

# PROGRAM NOTES



## YEARS 7 – 10

The following program notes have been designed to assist teachers during self-guided visits, and provide an educational and informative guide about many of the animals at Melbourne Aquarium. The program notes are accompanied by a worksheet that can be completed by students during their two-hour self-guided tour.

Included in the program notes are the answers for the student worksheet, extra information about some of the animals, and an extension question for each section. You may choose to discuss these questions during your visit, or use it as a post visit activity once you returning to school.

### Suggested timing guide for the visit and general focus of student worksheet:

**Antarctica – 20 mins:** Program focus - observe, identify and describe components of an Antarctic habitat. Identify adaptations and techniques of animals and compare with human survival in the same habitat.

**Weird and Wonderful – 20 mins:** Program focus - observe, identify, and classify the survival adaptations of animals.

**River to Reef:** Program focus - explore, observe, compare and describe survival adaptations of different animals and why they may have these unique adaptations.

**Cave – 15 mins**

**Billabong and Rockpools – 20 mins**

**Coral Atoll, Jellies and Octopus Cove – 15 mins**

**Sharks Alive – 20 mins:** Program focus - observing and comparing differences and similarities between closely related aquatic animals.

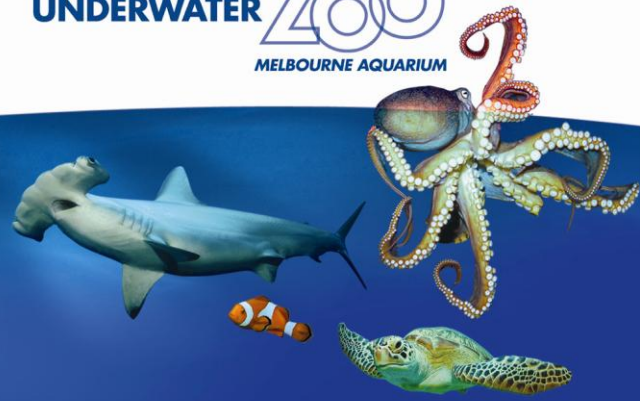




## VELS LEVEL 5 & 6: AREAS COVERED

STRAND	DOMAIN	DIMENSION
<b>Physical, Personal &amp; Social Learning</b>	<b>Interpersonal Development</b>	<ul style="list-style-type: none"> <li>• Building social relationships</li> <li>• Working in teams</li> </ul>
	<b>Personal Learning</b>	<ul style="list-style-type: none"> <li>• Managing personal learning</li> </ul>
<b>Discipline Based Learning</b>	<b>Civics &amp; Citizenship</b>	<ul style="list-style-type: none"> <li>• Community awareness</li> </ul>
	<b>English</b>	<ul style="list-style-type: none"> <li>• Reading</li> <li>• Writing</li> <li>• Speaking and listening</li> </ul>
	<b>The Humanities - Geography</b>	<ul style="list-style-type: none"> <li>• Geographical knowledge and understanding</li> </ul>
	<b>Mathematics</b>	<ul style="list-style-type: none"> <li>• Number</li> </ul>
	<b>Science</b>	<ul style="list-style-type: none"> <li>• Science knowledge and understanding</li> </ul>
<b>Interdisciplinary Learning</b>	<b>The Arts</b>	<ul style="list-style-type: none"> <li>• Creating and making</li> </ul>
	<b>Communication</b>	<ul style="list-style-type: none"> <li>• Listening, viewing and responding</li> </ul>

# ANTARCTICA



## List the *biotic* (living) and *a-biotic* (non-living) components that make up a penguin's habitat at Melbourne Aquarium

Biotic: Penguins (two species- King Penguins and Gentoo Penguins), penguin keepers occasionally

A-biotic: Ice, snow, rocks, water, oxygen, sunlight (artificial), food and waste

## Choose and illustrate ONE species of penguin

Show and label at least five adaptations that a penguin has in order to survive in this specific habitat.

