Teacher Resources & Activities

Grades Pre-K to 3

Australian Outback

San Diego Zoo Wildlife Explorers

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Welcome to the Australian Outback

Australian Forest

G'DAY MATE!

Come along as we explore the unique wildlife and diverse ecosystems found on the continent of Australia. The "Land Down Under" is home to koalas, kookaburras, platypuses, and Tasmanian devils—and these are just a few of the more than 760 bird and mammal species found here and nowhere else in the world. Also widespread across Australia are the eucalypt forests that flourish along the hillsides. These gum trees provide critical food and shelter for koalas, wallabies, echidnas, and many other species.

Here at San Diego Zoo Wildlife Alliance, we focus our work across eight key regions called Conservation Hubs, where we collaborate with innovative partners to save wildlife worldwide. Through our Australian Forest Conservation Hub, we combine conservation science and technology, expertise in wildlife care and health, and collaborative partnerships to help wildlife and people adapt to their changing environment and the ecosystems they share.

On St. Bees Island, a small island off the northeast coast of Queensland, we studied the local populations of koalas with our teams and partners. Here we gained valuable insights into how much land koalas need to find enough food and shelter, in addition to learning more about their complex ecology, mating behaviors, and health. This information is informing future koala conservation strategies.

Platypuses are found in freshwater streams across eastern Australia. They're notoriously elusive, and there's still much we don't know about them. We're collaborating with our partners at the state-of-the-art Platypus Rescue HQ to better understand their biology and how we can safeguard their future.

Conservation efforts like these help koalas and platypuses thrive in Australia and here at the San Diego Zoo and San Diego Zoo Safari Park.

About Australia

Australia is the world's sixth largest country and close to the same size as the continental United States. It has six states and two territories. The capital is Canberra. About 27 million people live in Australia. In comparison, about 343 million people live in the United States. In Australia, 86 percent of the people live in cities. In addition to Canberra, the biggest cities are Melbourne, Sydney, Brisbane, and Perth. Australia is famous for its coral reefs, marsupial wildlife, Aboriginal art and culture, and the Outback.

Australia is home to some of Earth's most unique wildlife and habitats. Australia's eucalypt forests provide food, shelter, and resources for wildlife and local communities.

The activities in this book *will help you explore Australia's habitats and animals with your students. There are two activities per grade level: one at an introductory level and another at a content application level. You can use them independently, or pair them with a visit to the Zoo to experience Conrad Prebys Australian Outback. Here you'll see kookaburras and wallabies, along with the largest colony of koalas outside of Australia.*

SIZE

Adult koalas can weigh from 9 to 33 pounds (4 to 15 kilograms), with males about 50 percent heavier than females. They are about 2 to 3 feet (61 to 91 centimeters) long. A baby koala, called a joey, is about the size of a jellybean when born and must crawl up to the mother's pouch. Mammals with pouches are called marsupials.

HABITAT

Koalas live in eucalypt forests. They depend on gum trees for food and shelter. Koalas rest or sleep in the trees and are most active between 5 p.m. and midnight. Sharp, curved claws on their forefeet help them climb up and down trees.

DIET

Koalas are vegetarians. They eat young leaves from the branches of eucalyptus trees. Koalas have big jaws with powerful muscles. They also have sharp teeth to tear and chew the tough leaves.

COMMUNICATION

While mostly quiet, koalas can have a big voice. Males bellow to attract a mate. When a koala encounters another, the two may squawk or snarl, and females or young may wail.

Koala

Phascolarctos cinereus

SIZE

This crocodile is the world's largest reptile, reaching up to 20 feet (6 meters) long and around 2,600 pounds (1,180 kilograms). Females are smaller, often reaching 10 feet (3 meters).

HABITAT

Saltwater crocodiles live along the coastal regions of northern and northeastern Australia. They often swim up rivers or inhabit brackish swamps. Unique to Australia, they are seen in billabongs, pools of isolated water that form when a river changes course.

DIET

Most active at night, this crocodile hunts fish, reptiles, birds, and mammals. Its heavyset jaw has anywhere between 64 and 68 teeth. Generally, larger prey is torn into chunks, which are swallowed whole.

COMMUNICATION

Crocodiles are generally solitary and quiet, but they can hiss, grunt, and growl. When hatching from their eggs, young crocodiles chirp, which signals to the mother to dig them out of the nest.

