities at the end of our Post-Visit Resource to be used at your leisure.
These activities include educational links, STEM based experiments and colouring in sheets.

Contents for activities:

Page 31 ……. Additional Learning: Exploring the Ocean with ABC Broadcasting video link

Page 32 ……. Activity: *Where Does My Rubbish Go?* A mix and match activity

Page 33 ……. Activity: *Seashells on the Beach:* Colouring In Sheet

Page 34 ……. Activity: *Pygmy Blue Whale:* Colouring In Sheet

Page 36 ……. Additional Learning: Ocean Layers Density Demonstration

Page 37 ……. Additional Learning: Hot VS Cold Demonstration

You can find more early childhood STEM activities at our museums website by clicking the link here.

Exploring the Ocean with ABC Broadcasting

Click the link to watch the video (2 mins)

***"Explore the Ocean** with **ABC Broadcasting** as they walk along the beach and pick up polluting trash along the way.*

See the many amazing animals that live under the sea – fish, octopus, jellyfish and whales!"

This video is supplemented by the activity on the following page: *Where does my rubbish go?*

A mix and match activity that encourages learning about the different types of waste management. An important lesson to help keep our oceans clean from pollution.

Where does my rubbish go?

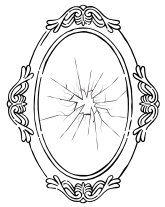
Help keep our oceans clean and our marine wildlife safe!
Cut out the different items and place them in the correct bin.

Newspaper

Milk


Plastic Cutlery


Banana Peel


Broken Mirror


Nappy


Plastic Bag


Apple Core


Flowers

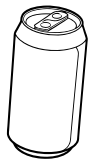

Sticks


Coffee Cup


Light Bulb


Wine Glass


Glass Jar


Soft Drink Can


Tin Can


Recycling


General Waste


Green Waste


Glass

Tip! Some items aren't able to be recycled in all areas, even if the label says so.
As a class search up your council's recycling guidelines to ensure you're putting the right items in the right coloured bins!

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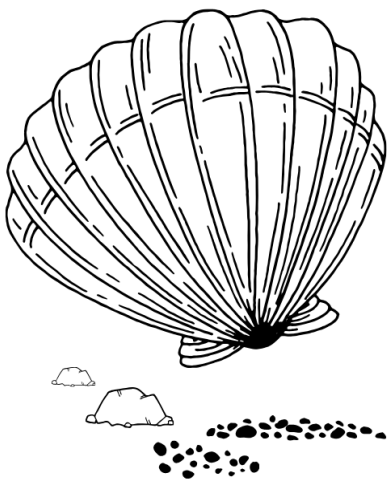
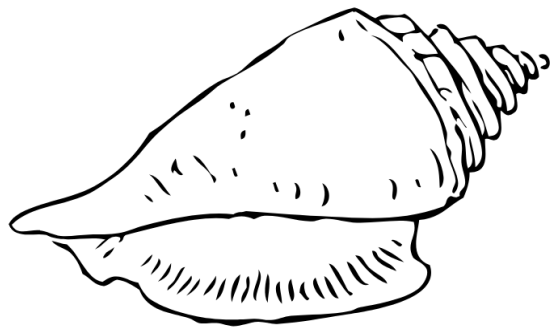
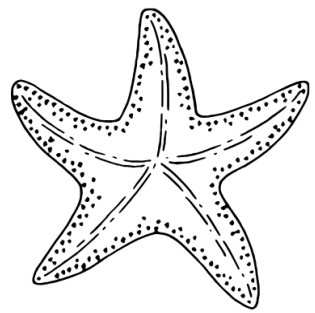
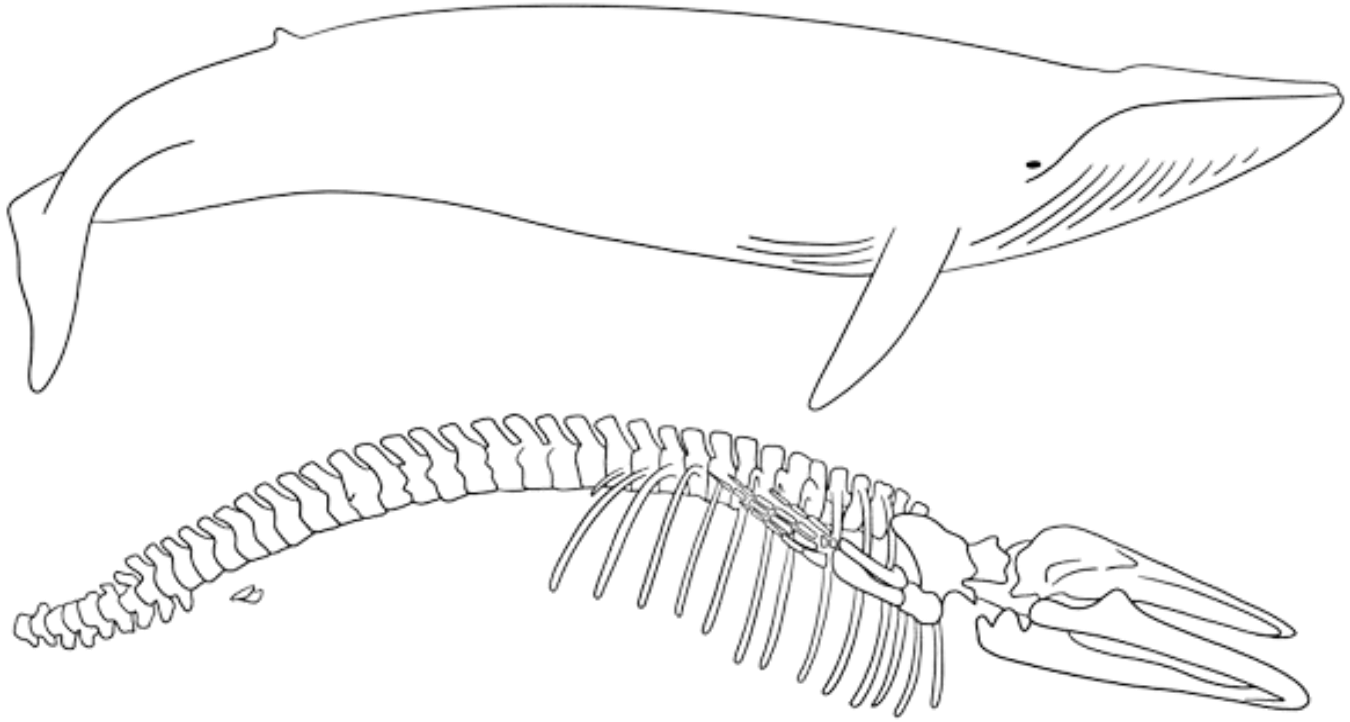






