Brink expedition
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Survive the race against time!

Curriculum

Module 3

Ocean Care

Section 2: Resources

Suitable for Lower Primary to Middle Secondary

Core Learning Outcomes Levels 2 - 6

Developed by: Kathleen Gordon

In partnership with:

- Department of Education and the Arts
- Association of Independent Schools of Qld
- Brisbane Catholic Education
- Qld Catholic Education Commission
- Earth Charter

Ocean Planet: The need for ocean literacy

Resource sheets

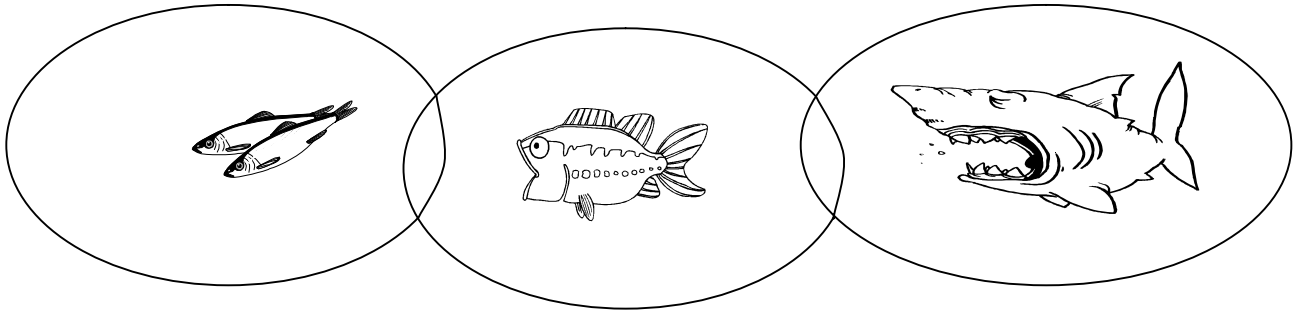
- Planet Ocean facts
- Marine food chain and web
- Estuarine food web cards 1 & 2
- Ocean energy cards
- Marine environments 1, 2 & 3
- World ocean map
- Brinkx marine ecoregion hotspots
- Sample retrieval chart
- Sample report assessment
- Sample reflection log