Saltwater Crocodile

Crocodylus porosus

SIZE

These possums are 12 to 14 inches (30 to 35.5 centimeters) from head to rump. Their prehensile tail is almost as long as their body. They weigh about 2 pounds (1 kilogram).

HABITAT

Native to eastern Australia, common ringtail possums live in rainforests, shrubby woodlands, eucalypt forests, and coastal shrub habitats. They are often at home in suburban gardens, too.

DIET

When foraging, ringtail possums prefer the young leaves on eucalypt trees, but will also eat flowers, fruits, and leaves from other trees and shrubs lower in the rainforest canopy. Like most possums, ringtails are nocturnal, resting during the day and foraging at night.

COMMUNICATION

Ringtail possums are generally quiet. Occasionally, they use a soft, high-pitched twittering chirrup or a chattering alarm call with harsh grunts. The young sometimes make a repetitive shrill chirruping call, which sounds almost birdlike.

Common Ringtail Possum

Pseudocheirus peregrinus

SIZE

Laughing kookaburras are the largest members of the kingfisher family. They are also the largest of four species of kookaburras, weighing about 7 to 16 ounces (198 to 453 grams) and measuring about 17 inches (43 centimeters) from head to tail.

HABITAT

The laughing kookaburra is native to the eastern part of the Australian continent. Eucalypt forests and woodlands provide homes for laughing kookaburras. Just as the song says, it's typical to see a kookaburra "on an old gum tree."

DIET

Laughing kookaburras eat small animals—both vertebrates and invertebrates—living on or near the ground. They typically eat millipedes, grasshoppers, other insects, spiders, and small reptiles. Worms, crabs, crayfish, frogs, fish, snakes, small mammals, and birds are less common prey. Sometimes a kookaburra beats its prey against its perch to stun, immobilize, or kill the animal before swallowing it whole.

COMMUNICATION

The kookaburra's famous "laugh" is a social call that's typically done by more than one bird. Each day before dawn, a group of kookaburras starts the day with a loud chorus of "laughter," and they often say goodnight the same way at dusk. Young kookaburras begin to laugh when they are about six weeks old, and by the time they reach three months, they sound like adults.

Laughing Kookaburra

Dacelo novaeguineae

SIZE

Tasmanian devils can be 23 to 26 inches (58 to 66 centimeters) long, with a tail that's about 10 inches (25 centimeters) long. They weigh between 11 and 31 pounds (5 to 14 kilograms). Males are typically heavier than females.

HABITAT

Tasmanian devils live in the island state of Tasmania, which is part of Australia. They can be found in forests, woodlands, and agricultural areas that have coastal scrub and eucalypt forests.

DIET

A meat-eater with powerful jaws and sharp teeth, the Tasmanian devil searches at night for dead animals to eat. They make the most of their meals, as they are able to crush and eat bones, too. They also hunt live prey, such as small mammals and birds.

COMMUNICATION

Usually solitary, Tasmanian devils sometimes come together over a carcass. While feeding, they scream and snarl, fighting for a position.

Tasmanian Devil

Sarcophilus harrisii

SIZE

Short and stocky, the southern hairy-nosed wombat stands about 15 inches (38 centimeters) tall at the shoulder. Adults weigh between 39 and 80 pounds (18 to 36 kilograms) and are 33 to 43 inches (84 to 109 centimeters) long.

HABITAT

These wombats live in dry or semidry grasslands and woodlands found in South Australia and the southern part of Western Australia.

DIET

An herbivore, wombats graze on perennial grasses, especially spear grass. Wombats don't travel far to eat. They forage close to their burrow openings. Their feeding habits may create a "lawn," or grazing halo, around the openings of their burrows.

COMMUNICATION

Generally solitary unless raising young, the wombat primarily communicates through scent and scratch marks. They may mark territory by leaving droppings or drops of liquid from scent glands. When defending territory, individuals may make growls or even a high-pitched scream. Mother and young may keep in touch by grunting.

Southern Hairy-Nosed Wombat

Lasiorhinus latifrons

SIZE

One of the larger pythons in Australia, womas usually grow to 6.5 feet (2 meters), but individuals have been seen as large as 10 feet (3 meters).

HABITAT

Woma pythons live in dry, sandy areas around sand dunes and sand hills in central Australia. If nearby woodlands or shrublands have sandy areas, womas can survive there, too. These snakes seek shelter in rock crevices and empty fallen logs, but may also dig burrows.

