



# Staying Alive: Australian Animal Adaptations

YEAR 5  
BIOLOGICAL SCIENCES



**QGC**

**FUTUREMAKERS**



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# Future Makers

Future Makers is an innovative partnership between Queensland Museum Network and Shell's QGC business aiming to increase awareness and understanding of the value of science, technology, engineering and maths (STEM) education and skills in Queensland.

This partnership aims to engage and inspire people with the wonder of science, and increase the participation and performance of students in STEM-related subjects and careers — creating a highly capable workforce for the future.

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# EXPLORE - EXPLAIN

## Staying Alive: Australian Animal Adaptations

### Teacher Resource

In this activity, students investigate how adaptations support survival in specific habitats. They consider the living and non-living (biotic and abiotic) conditions of five Queensland habitats and suggest general adaptations that would assist survival in these locations. Students then work in small groups to explore two animals from one habitat. They identify, analyse and compare the adaptations that help these animals survive in the habitat, linking form and function, before sharing their learnings with the class group.

The habitats and animals featured within this activity can be explored further in [Wild State](#) at the Queensland Museum. Queensland is the most biodiverse state of Australia; it is home to 70% of Australia's mammal species, 80% of bird species and 50% of reptile, frog and plant species. Such a diversity of animals exists because Queensland has a broad range of environmental conditions that produce unique habitats in which these animals can live. *Wild State* highlights Queensland's amazing array of habitats, including arid outback, open forest, rainforest, coastal and intertidal and marine, and unpacks why the state has such a huge diversity of animals. Further information about the exhibition can be found in the [Wild State Teacher Resource](#).



*Wild State* exhibition at Queensland Museum. QM, Peter Waddington.

To extend or further support learning about adaptations, you and your students could view the [Museum Experts Videos](#) series. In this series, past and present Queensland Museum scientists discuss the structural, physiological and behavioural adaptations of some of our amazing wildlife, including: [Bee Flies](#), [Carpet Pythons](#), [marine mammals](#), [swimming crabs](#), [Tortoise Beetles](#) and [Velvetfish](#).

Detailed step-by-step instructions for this activity can be seen below. It is recommended that you use these instructions to guide your students through the activity.

1. Inform students that Queensland is Australia's most biodiverse state. In other words, Queensland contains the greatest variety of living things in the country. Queensland has:

- 70% of Australia's mammal species
- 80% of Australia's bird species
- 50% of Australia's reptile, frog and plant species

These species live in five unique habitats across Queensland: arid outback, open forest, rainforest, coastal and intertidal and marine. Remind students that a habitat is the natural home or environment of an animal, plant or other organism. Explore students' prior knowledge and experiences of these habitats through a class discussion.

2. Divide students into groups of three or four. Ask student groups to choose a habitat from the following list:

- Arid outback
- Open forest
- Rainforest
- Coastal intertidal
- Marine

Distribute the related habitat image to student groups (see *Teacher Resource: Habitat Images*). Students work in groups to identify the living and non-living factors of the habitat, the challenges animals might experience living in the habitat and the features or adaptations that would help an animal survive in the habitat (see *Student Activity: Exploring Habitats*). Student groups then share their responses with the class.

3. Distribute the following animal images to student groups (see *Teacher Resource: Animal Images*). Student groups should receive the animal that lives in their chosen habitat:

- Arid outback: Greater Bilby (*Macrotis lagotis*)
- Open forest: Eastern Grey Kangaroo (*Macropus giganteus*)
- Rainforest: Southern Cassowary (*Casuarius casuarius*)
- Coastal intertidal: Saltwater Crocodile (*Crocodylus porosus*)
- Marine: Green Sea Turtle (*Chelonia mydas*)

We recommend printing the animals to A3 to assist in viewing and labelling. Inform students that these animals live in the students' chosen habitats. Ask students to observe the animal, and to identify any features they think would assist its survival in the habitat. Students could record these features in their workbooks; they should also justify their responses.

4. Distribute relevant adaptation lists to student groups (see *Teacher Resource: Animal Adaptations*). Provide time for students to read and discuss the adaptations. You could also ask students to respond to the following questions: Which adaptations do you already know about and which are new to you? Are there any adaptations that surprised you? Why did they surprise you? Ask students to cut out the adaptations.

5. Inform students that animals can have three different types of adaptations. Organisms can have structural adaptations. These are the physical features of an animal's body that help it to survive in its environment. Ask students to find an example of a structural adaptation in their list of adaptations. Students share their examples with the class.

Organisms can also have behavioural adaptations. These are something an organism does in response to a change in its environment. Provide students with examples of behavioural adaptations, if required. Ask students to find an example of a behavioural adaptation in their list of adaptations. Students share their examples with the class.