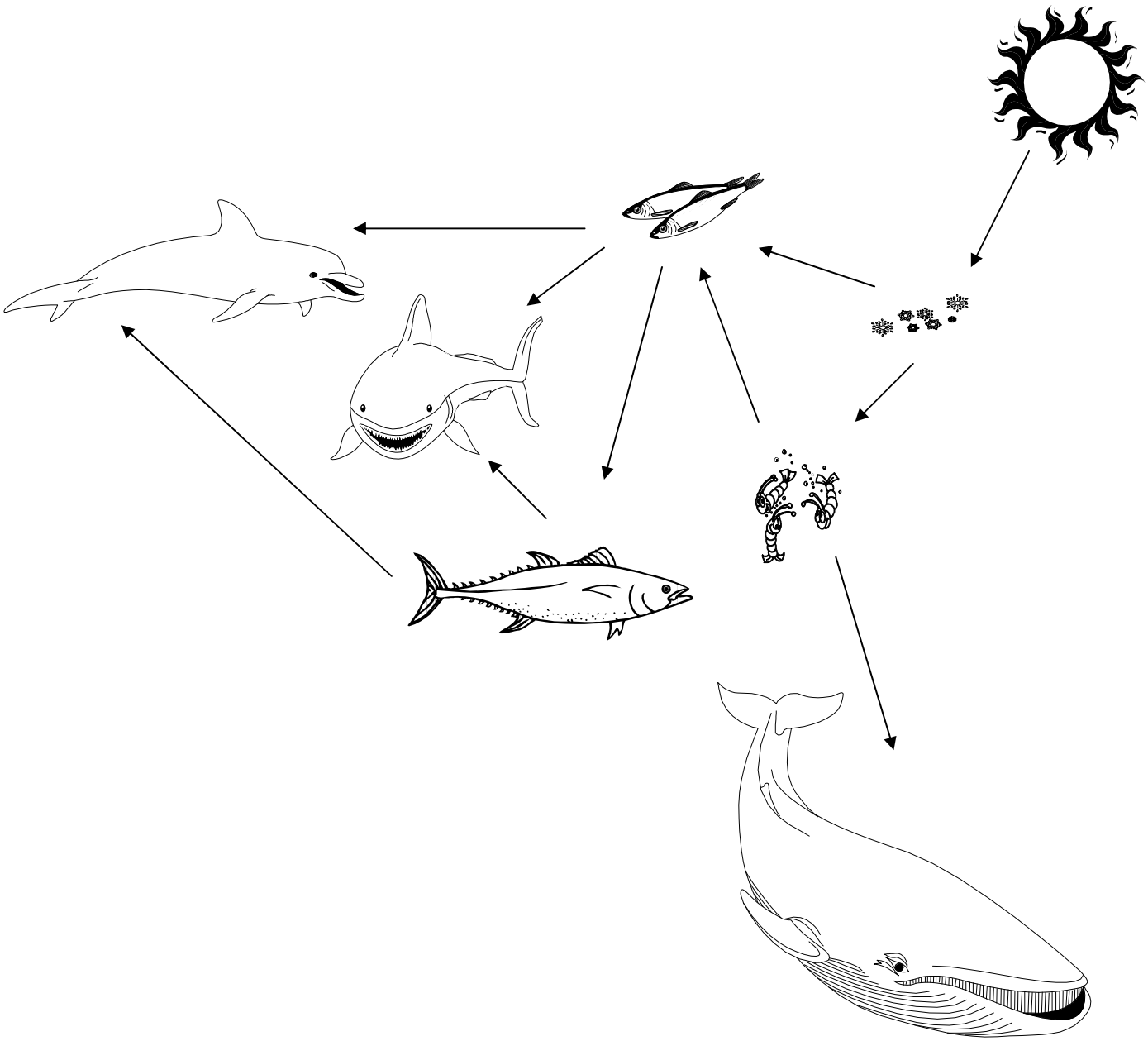
Resource sheet: Planet Ocean facts

Earth's oceans contain 97% of all the surface water on the planet. (The remaining 3% is fresh water and 2% of this is ice.)
Oceans and seas cover about 75% of the globe.
Oceans are separated by continents but they are all connected.
The Great Barrier Reef is one of the few living things that can be seen from the moon.
The blue whale is the largest mammal on Earth. It can grow up to 32 metres in length and weigh up to 144 tonnes.
Giant squid can grow up to 40 metres in length. They are the largest invertebrate in the world and have the largest eyes of any animal.
There are deep sea vents or cracks in the ocean floor that shoot out hot water. The water is heated by magma deep under the ocean floor.
The deepest parts of the ocean are 'v' shaped valleys called trenches. The deepest part of the ocean is the Mariana Trench near the Philippines. It is 10 860 metres deep.
There are volcanos under the ocean called seamounts. New Zealand and Hawaii are seamounts that have broken through the surface of the ocean to become volcanic islands.
Emperor penguins have been recorded diving to 483 metres below the ocean surface.
Elephant seals can dive more than 1000 metres below the ocean surface.
Sperm whales can dive more than 2000 metres below the ocean surface.
Salt water is more than 96% pure water.
Salt water has about 3% salt and very small amounts of over 90 elements including calcium, fluoride and gold.

We extract salt from the sea to use in our food.
The Pacific Ocean contains more than half of all the water (not including water as ice) on the planet.
The Pacific Ocean covers more than 1/3 of the Earth's surface.
The Pacific Ocean is the deepest and least salty of all oceans.
The Atlantic Ocean coves 1/5 of the Earth's surface.
The Atlantic Ocean is the saltiest ocean.
The Atlantic Ocean is the main connection between water from the south and north poles.
The Indian Ocean is the third largest ocean.
The Indian Ocean is mostly in the southern hemisphere so the water circulates in an anticlockwise direction.
The Indian Ocean contains the Red Sea (which is the saltiest sea) and the Persian Gulf (which is the warmest sea).
The Southern Ocean regularly produces waves over 20 metres high.
The Southern Ocean includes all the waters south of 55° South.
More than half of the Southern Ocean freezes over each winter and some parts are frozen all year round.
The Arctic Ocean is the smallest ocean.
The Arctic Ocean is covered in most places by a layer of ice.
The Arctic Ocean is the shallowest ocean.