DIET

Woma pythons eat reptiles, such as lizards and other snakes, along with small mammals, especially young rabbits. They usually hunt at night. Unlike most pythons, womas do not have heat-sensing pits on their faces.

COMMUNICATION

This snake communicates primarily through smell and touch, although it may occasionally hiss. Womas are typically solitary, meeting only during mating.

Woma Python

Aspidites ramsayi

SIZE

A smaller relative of kangaroos, Parma wallabies are 17 to 20 inches (43 to 51 centimeters) long and weigh about 7 to 13 pounds (3 to 6 kilograms). Females are generally shorter and weigh less than males.

HABITAT

These wallabies are found in dense, shrubby understory in the high rainfall areas of eastern Australia's New South Wales. They generally hide and rest during the day and forage at night.

DIET

Parma wallabies feed among the grasslands, grassy woodlands, heathlands, and sedge swamps bordering dense forests. They graze mostly on grasses, such as tussock grass and blady grass. They also eat various herbs and fungi.

COMMUNICATION

Parma wallabies communicate visually by foot stomping, tail wagging, and rushing forward with their heads stretched out. Mostly quiet, these wallabies may make noises during courtship; males produce soft clucks, while females hiss.

Parma Wallaby

Macropus parma

SIZE

Palm cockatoos are the heaviest of all 21 species of cockatoos. As adults, they weigh between 19 and 35 ounces (539 to 992 grams). They can grow to be 24 inches (61 centimeters) long.

HABITAT

This cockatoo lives in the rainforests of far northern Queensland, Australia. They can also be found on the island of New Guinea. They require large trees habitat for nesting and roosting.

DIET

Cockatoos gather in large, noisy flocks—which sometimes include two or three different cockatoo species—to feed on berries, seeds, nuts, and roots.

COMMUNICATION

Cockatoos are arguably the loudest of all the parrots and squawk loudly to communicate with one another. In addition, this cockatoo has a special talent. Palm cockatoos break off a small branch and strike it against a hollow tree to attract potential mates or mark their territory.

Palm Cockatoo

Probosciger aterrimus

SIZE

Adult short-beaked echidnas are about 14 to 21 inches (35.5 to 53 centimeters) long, with a 3.5-inch (9-centimeter) tail, and weigh 5.5 to 15 pounds (2.5 to 7 kilograms). The echidna and the platypus are the only monotremes, or egg-laying mammals.

HABITAT

Short-beaked echidnas can be found in forests, rocky areas, hilly ground, and sandy plains of mainland Australia and Tasmania. They can also be found in central and southern New Guinea. To avoid extreme temperatures, they burrow for shelter in rock crevices and hollow logs.

DIET

Echidnas are insectivores and primarily eat ants and termites. Using their pointed snout and sharp claws, echidnas break into ant and termite nests in the late afternoon or at night, resting during most of the day.

COMMUNICATION

When threatened, echidnas roll up into a ball, tucking in their snout and feet and raising their spines. Most communication is through scent; echidnas don't vocalize very often.

Short-Beaked Echidna

Tachyglossus aculeatus

SIZE

Adults reach about 17 inches (43 centimeters), with a tail as long as 6 inches (15 centimeters). These creatures weigh about 4 pounds (2 kilograms). The echidna and the platypus are the only monotremes, or egg-laying mammals, in the world.

HABITAT

These unusual animals live in and around freshwater streams, lakes, and lagoons of eastern Australia. When swimming underwater, the platypus is blind and deaf; skin folds protect and cover their eyes and ears. They use their sensitive bills to explore the river bottom.

DIET

Platypuses are crepuscular, meaning they are most active at dawn and dusk. They forage during the early morning and late afternoon. As a bottom feeder, they probe the gravelly river bottoms for animals like crayfish, shrimp, worms, snails, and tadpoles.

COMMUNICATION

Mostly silent and solitary, the platypus can growl. Adults usually meet once a year to mate.

Duck-Billed Platypus

Ornithorhynchus anatinus

SIZE

One of the largest birds, the emu stands 5 feet (1.5 meters) tall and weighs between 66 and 121 pounds (30 to 55 kilograms). Emu eggs are also large, as big as 1.5 pounds (680 grams). Females lay between 5 and 15 eggs.