Finally, organisms can have physiological adaptations. These are the internal features of an organism that help it to survive in its environment. We cannot see these adaptations when looking at the organism, because they occur inside the organism. Provide students with examples of physiological adaptations, if required. Ask students to find an example of a physiological adaptation in their list of adaptations. Students share their examples with the class.

6. Ask students to sort the adaptations of their animal into these three types. Ask students to let you know when they have finished, so that you can check their work. Students then colour code the adaptations using three different colours, and then glue the adaptations on the animal sheet, making sure to place the adaptation near the appropriate feature. Students draw in label lines using a pencil and a ruler.

7. Inform student groups that they will now research the adaptations that help a second, different animal survive in the same habitat (see *Student Activity: Comparing Adaptations*). Provide students with time to complete the research task. Students may find more search results by broadening their search terms, i.e. by searching 'shearwater adaptations' in addition to 'wedge-tailed shearwater adaptations'.

To conclude the research task, students use a Venn diagram to compare and contrast the adaptations of the two animals. They then suggest why these animals might have different adaptations, even though they live in the same habitat. This discussion could occur in small groups and then as a class group to ensure misconceptions are not developed. You may like to discuss how different animals have different predators and different prey or how they may live in different parts of the same habitat (i.e. in the water or on land). Animals will therefore develop different features that respond to these requirements, in order to help them survive. You could also discuss how adaptations to specific habitats develop over a very, very long period of time. Over the course of time, animals may develop different solutions to the same problem - similar to students who are provided with the same brief to a design challenge, and yet many develop different designed solutions.

8. Student groups could share their findings from the activity with the class group or in a jigsaw group. They could also display their findings in the classroom for others to view.

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## Curriculum Links

### Science

YEAR 5

#### Science Understanding

Living things have structural features and adaptations that help them to survive in their environment (ACSSU043)

#### Science Inquiry Skills

Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts (AC SIS093)

### General Capabilities

#### Literacy

Comprehending texts through listening, reading and viewing

Composing texts through speaking, writing and creating

#### Information and Communication Technology

Investigating with ICT

#### Critical and Creative Thinking

Inquiring – identifying, exploring and organising information and ideas

#### Personal and Social Capability

Social Management

**Staying Alive: Australian Animal Adaptations**  
**Teacher Resource**  
**Habitat Images**

**Arid Outback**



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**Open Forest**





## Rainforest



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**Coastal Intertidal**



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## Marine



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# Staying Alive: Australian Animal Adaptations

## Teacher Resource

Animal Images

Greater Bilby (*Macrotis lagotis*)



**Eastern Grey Kangaroo (*Macropus giganteus*)**



**Southern Cassowary (*Casuarius casuarius*)**



**Saltwater Crocodile (*Crocodylus porosus*)**



**Green Sea Turtle (*Chelonia mydas*)**



*QM, Gary Cranitch*



# Staying Alive: Australian Animal Adaptations

## Teacher Resource

### Animal Adaptations

#### Greater Bilby (*Macrotis lagotis*)

Sleeps in a deep burrow during the day to avoid the heat.	Produces concentrated urine to reduce water loss.	Large, thin ears to release heat.
Powerful forelimbs and claws for digging burrows and finding food.	Keen sense of smell to detect predators and prey.	Female pouch opens backwards so that it doesn't fill with dirt when digging.
Long, sticky tongue to lick up seeds and small insects from the ground.	Does not need to drink water, as they obtain enough moisture from their food.	Keen sense of hearing to detect predators and prey.

#### Eastern Grey Kangaroo (*Macropus giganteus*)

Large, powerful tendons in the hind legs act like springs to move the animal at fast speeds with minimum effort.	Long, muscular tail used for balance when hopping and to provide stability while fighting upright.	Light grey fur to blend into its habitat.
Feeds from dusk until dawn when food is most abundant.	The nutrients in a female kangaroo's milk change depending on the nutritional requirements of the joey.	Spends time under shady trees during the day to avoid heat.
Adult males 'spar' to establish dominance.	Licks forearms to cool down.	Stomach is divided into two parts. The first part ferments the food to release nutrients. The second part breaks down the food to complete digestion.

**Southern Cassowary (*Casuarius casuarius*)**

Black feathers to blend into the dark rainforest habitat.	The helmet, or casque, on top of its head may help to keep the cassowary cool.	The inside toe has a large, dagger shaped claw used to fight other cassowaries.
A specialised digestive system lets the bird eat toxic fruits and seeds.	Stretches tall, ruffles its feathers and makes a loud hissing sound to scare off intruders.	Tough skin to protect from fights with other cassowaries.
Males have bright blue skin and a red, fleshy wattle (seen under the neck) to attract females.	Long, sharp claws to scratch leaf litter for food.	Males teach their chicks which foods to eat and which to avoid.