Resource sheet: Marine food chain & web





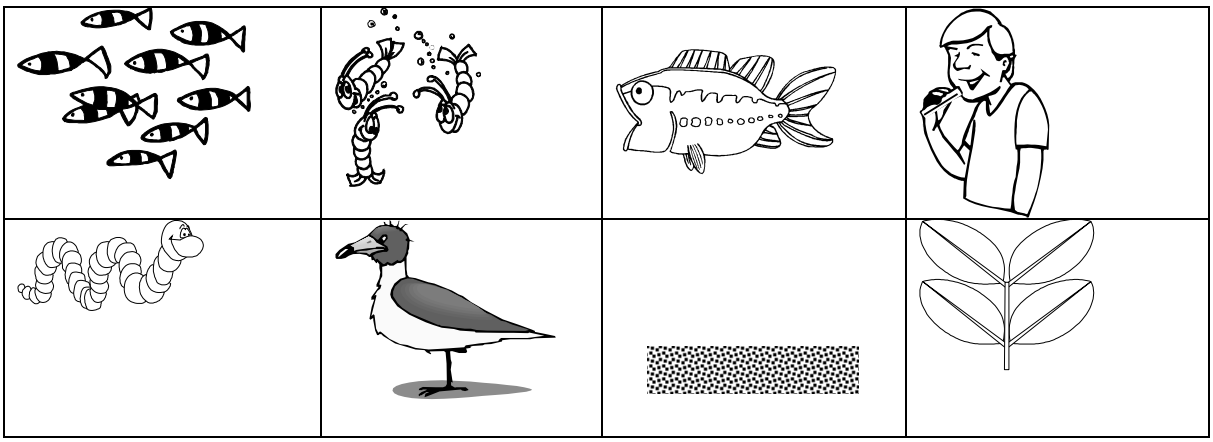
Resource sheet: Estuarine food web cards 1

Dugong I am connected to the seagrass because I eat it.	Seagrass I am connected to the mangrove honeyeater because it uses me to make its nest.	Mangrove honeyeater I am connected to the mangrove because I eat nectar from its flowers.
Mangrove I am connected to the mangrove snail because it lives on my trunk and leaves.	Mangrove snail I am connected to detritus because I eat it.	Detritus I am connected to the mud whelk because it eats me.
Mud whelk I am connected to the mud because I crawl across it in search of food.	Mud I am connected to the spoonbill because it shovels its beak through me to look for food.	Spoonbill I am connected to the baby fish because I eat them.
Baby fish I am connected to the silver gull because it eats me.	Silver gull I am connected to the rock because I like to perch on it to look for food.	Rock I am connected to the snake because it sleeps under me.
Snake I am connected to the osprey because it eats me.	Osprey I am connected to the whiting because I eat it.	Whiting I am connected to the worm because I feed on it.
Worm I am connected to the eastern curlew because it eats me.	Eastern curlew I am connected to the shrimp because I eat it.	Shrimp I am connected to the algae because I eat it.

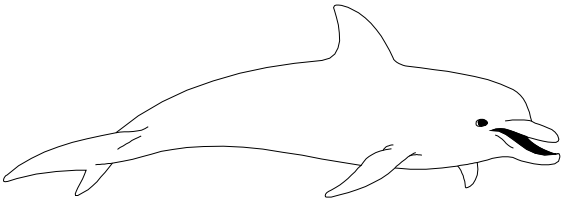
Algae I am connected to the seawater because I float around in it.	Seawater I am connected to mussel because it sucks me in to get food and then squirts me out.	Mussel I am connected to the water rat because it eats me.
Water rat I am connected to the yabby because I eat it.	Yabby I am connected to the ibis because it eats me.	Ibis I am connected to the insect because I eat it.
Insect I am connected to the duck because it eats me.	Duck I am connected to the prawn because I eat it.	Prawn I am connected to the barramundi because it eats me.
Barramundi I am connected to the mangrove because my young swim safety among its roots.	Mangrove I am connected to the mangrove heron because it makes its nest in my branches.	Mangrove heron I am connected to the crab because I feed on it.