HABITAT

Emus live in a variety of habitats across Australia, including eucalypt forests, grasslands, woodlands, and open areas on the coast and inland. They avoid dry land that has an annual rainfall of less than 20 inches (51 centimeters).

DIET

These large birds eat a variety of items, from plants, seeds, and fruits to various insects. Emus spend most of the day searching for food. They may eat items from the ground or pluck leaves from trees, such as the acacia.

COMMUNICATION

Emus have many different calls, but generally females “boom” while males “grunt.” Females and males make their calls during courtship and mating and to defend territory or nesting sites.

Emu

Dromaius novaehollandiae

Emu photo: nmulconray/ iStock/Getty Images Plus

GRADE
Pre-K & K

Gumdrop Koala

LEARNING OUTCOME

Students recognize that a koala needs food, water, air (oxygen), and shelter to survive. NGSS performance expectation: *K-LS1-1*

INTRODUCTION

Koalas make their home in the eucalypt forests growing in eastern Australia. They eat the young leaves of various kinds of gum trees and nothing else. They rarely drink water, and get most of the moisture they need from the leaves they eat. They breathe air (oxygen). A koala may rest or sleep up to 20 hours each day, nestled into a fork in the branches of a tree for shelter.

MATERIALS

Map of Australia.

Picture of a koala. You can find a picture on page 22.

Copy of the Gumdrop Koala activity sheet, one for each student.

Crayons.

Fresh eucalyptus leaves. If you don't have these trees in your area, you can get a sprig at your local flower shop. When handling any plant or flower, check with your students about allergies.

ACTIVITY

Before beginning this activity, post the map of Australia in your classroom.

Step 1 Start a class discussion by posting the picture of the koala so all students can see it. Ask the students to identify the animal. After correctly naming it as a koala, ask the students if they know where this animal lives, what it eats and drinks, and where it might find shelter. Widen the discussion to include the survival needs of students. Where do they live? What do they eat?

Step 2 Read the Gumdrop Koala story. Assess students' listening skills by asking, "Where does Gumdrop make his shelter?" "What does he eat?" "What does he breathe?" "Where does Gumdrop get the water he needs?" Distribute the fresh eucalyptus leaves. What do they feel like? What do they smell like? Could people eat them? (NO!)

Step 3 On the map of Australia, show students the area where koalas live in the eucalypt forests of Queensland, New South Wales, and Victoria in eastern Australia. Tell them koalas eat only eucalyptus leaves and rarely drink water. Discuss why koalas have these survival traits. Ask the students if people could survive living like a koala does. Why not?

Step 4 Distribute the Gumdrop Koala activity sheets. Ask the students to identify the food items in the tree and draw a line to the items koalas eat.

Step 5 Ask the students to share their completed activity sheets, expressing the reasons or showing the evidence for their choice(s). Encourage a class discussion and explore student opinions. After the discussion, post the completed activity sheets in the classroom so students can view and compare.

I WONDER . . .

What does it take to make a koala feel at home? If you were designing a place for koalas to live, what would you include?

GRADE
Pre-K & K

Gumdrop Koala Activity

INSTRUCTIONS

Gumdrop the koala is hungry. Help Gumdrop climb the tree to find his favorite food, eucalyptus leaves. Draw a line to what koalas eat.

G'day mate! *My name is Gumdrop, and I'm a koala. I make my home in the eucalypt forests of eastern Australia.*

I like to rest and sleep most of the day. My bed is comfortable for me. It's a eucalyptus branch! I hang on with my feet and sit in the space between the trunk and branch for shelter. I also like to eat. Not fruit, bugs, popcorn, pizza, or ice cream, but eucalyptus leaves! They are close to me in the trees; I can just reach out and nibble on them. I rarely drink water, as I get most of the moisture I need from the leaves I eat. I breathe air, just like you.

GRADE
Pre-K & K

Home Sweet Habitat

LEARNING OUTCOME

Students identify where animals are able to find shelter in different Australian habitats. NGSS performance expectation: *K-ESS3-1*

INTRODUCTION

In order to survive, all animals need to find food, water, air, and shelter within their habitat. Animals need shelter to hide from predators, rest, or raise their young safely. Some animals find shelter in woodland trees, like koalas, kookaburras, and palm cockatoos. Some animals burrow in the grasslands, like wombats. Woma pythons live in sandy areas near dunes and hide in rocky crevices; saltwater crocodiles find shelter in water; and wallabies live in and near forests, hiding in the shrubby understory.