Pygmy Blue Whale

Find out about 10 other really big things in the Museums Victoria State Collection!



Size: 24 metres long

x 15

Weight: 90 tonne

Diet: Carnivore

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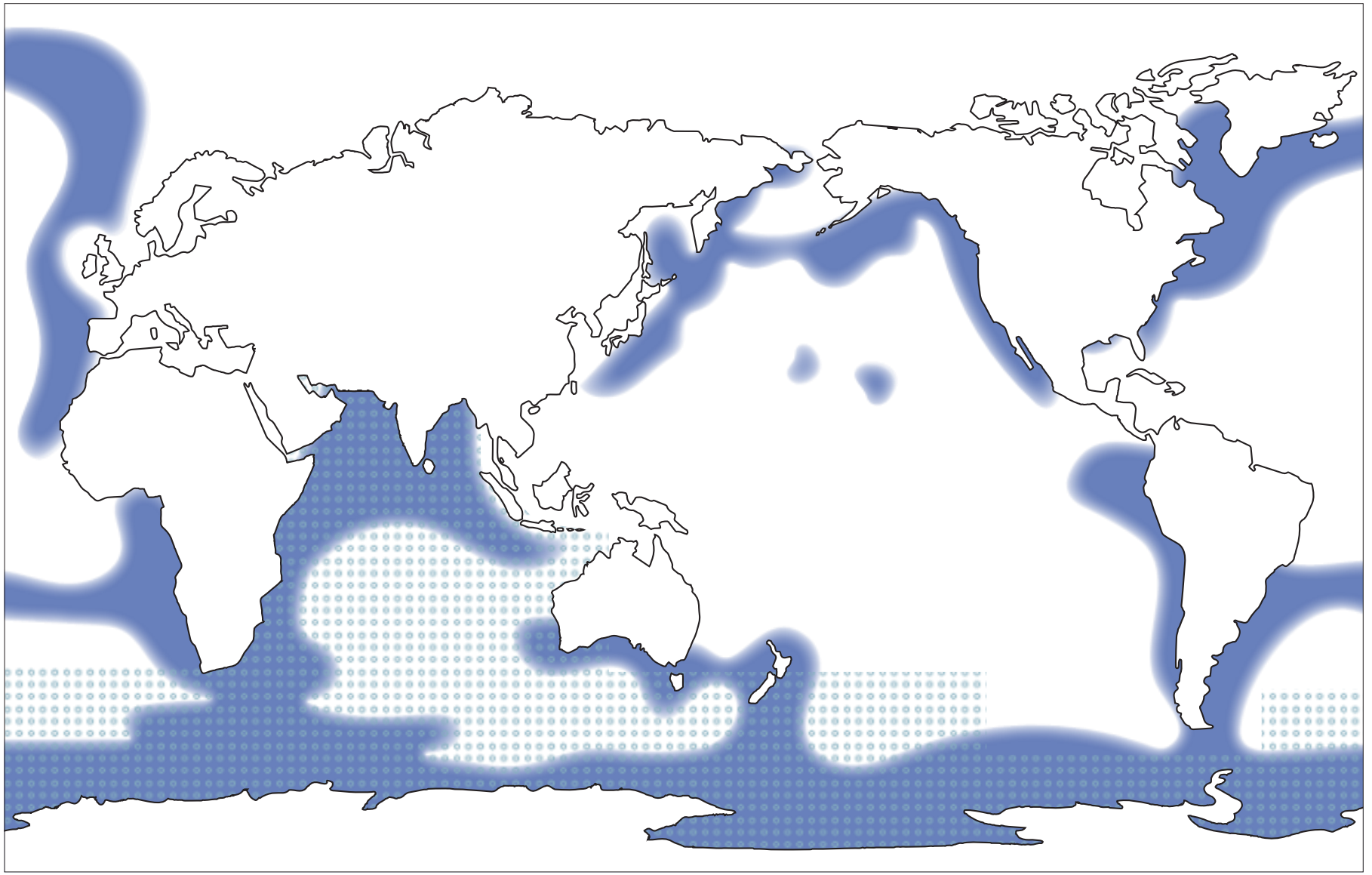