**Saltwater Crocodile (*Crocodylus porosus*)**

Brown skin to blend into its habitat.	Nostrils, eyes and ears are along the top of the head so the animal can smell, breathe, hear and see while the rest of its body is underwater.	When underwater, small flaps of skin cover the ears to make them watertight.
Powerful jaws to hold onto and crush prey.	Hatchlings 'chirp' to gain the attention of their mother.	Reduces heart rate to stay underwater for long periods of time.
A special transparent eyelid closes over the crocodile's eye for protection when underwater.	Strong, muscular tail to help make sudden lunges from the water to catch prey.	Excellent hearing to locate prey in poor light or low visibility conditions.

### Green Sea Turtle (*Chelonia mydas*)

Two long, muscular front flippers to propel through the water.	Finely serrated jaws to help eat vegetation.	Reduces heart rate to stay underwater for long periods of time.
Has salt glands to get rid of excess salt in the body. These empty from the eyes.	Counter-shaded (the top shell is dark while the bottom shell is light) to blend into its habitat.	The shell provides protection from predators.
Uses the Earth's magnetic field to navigate the oceans.	Females lay many eggs (as many as 575 in a breeding season) to help ensure the survival of some offspring.	Two short rear flippers act like rudders to help steer through the water.

# Staying Alive: Australian Animal Adaptations

## Student Activity

### Exploring Habitats

Select a habitat to investigate. Use the image provided by your teacher to think about the:

- Living (biotic) and non-living (abiotic) factors of the habitat
- Challenges animals might experience living in the habitat
- Features or adaptations that would help animals survive in the habitat

Record your thoughts and ideas in the mind map below.

The diagram is a mind map with a central box labeled "Habitat:". Four lines radiate from this central box to four surrounding boxes, each with a specific label:

- Living Factors:** Top-left box.
- Non-Living Factors:** Top-right box.
- Challenges:** Bottom-left box.
- Adaptations:** Bottom-right box.

# Staying Alive: Australian Animal Adaptations

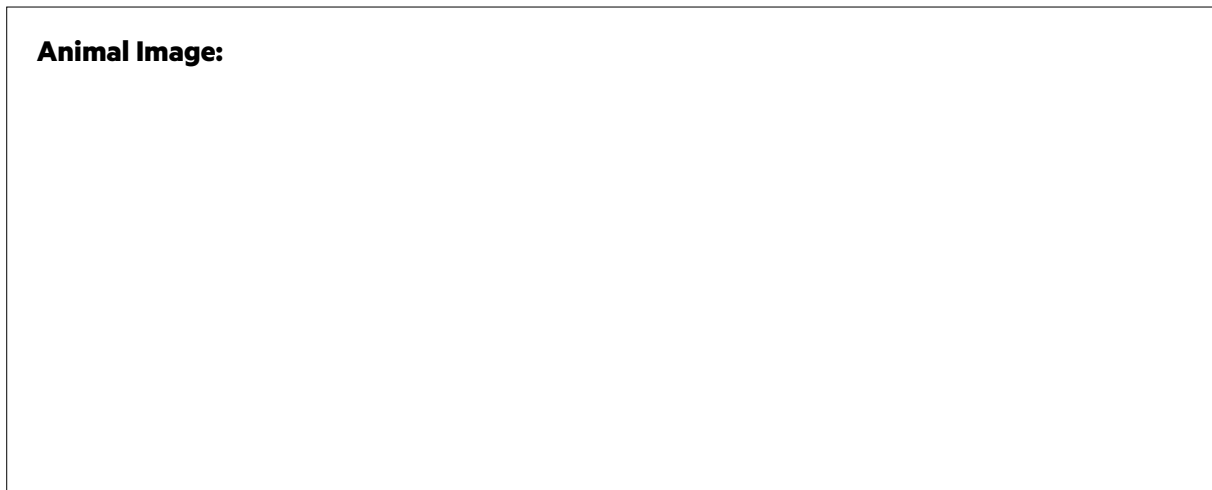
## Student Activity

### Comparing Adaptations

You will now research the adaptations of a second animal that lives in the same habitat. Select your animal from the list below, and then identify the structural, behavioural and physiological adaptations that help the animal survive in its habitat.