ACTIVITY

MATERIALS

Pictures of habitats: river, forest, grassland, woodland, and sandy plain. These pictures start on page 15.

Pictures of animals: wallaby, koala, palm cockatoo, kookaburra, echidna, woma python, saltwater crocodile, Tasmanian devil, and wombat. These pictures start on page 22.

Copy of the Home Sweet Habitat activity sheet, one for each student.

Step 1 Begin activity by reviewing what an animal needs to survive: food, water, air, and shelter. Then ask the students to name some habitats (places) where animals live. Examples are river, forest, desert, and grassland. Ask these probing questions: "Do all animals live in all places?" "If not, why not?" Ask the students to think about the relationship between what an animal needs to survive and the place where they live.

Step 2 Either in student groups or as a class, introduce the pictures of the habitats. Discuss each one, looking for places to find shelter, food, and water. Next, introduce the animal pictures. Work together to identify the animals and the places where they might live and give reasons as to why that might be.

Step 3 After discussing the possibilities, either in groups or as a class, correctly match the animal to its habitat. Answers are wallaby (forest), koala (forest), palm cockatoo (forest), kookaburra (woodland), echidna (woodland), woma python (sandy plain), saltwater crocodile (river), Tasmanian devil (woodland), and wombat (grassland).

Step 4 Distribute the Home Sweet Habitat activity sheet. Ask the students to use their knowledge to match animals to habitats.

Step 5 As a class, ask the students to share their work and explain why they made their choices.

I WONDER . . .

How do you think humans can find air to breathe, water to drink, food to eat, and shelter in the ocean habitat?

GRADE
Pre-K & K

Home Sweet Habitat Activity

INSTRUCTIONS Draw a line from the animal to the correct habitat.

Grassland photo:

GRADE

1

Aussie Animals

LEARNING OUTCOME

Students identify the inherited traits of reptiles, birds, and mammals. NGSS performance expectation: *1-LS3-1*

INTRODUCTION

Australia is home to many interesting reptiles, birds, and mammals. Reptiles are cold-blooded animals covered with scales. Young reptiles are born either alive or by hatching from eggs. Reptile eggs are soft and leathery. The young are usually independent at birth. Birds are warm-blooded and covered with feathers. All birds hatch from hard-shelled eggs that must be incubated to promote the growth of the embryo. All young birds require care after hatching. Mammals are warm-blooded and covered with hair. Most mammals are born alive, with two exceptions; both the echidna and platypus, found in Australia, hatch from leathery eggs. The young of all mammals need extensive parental care before they become independent. Mammal mothers provide milk to nourish their babies.

Aussie Animals

ACTIVITY

MATERIALS

Map of the world.

Map of Australia.

Whiteboard or large writing surface.

Pictures of a koala, kookaburra, wombat, wallaby, palm cockatoo, Tasmanian devil, saltwater crocodile, and woma python. You can find these pictures starting on page 22.

Copy of Aussie Animals activity sheet, one for each student.

Crayons or colored pencils.

Before beginning this activity, write the headings "reptile," "bird," and "mammal" on a whiteboard or large writing surface. Attach a picture of a woma python under the reptile heading, a picture of a kookaburra under the bird heading, and a picture of a koala under the mammal heading.

Step 1 Begin the activity by identifying the types of animals on the board. Point to the woma and ask, "What are reptiles covered with?" (Scales.) Point to the kookaburra and ask, "What are birds covered with?" (Feathers.) Point to the koala and ask, "What are mammals covered with?" (Hair.) Invite students to name other reptiles, birds, and mammals. Ask them, "What are the common traits of each animal?" "Why are we able to identify them as a reptile, bird, or mammal?" Create a list of the student suggestions by spelling the names of, or drawing pictures of, the animals under each correct heading. Students might suggest animals, such as a spider or a crab, that don't fit into these categories. If this happens, list these to the side of the three headings.

Step 2 Using the animals listed on the board, ask the students to analyze and find patterns. Use the following questions to guide the conversation: "How are reptiles and birds the same? How are they different?" "How are reptiles and mammals the same? How are they different?" "How are birds and mammals the same? How are they different?" "How are you like reptiles? How are you different?" "How are you like birds? How are you different?" and "How are you like mammals? How are you different?".