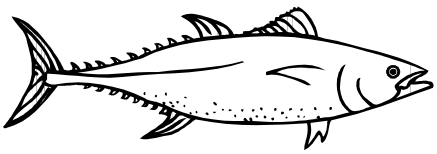
Resource sheet: Estuarine food web cards 2

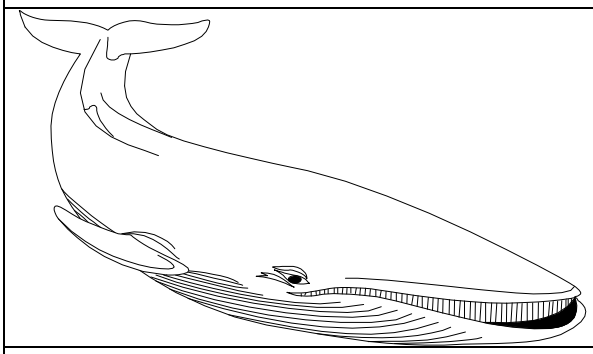
Dugong	Seagrass	Mangrove Honey Eater
Mangrove	Mangrove Snail	Detritus
Mud Whelk	Mud	Spoonbill
Baby Fish	Silver Gull	Rock
Snake	Osprey	Whiting
Worm	Eastern Curlew	Shrimp
Algae	Seawater	Mussel
Water Rat	Yabby	Ibis
Insect	Duck	Prawn
Barramundi	Mangrove	Mangrove Heron

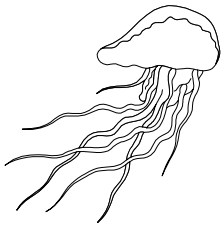


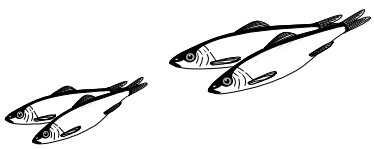
Resource sheet: Ocean energy cards

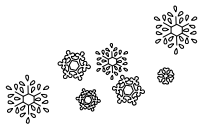


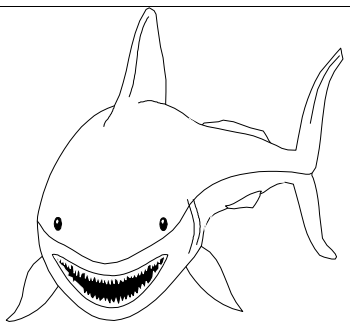


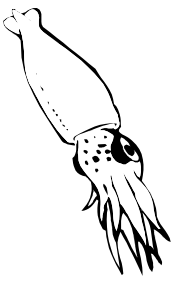


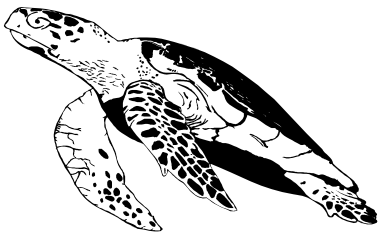












Resource sheet: Marine environments 1

Life in the ocean is dependent upon sunlight and the tiny plants called phytoplanktons that use sunlight to photosynthesise and grow. Animals live in all different parts or zones of the ocean. Where they live depends upon the amount of sunlight, temperature, pressure and movement of water.