<b>Arid Outback:</b>	Thorny Devil ( <i>Moloch horridus</i> )
<b>Open Forest:</b>	Sugar Gilder ( <i>Petaurus breviceps</i> )
<b>Rainforest:</b>	Lumholtz's Tree Kangaroo ( <i>Dendrolagus lumholtzi</i> )
<b>Coastal Intertidal:</b>	Wedge-tailed Shearwater ( <i>Ardenna pacifica</i> )
<b>Marine:</b>	Gulf Wobbegong Shark ( <i>Orectolobus halei</i> )

**Animal Image:**

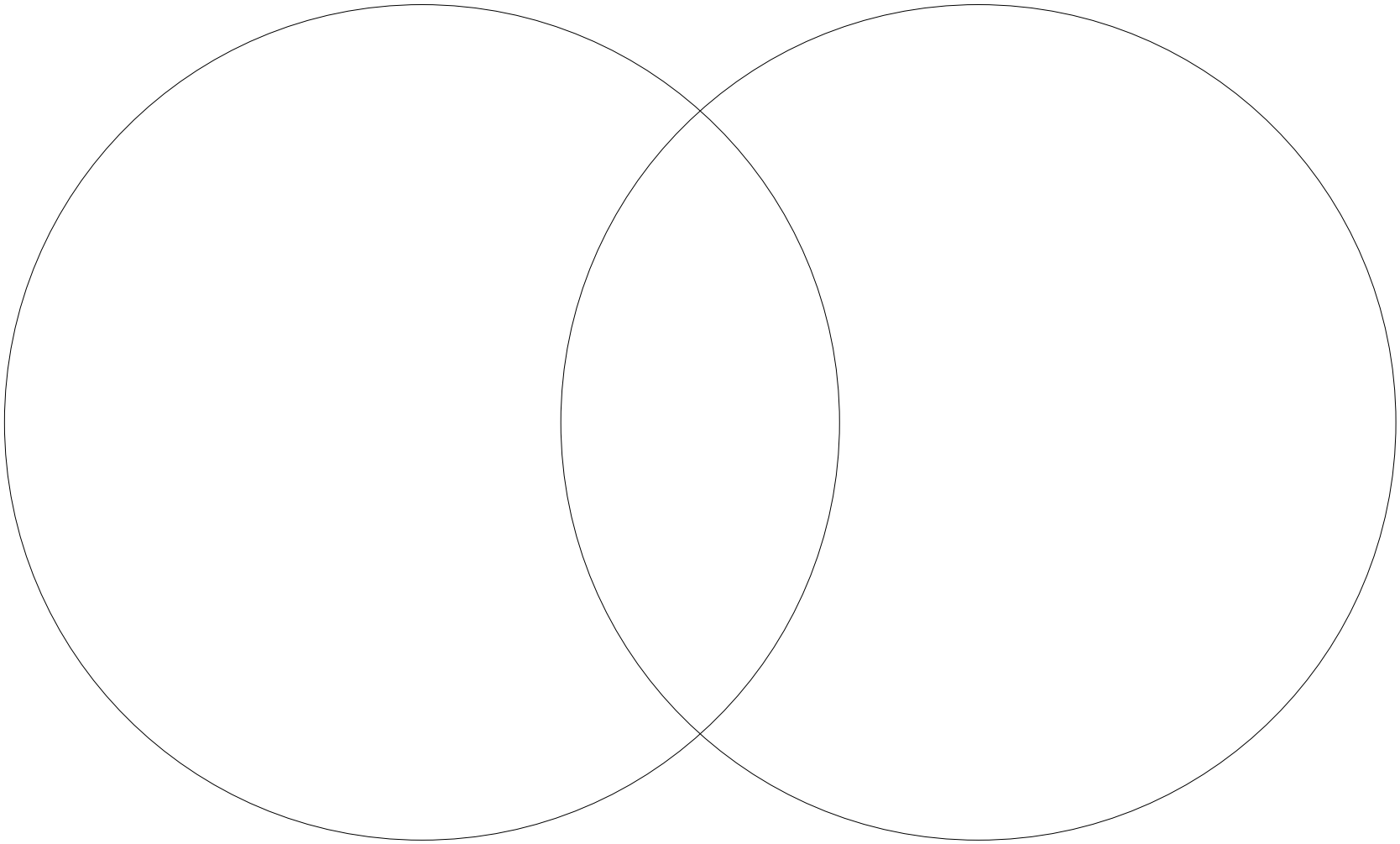


<b>Structural Adaptations</b>	<b>Behavioural Adaptations</b>	<b>Physiological Adaptations</b>

Compare the adaptations of the two animals you have investigated.

**Animal One:**

**Animal Two:**



Suggest why these animals might have different adaptations, even though they live in the same habitat.