Step 3 Next, show students a map of the world, and ask a volunteer to find Australia. When located on the world map, switch to the continent map of Australia. Explain to the students that they are going to learn about some of the reptiles, birds, and mammals that live in Australia.

Step 4 Show the pictures of the Australian animals—koala, kookaburra, wombat, wallaby, palm cockatoo, Tasmanian devil, saltwater crocodile, and woma—to the students one at a time. With each picture, ask the students if the animal is a reptile, bird, or mammal, then ask why they think so. Post the pictures under the correct heading on the board. Also ask students, "If these animals had babies, would the babies go under the same category, too?"

Step 5 Distribute the Aussie Animals activity sheets. Have the students follow your directions to color the animals. Ask the students to share their work with the class.

I WONDER . . .

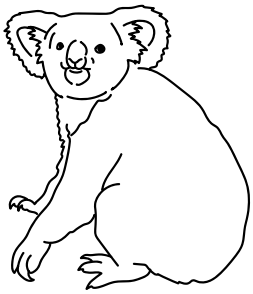
Describe how it would feel if you were covered with scales. Describe how it would feel if you were covered with feathers.

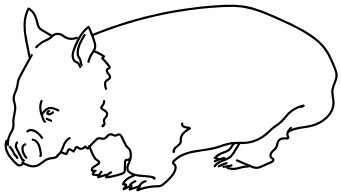
GRADE 1

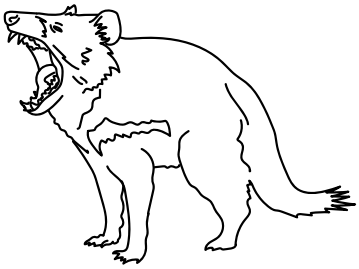
Aussie Animals
Activity

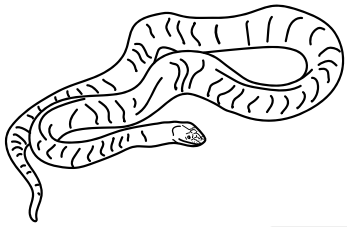
INSTRUCTIONS

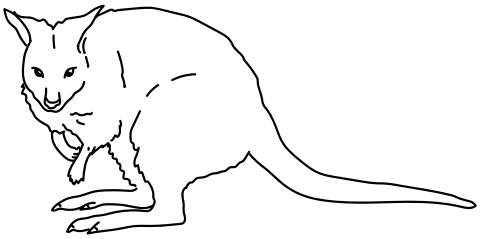
Color the reptiles red, the birds blue, and the mammals yellow. On the line beside each picture, write why you made this choice.











GRADE

1

Hello World!

LEARNING OUTCOME

Students recognize a pattern in birthing strategies for a variety of Australian animals. NGSS performance expectation: *1-LS3-1*

INTRODUCTION

Birthing strategies can be used to determine a pattern between different animals and how young resemble their parents. Birds always hatch from eggs. Some reptiles hatch from eggs, and some hatch from eggs inside the female's body and then appear to be born alive. Once young are born, reptiles are usually on their own. Most mammals are born alive, with the exception of the echidna and the platypus, which hatch from leathery eggs. Egg-laying mammals are in a group called monotremes. Australia is also home to marsupials—mammals (such as the koala) that are raised in a pouch. One characteristic that makes mammal babies (especially humans) different from all other animals is that they require a lot of parental care as they grow and change.

MATERIALS

Pictures of a koala, kookaburra, wombat, wallaby, palm cockatoo, Tasmanian devil, saltwater crocodile, and woma python. You can find these pictures starting on page 22.

Copy of Hello World! activity sheet, one for each student.

Colored pencils or crayons.

Whiteboard or large writing surface.

ACTIVITY

Before beginning this activity, post the map of Australia in your classroom.

Step 1 To begin the activity, ask the students to think about how animals are born. Use these questions as prompts if needed: "How are birds born?" "How are reptiles born?" "How are mammals born?" "How were you born?"

Step 2 On a whiteboard or writing surface, write the headings "hatch from egg" and "live birth." Have students name some animals that hatch from eggs and some animals that are born alive. Where do people belong? Write student suggestions or draw simple pictures under each category. Ask the students to look at the list again to identify the birds, the reptiles, and the mammals. Which column has the most of each kind? Can they see a pattern?