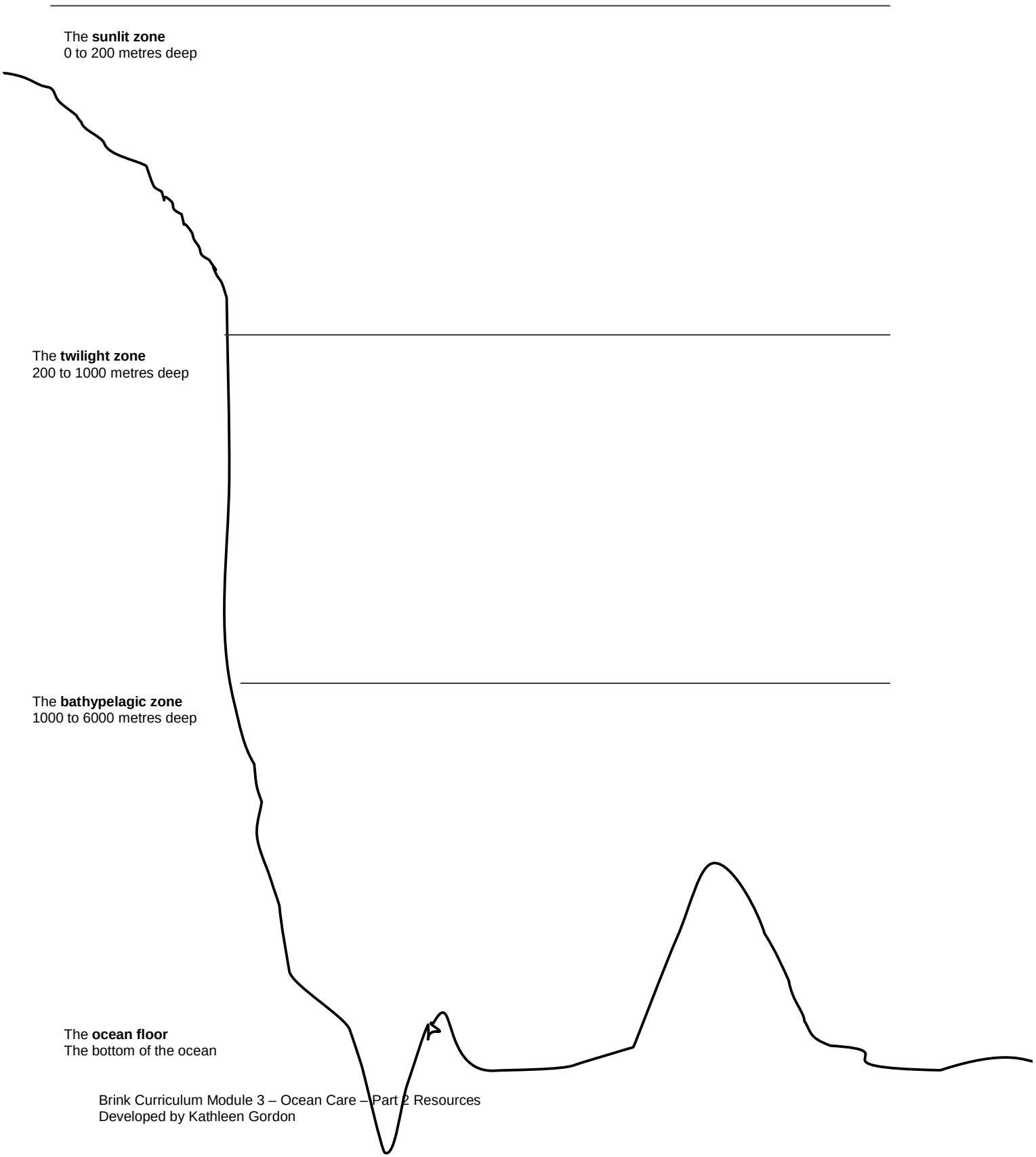
The sunlit zone
The sunlit zone is in the top 200 metres of the ocean. This zone has lots of light and water movement and warm temperatures. Sea plants live in this zone and provide food for animals including mammals, fish, birds and zooplankton. Mammals which must come to the surface to breathe include whales, dolphins, dugongs and seals. Most fish live in this zone. In the open ocean tuna and mackerel swim in schools and fish such as marlin and sailfish travel alone. Many birds live close to the shore while others only come to the shore once every three to five years. Petrels and albatrosses have long narrow wings that help them travel long distances over the open ocean. In the sunlight zone there are also animals that live on the surface and drift along with ocean currents such as zooplankton and jellyfish.

The twilight zone
The twilight zone is below the sunlit zone, between 200 and 1000 metres from the surface. There is less light, less oxygen, colder water temperatures and greater water pressure. Only blue light reaches this depth so plants can't grow. All animals living here depend on food produced in the sunlit zone. The animals in this zone have different characteristics to the animals living in the sunlit zone. They are less active and many drift or wait for food to come to them rather than swimming. Some get their food by moving up and down through the zones. Giant squid use siphons (breathing tubes) to move through the water by squirting. Nautiluses have gas filled shells that help them to float or sink. Sperm whales store oxygen in their blood, muscles and lungs so they don't have to breathe as often.

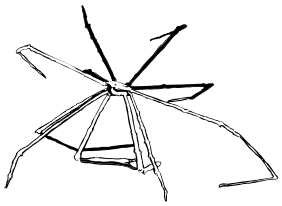
Bathypelagic zone
This deep ocean zone lies below the twilight zone between 1000 and 6000 metres below the surface. It is dark, cold and still. Some animals eat food that drops down from the zones above such as animal faeces, dead plants, fish and mammals. Some animals travel to another zone to eat and others eat animals from their own zone. Fish that live here have unusual features such as very large mouths, long sharp teeth and large eyes. Most of the animals that live in this zone glow in the dark. This bioluminescence is often produced by luminous bacteria living in their skin.