**PENGUIN SPECIES:** Gentoo Penguin and King Penguin

- Insulating feathers – to keep the penguin warm
- Layer of fat or blubber
- Feathers have oil-type coating that repels water
- Webbed feet to assist swimming

## How do penguins avoid their predators? Consider colour and physical movements.

Penguins are generally preyed upon in the water, which is where they feed on small fish. For this reason penguins are agile swimming creatures, able to out-manoeuvre their predators. Gentoo penguins are the fastest swimming penguins in the world, they can swim up to 36km/h. Their appearance also plays a big role in avoiding predators, being black on top and white underneath when swimming penguins use a technique called colour shading. Looking down on a penguin their black back camouflages with the ocean floor, and when looking up for a penguin their white underneath camouflages with the sunlight effect from the surface of the water.

## How do humans manage to survive in an Antarctic habitat?

Moving into the next section of Antarctica there are two mannequins dressed in official Antarctic uniform. Main features of the uniform include: **highly-visible colour; no skin exposed at any time; multi-layered; made out of gortex.** Humans do not live in Antarctica for more that approx six months at a time.

### Extension question:

It is possible to see Little Penguins at St Kilda Beach and Phillip Island. Why is climate change such a problem for penguins if they can survive in Victoria?

Little Penguins are a different species of penguin, with a different habitat. Unlike gentoo and king penguins, little penguins live in a warmer environment. They generally swim in water 13 to 20°C and their land habitat includes sand, rocks, shrubs and bushes. A Little penguin would not be able to survive in Antarctica as they would freeze and be blown away in the Antarctic high winds (up to 300km). One of the consequences of global warming is the global temperature rising, resulting in ice melting in Antarctica. This means that the Antarctic penguin's habitat is diminishing, as they cannot live in non-polar habitats.





# WEIRD & WONDERFUL

Within this area, find an example of each of the survival adaptations outlined in the boxes below.

## CAMOUFLAGE

Eastern Stargazer, Stone-fish, Tassled Angler fish, sea dragon and seahorse...

### How does the animal use camouflage?

Camouflaging animals may use camouflage to blend into their surroundings to avoid being detected by predators, or they use camouflage to sneak up to prey in order to ambush them.

## CHANGE COLOUR TO LOOK LIKE SURROUNDS

Cuttlefish

### What changes can the animal make to look like surroundings?

Change in external colour or texture or changes in behaviour

## ARMOUR PROTECTION

Lobster, crab

### What is the purpose of the armour?

The armour, or exoskeleton, acts as a protective layer. It also maintains animal shape and gives support.

## VENOMOUS TO OTHERS

Lionfish, Stonefish

### How does the animal inflict venom?

Lionfish and Stonefish have 13 Dorsal (back) Spines  
Stonefish have 13 spikes on back  
Please note there is a difference between poisonous and venomous.

## How do these survival techniques help the above creatures to survive?

These survival techniques help animals to hide from predators, surprise their prey or attract a mate.

### Extension Question:

What is an increasing threat to these Weird & Wonderful animals, that previously they did not have to protect themselves from?

**Humans.** It has become very fashionable to keep exotic animals as pets. Unfortunately for these animals their special adaptations and star appearances in movies have made them more desirable to keep as an exotic pet. Often these creatures are illegally caught, using cyanide which harms not only those creatures, but also its surrounding habitat and other creatures. Tropical fish are hard to take care of, and often these creatures do not survive very long. In particular, the numbers of Clown fish, Blue Tang, and Lionfish in the reefs are dropping dramatically. To help prevent this from happening we can ask pet stores for collection licences when buying animals, and ensure that the correct habitat is set up at home for the animal to live in.



# RIVER TO REEF



## SUPER POWERS IN THE WATER

Some of the animals living in this part of the aquarium have some amazing skills. Observe the animals, read the information boards and talk to our staff to find out about these super powers!

Complete the table below to record the creatures and their super-powers:

CREATURE	SUPER-POWER (ADAPTATION)
Axolotls (in Lagoon Cave): are able to regrow their gills, legs and lungs etc. Northern Pacific sea stars (in Rocky Reef): are able to regrow limbs	Regeneration
Blind Cave fish (in Cave): do not have any eyes, they live in very dark caves and like bats use their extreme sense of hearing to move through the water	Sonar
Mudskipper (in Lagoon Cave)	Live in and out of water
Goby Desert Fish (in Cave) are able to live in temperatures from 5-40°C	Heat resistant
Sawfish (in Lagoon): species of ray that has a nose that looks similar to a sword.	Built-in sword
Green Tree frogs, like other frogs, they breathe through their skin both in and out of the water.	Breathe through skin
Sea-jellies (in Deep-sea display): have stingers underneath their body to sting those who may be trying to attack them.	Stinging cells
Turtles (In Cave and Billabong): possess a hard shell that they are able to hide in to avoid danger and possess claws to catch prey and strong jaws to crush small shelled animals	Shielded body

### Why do these creatures have these adaptations?

Several different water creatures have adapted themselves to live in extreme conditions, or to protect themselves from predators or extend their life.