Step 3 Tell students they will be shown pictures of animals they may not know. Then show each picture of the Australian animals and have students decide if they hatch from eggs or if they are born alive. Post the pictures under the headings. Show the echidna last. If students guess that echidnas are born alive, explain that while most mammals are born alive, there are two species of mammals that hatch from eggs—the echidna and the platypus. Both of these animals live in Australia.

Step 4 Distribute the Hello World! activity sheets and colored pencils or crayons to each student. Ask the students to match the young to its parent and note with an "E" which animals hatched from eggs.

Step 5 After students complete the sheet, invite them to share their work and give reasons for their selections.

I WONDER . . .

Describe what it would be like to hatch from an egg and take care of yourself.

Hello World!
Activity

INSTRUCTIONS

Match each young animal on the outside to its parent on the inside. Put an "E" next to the animals that hatched from eggs.





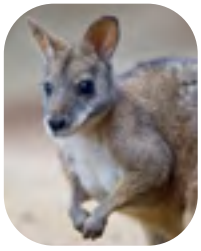










GRADE

2

Compare, Contrast, and Classify

LEARNING OUTCOME

To explore animal diversity, students compare and contrast 12 Australian animals. NGSS performance expectation: *2-LS4-1*

INTRODUCTION

Scientists who study animals often look for a unique or special characteristic that sets one animal apart from another. They may sort animals with feathers, fur, or scales into different groups. They may sort animals by what they eat: carnivore, herbivore, or omnivore. Some animals may be sorted by the way they move: walk, swim, climb, or fly. Scientists may also sort animals by location: desert, ocean, forest, grasslands, or lake. There are many ways to look at animals and explore animal diversity.

MATERIALS

One copy of the Australian animal cards (pages 22–23) for each student pair. Cut cards apart and collate into sets; keep one set for yourself.

Pencils or pens.

Pictures of a koala, kookaburra, and woma python. You can find these pictures starting on page 37.

ACTIVITY

Step 1 To begin this activity, lead the students in a review of the characteristics of birds (feathers, wings), reptiles (scales, cold-blooded), and mammals (hair, live birth, nurse young). Ask the students if they can give an example of each. Show the photos of the koala, kookaburra, and woma. Ask the students to name the characteristics of each.

Step 2 Next, divide students into pairs and distribute a set of Australian animal cards to each pair. Ask the students to identify and write the name of the animal on each card. Tell each student pair to sort their cards into bird, reptile, or mammal categories.

Step 3 As a class, review the cards and the categories. Discuss the characteristic(s) of each animal that led to placing it into a category. Ask the students to record how many cards are in each category.

Step 4 Ask the students to sort their cards by the way the animal moves. Does it hop, fly, swim, climb, dig, walk, or slither? Ask the students to share their process criteria for sorting, and record the number of cards in each category. Repeat again for two more categories: by habitat and by a characteristic of choice determined by the students. Record the number of cards in each category.

Step 5 As a class, review the students' results. Discuss similarities and differences between sorting methods and the results. Can students identify any patterns? If so, what are they?

I WONDER . . .

How does diversity help many animals live in the same area?

KOALA

KOOKABURRA

TASMANIAN DEVIL

WOMA PYTHON

WALLABY

WOMBAT


SALTWATER CROCODILE


PALM COCKATOO


RINGTAIL POSSUM


ECHIDNA


DUCK-BILLED PLATYPUS


EMU

GRADE

2

Australian Animal Diversity

LEARNING OUTCOME

Students learn that many different animals survive in the varied habitats found in Australia. *NGSS performance standard: 2-LS4-1*

MATERIALS

Map of Australia.

Pictures of a koala, kookaburra, palm cockatoo, echidna, saltwater crocodile, wallaby, wombat, woma python, ringtail possum, and Tasmanian devil. You can find these pictures starting on page 37.

Copy of Animal Profiles, pages 6–11.

Copy of Australian Animal Diversity activity, one for each student.

Pencils, crayons, colored pencils, or pens.

Journal or blank paper.

I WONDER . . .

Choose one of your adaptations and describe how life might be different without it.

INTRODUCTION

The Australian continent, the smallest of the seven continents, is home to more than 5,000 different animal species, most (80 percent) living nowhere else on Earth. Each animal has its own strategy for survival, relying on physical characteristics and learned or instinctual behavior to gather food and water, find a mate, and seek shelter. Unique to Australia is the number of marsupials, or mammals that don't have a placenta; they carry their developing young in an external pouch.