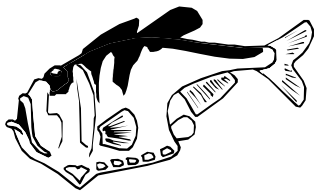
Bottom of the ocean
The bottom of the ocean can be rock, mud, clay or sand. It is very dark and still and the pressure is enormous. There are seamounts, deep sea vents and ocean trenches on the bottom of the ocean. Seamounts are volcanoes under the ocean. Deep sea vents are cracks in the ocean floor that shoot out hot water heated by magma under the ocean floor. Water coming out of the vents can be 400°C but the surrounding water is as cold as ice. Ocean trenches are 'v' shaped valleys. The Mariana's Trench is the deepest part of the ocean. It is 10 860 metres deep. Most animals that live on the bottom of the ocean, feed on food that drops down from above. Some are filter feeders and some eat animals that live on the ocean floor. Animals that live on the ocean floor move slowly. Many have soft bodies and large heads while some are blind and others have no colour. Sea spiders have long legs so they don't sink into soft mud. They have no eyes and use their legs to feel for food.

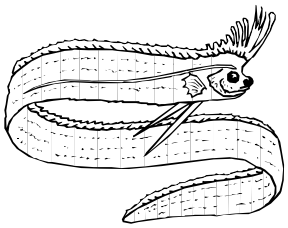
Resource sheet: Marine environments 2

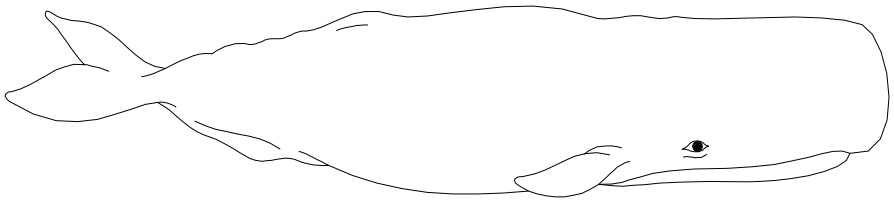


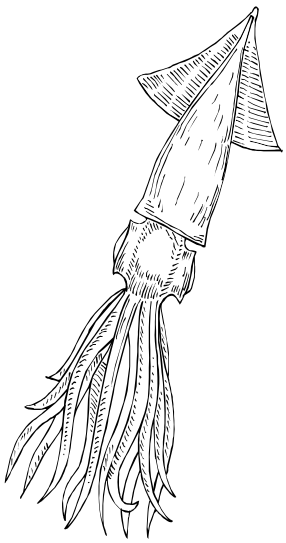
Resource sheet: Marine environments 3

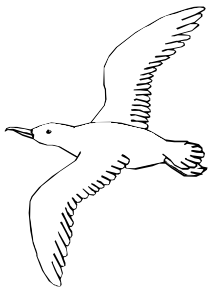












Resource sheet: World ocean map

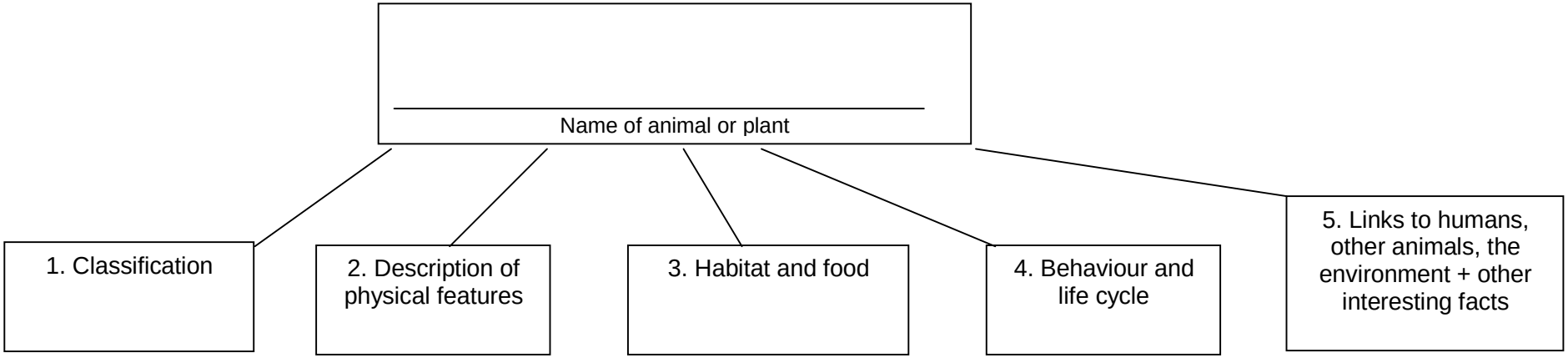
Resource sheet: Brinkx marine ecoregion hotspots