### If you were a water creature, what super-hero qualities would you want? Why?

**Extension Question:** What are some ways we can help conserve our waterways?

Through education, awareness, and action, we can stop the water quality deteriorating further. We need to stop catching native species and reducing their numbers. Stop polluting our waterways, use sustainable seafood.



# SHARKS ALIVE



**What are the similarities and differences between a Grey Nurse shark and a Smooth stingray?**

SIMILARITIES	DIFFERENCES	
	Grey Nurse Shark	Smooth Stingray
Habitat – open ocean Breath through gills Cartilaginous skeleton Electrochemical reception Lack of gaseous swim bladder	Often teeth are visible Gills on side of body Short tail Mid-top of water column	Flat-shaped body Long-tail with barb Gills and mouth underneath body

**Sharks:** In the Oceanarium at Melbourne Aquarium you can find three large species of sharks: Grey Nurse shark; Scalloped hammerhead shark and Sandbar whaler shark. Other species of shark that live at the Melbourne Aquarium are the Port Jackson shark, Spotted Wobbegong shark, Whiskery shark, Leopard shark, and the Tawny Nurse shark, they are smaller in size and are often found at the bottom of the display. The Fiddler Ray is often confused for a shark, but because its gills are located on the underside of its body, it is a ray and not a shark.

**Grey Nurse Shark:** This Grey Nurse shark is an endangered species extinct in the wild in Victoria. It feeds on medium – large sized fish. They are of no danger to humans as their teeth are not designed to eat anything bigger than a large sized fish.

**Stingrays:** In the Oceanarium at Melbourne Aquarium you can find two large species of stingrays, the Smooth stingray and the Southern eagle ray. Other species of stingray that live at Melbourne Aquarium include the Blue-Spotted stingray; the White-Spotted eagle ray and the Fiddler ray.

**Smooth stingray:** The largest species of stingray in the world – 4m top to tail and weighing up to 350kg. They possess a barb located in their tail that they use to protect themselves from danger. Their tail is raised, the barb is stuck out at a 45 degree angle then struck against whatever is on top of its back. The barb breaks away from the tail and remains in the victim, the sting can retreat from the threat and will regrow a new barb.



# SHARKS ALIVE



## What are some physical features of sharks and rays that help them survive?

Consider physical appearance, their colour, their food, and predators.

Like penguins, some sharks and rays use colour shading, **being dark on top and light underneath**. Looking down on a shark or ray their dark back camouflages in with the ocean floor, and when looking up their white underneath camouflages with the sunlight effect from the surface of the water. Other sharks and rays are found in colours similar to the ocean that they swim in, to make them less visible.

You may notice smaller fish swimming behind the Grey Nurse Shark in the Oceanarium.  
**Suggest a reason why fish have this behaviour.**

Schools of smaller fish that swim behind sharks are often the size of fish that makes up a sharks diet. By swimming behind the shark, they are less likely to be seen, thus not getting eaten.

### Extension Question:

Are the sharks and stingrays at Melbourne Aquarium dangerous to humans?

None of the sharks or stingrays at Melbourne Aquarium pose immediate threat to humans. Although the teeth of the Grey Nurse Shark look dangerous they are unable to swallow anything larger than a medium fish. Stingrays only use their defensive barb when they feel threatened– this can occur when someone accidentally stands on them or swims too close above them. We have been led to believe that sharks are dangerous by the media and from movies (such as Jaws), though in reality out of the 385 species of sharks there are only five that pose a possible threat to humans; they are Great White Shark, Tiger Shark, Great Hammerhead, Mako Shark, and the Bull Shark.