Pygmy Blue Whale

Habitat: Coastlines and open oceans, within sunlight and twilight zones

Whale protection sanctuaries

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Ocean Layers Density Demonstration

Explore the density of different layers of the ocean using everyday liquids!

Density is a word used to measure how much stuff there is in a certain space. Generally, things that are really dense feel heavy to us.

If a liquid sinks to the bottom it is **dense.** But if it floats to the top then it is not **dense**. Can you think of any thick and heavy liquids that might sink?

The layers in the ocean are also different densities.
The lower the zone, the more dense the water is.

For example, the **Twilight Zone** is more dense than the **Sunlight Zone**.

Can you guess which zone is the **most dense**?

Ocean Layers Density Demonstration

Instructions

Materials

- Glass Jar
- Food Colouring (blue and black)
- Water
- Oil
- Dish soap
- Maple syrup
- Honey

Method

1. Use the food colouring to make each liquid a different shade of blue.
2. As a class compare the heaviness of each liquid (i.e. is honey lighter or heavier than water?)
3. Add in the liquids from heaviest to lightest. It would be honey (Hadal Zone),
4. maple syrup (Abyssal Zone), dish soap (Midnight Zone), water (Twilight Zone) and lastly oil (Sunlight Zone).
1. Ask the class to name the zones in the correct order – did they get it right?
2. For an additional activity – drop items in to see if they sink or float?

Hot VS Cold Demonstration

We learnt that the **Sunlight Zone** is warm because it is heated by the sun. But as we get further down into the ocean it gets cooler.

So **why** doesn't the water in the ocean mix so that it is one temperature?

We can explore this in a simple demonstration.

Make sure you have the following materials and find the instructions on the following page.

Materials

- 2x identical small Jars
- Hot water
- Cold water
- Food colouring (red and blue)
- Index cards
- Scissors
- A large, shallow baking pan

Hot VS Cold Demonstration

- Fill one jar to the top with cold water and dye this water with the blue food dye.
- Fill the second jar with hot water and dye this water with the red food dye.

- Place an index card on top of the jar with warm water and flip the jar over, placing it on top of the cold jar (the air pressure will make sure it doesn't spill

- Slowly pull out the index card and watch what happens to the water.
- The cold water remains on the bottom because it is more dense (just like the cold water in the ocean) and the warm water stays on the top because it is less dense.
- What happens if you put the cold water on top?

Tips for Exploring Rock Pools

What to Wear

- Clothing that can get a little wet or dirty (shorts, t-shirts, or comfy layers)
- Shoes with good grip, such as old sneakers or water shoes to stop slipping on rocks
- A sun hat
- Sunscreen

What to Pack

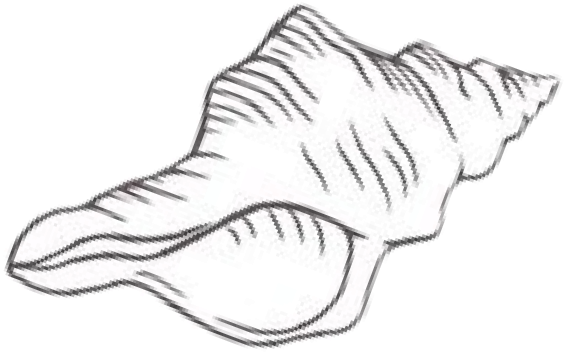
- Water bottle to keep hydrated
- A small snack in a reusable container
- A little notebook
- Bucket and spade
- A bag for rubbish
- Towel

Things to remember!

- **Check Tides:**
- **Be Safe:** Stay close to your grown up and watch for slippery rocks.
- **Check For Creatures:** Look for crabs, sea stars, and shells, but don't pick them up or take them home – they live in rock pools.
- **Listen To The Ocean:** Don't go too close to the waves, always keep an eye on the water.
- **Leave No Trace:** Take all your things home and pick up any rubbish you see to help the environment.

These shells are *missing* their owners!

Draw the animal you think might be living in these shells



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