Complete this table using information from www.panda.org/about_wwf/where_we_work/ecoregions/global200/pages/list.htm

	Global 200 Ecoregions			
	238	**216**	**199**	**222**
Name				
Geographic location				
Habitat type				
Biodiversity features				
Selected species				

Resource sheet: Sample retrieval chart

A Suggested Plan for Writing - Factual Objective Description - Organisation of Notes



Resource sheet: Sample report assessment

NAME: _____

MARINE ECOLOGY RESEARCH

Your tasks

Choose a marine animal or plant and:

a) Find out about the plant or animal and record the information on a retrieval chart
b) Find or take a photograph or draw a detailed sketch of your chosen living thing
c) Use the information on the retrieval chart to write a short information report
d) Using a computer, design and produce a one page, colour, multimedia presentation about your chosen plant or animal, based on your report and photo/illustration.

You will also be required to complete a self-assessment sheet as you complete each task.

Student self-assessment

Part A: The retrieval chart *(Circle your response)*

I completed the retrieval chart	YES	NO
I listed all the sources of information I used	YES	NO

Part B: The illustration/photo *(Put an X on the line in the place that shows how well you worked)*

I drew/took/found the illustration/photo:

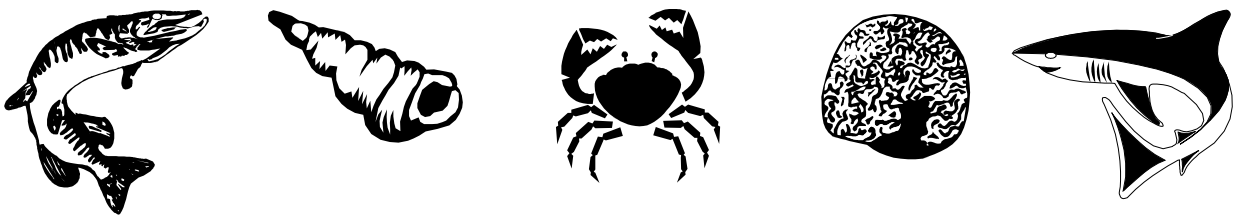
to the best of my ability ◆——|——|——|——◆ *without trying at all*

Part C: The report (*Circle your response)*

I handed in my first draft	YES	NO
I wrote about each topic/sub-heading	YES	NO
I checked my spelling	YES	NO

(Put a tick in the box that shows how well you worked)

	ALWAYS	SOMETIMES	NEVER
I used paragraphs effectively	☐	☐	☐
I used appropriate language	☐	☐	☐
I made an effort to do my best work	☐	☐	☐



STUDENT SELF-ASSESSMENT continued

Part D: Presentation

(Put a tick in the box that shows how well you worked)

	Very effectively	Effectively	Not very effectively
I organised/designed my presentation			
I can use the computer and software			
I made an effort to do my best work	Yes	Some-times	No

How to write a good report

Using paragraphs effectively

- Ø Write one paragraph for each heading/sub-topic.
- Ø Begin each paragraph with a topic sentence. The topic sentence tells what the rest of the paragraph will be about. Follow with a detailed description of each sub topic.

Using appropriate language

- Ø Reports use present tense (is, are, use, grow, live, eat).
- Ø Personal pronouns (I, my) are not used.
- Ø Concise (to the point) language is used.

How to list sources

- Ø List your sources at the end of the report.

- Ø Books

  Baker, Alan N., 1983, "Whales & Dolphins of New Zealand and Australia - An Identification Guide", Victoria University Press, Wellington

- Ø Magazines

  "Wildlife Australia", Vol. 12 No. 4, 1993, Wildlife Preservation Society of Queensland and World Wide Fund for Nature Australia, Brisbane

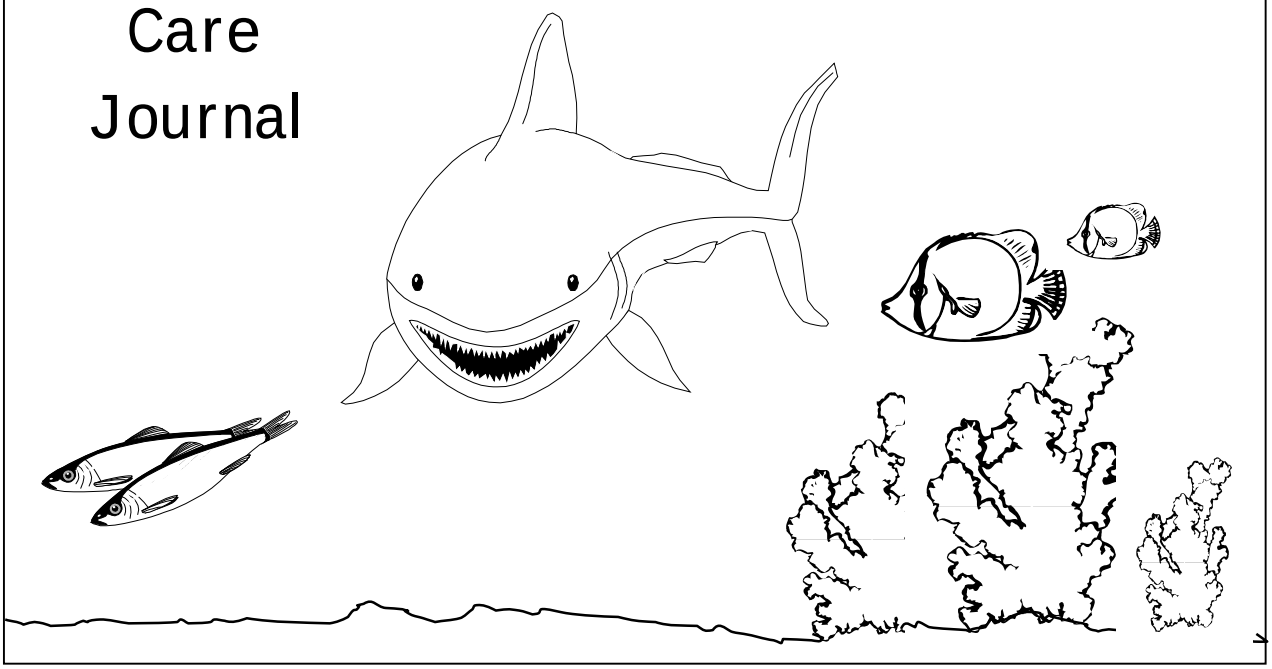
Note: If you type your report on a computer, the title of a book or magazine should be in italics (*italics*) and should not include quotation marks (" ") e.g. *Atlas of Environmental Issues.*

List your information sources here.

Resource sheet: Sample reflection log

Ocean Care Journal

Name: _____

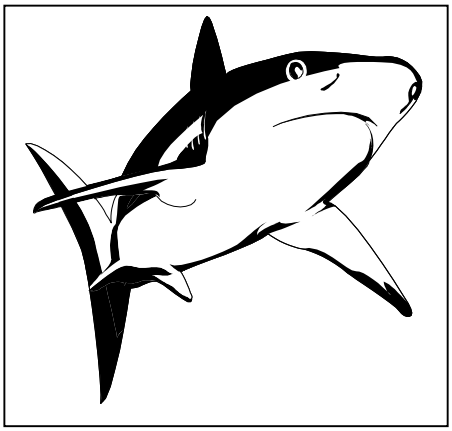


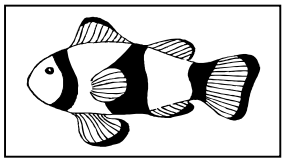
Things I have learnt about ocean life:

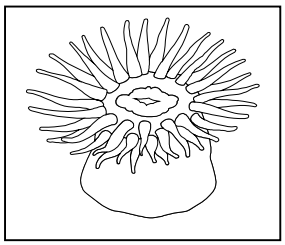
- _____
- _____
- _____

Name: _____

Ocean Care Journal







List the things you have learnt about oceans.

_____

_____

_____

_____

_____

_____

Draw a diagram that shows how living things in oceans are connected.

Journal entry 1: What have I learnt about the importance of oceans?

Write a paragraph or draw a labelled diagram that explains what you know about the importance of oceans to life on Earth.