ACTIVITY

Step 1 Post the map of Australia in the classroom so all students can see it. Draw the students' attention to the map and ask if anyone knows what it is. After identifying the map as Australia, ask the students if they can name some animals that live there. Where might each animal live? (Forest, grassland, sand dunes, river, or woodland.)

Step 2 Divide students into working groups and distribute animal pictures. Ask the students if they can guess where these animals live and how they survive. Use these questions as prompts, if needed: "How do they eat and find water?" "Where do the animals find shelter?" "Do any of them live together?" Have the groups record their answers in a journal or on a blank piece of paper.

Step 3 After students have recorded their answers, distribute the Animal Profile cards. Ask the students to read each card, check their guesses, and make corrections if necessary.

Step 4 Distribute the Australian Animal Diversity activity sheet, one to each student. Follow the directions on the activity sheet. Student groups may work together, but each student must create a unique animal.

Step 5 When finished, ask the students to share their work with the class, explaining their animals and their creative process. After every student has shared, examine the unique animals for any shared characteristics.

Australian Animal Diversity Activity

GRADE 2

My animal is .....

Draw your animal in this box

Tell where and how your animal lives in Australia.

.....

.....

.....

.....

.....

.....

.....

GRADE

3

Life Cycle Match-Up

LEARNING OUTCOME

Students examine the traits inherited from parents by chronologically sequencing the growth stages of a plant, bird, reptile, and marsupial mammal. *NGSS performance standard: 3-LS3-1*

INTRODUCTION

Newborn animals inherit traits from their parents. When first born or hatched, some animals look just like their parents. This pattern of development is known as precocial; that is, already prepared to live alone. Other animals don't look like their parents at all and need many months or years of growth. This pattern is known as altricial. Studying the stages of an animal's birth and growth helps scientists determine the best way to help animals that are in danger of extinction.

MATERIALS

Pictures of a koala, kookaburra, saltwater crocodile, and eucalypt tree. You can find these pictures starting on page 37.

Single-sided copies of the animal cards on pages 27–28, one for each student pair.

One sheet of construction paper for each student pair.

Glue or glue sticks.

Scissors.

ACTIVITY

To prepare for this activity, ask the students to bring in pictures of themselves when they were between one and five years old. Post pictures on a bulletin board or wall in the classroom without naming the student in the picture.

Step 1 To begin, ask the students if they were able to match any of the pictures to their classmates. Were some pictures easier to match than others? Why is this? What characteristics did the students look for? Discuss how some students have changed a lot since they were younger and now are more difficult to match.

Step 2 Create student pairs and distribute the scissors and copies of the animal cards. Tell students to cut the cards apart and arrange the pictures in order from birth to adult.

Step 3 Review the results as a class. Did all students get the same answers? Why or why not? Ask the students to explain their selection criteria. What were they looking for?

Step 4 After students have made modifications so all the life sequences are correct, distribute the construction paper and glue or glue sticks. Tell students to glue their sequences to the front and back of the construction paper, adding their observations and reasoning.

Step 5 Ask student pairs to share their results. Can students create a life sequence for a new animal of their choice?

I WONDER . . .

Most young mammals look like their parents. How do you look like your parents? How do you look different from your parents?

GRADE

3

Neat Feet

LEARNING OUTCOME

Students match different animal feet to their functions. *NGSS performance expectation: 3-LS4-3*

INTRODUCTION

To find food, animals may dig, paddle, crawl, fly, or do other behaviors to catch prey or gather edible plants. Depending on the different environments the animal inhabits, its feet may have webbed toes for swimming, claws for scratching or burrowing, talons for grabbing, or soft pads for sticking to surfaces. Looking at an animal's feet can tell you about their lifestyle and where they live. Some animals are able to thrive in some habitats, while other animals don't survive at all.

MATERIALS

Pictures of a koala, wallaby, kookaburra, wombat, and crocodile. You can find these pictures starting on page 37.

Copy of Neat Feet activity sheet, one for each student.

Pencils with erasers.

ACTIVITY

Step 1 Ask the students to think about their feet. How do we use our feet? What can we do? What about an animal's feet? Ask the students to describe an animal and its feet. How do these different feet help the animal thrive in its home?

Step 2 Distribute the Neat Feet activity sheet. Tell students these are the footprints of animals that live in Australia. Challenge the students to match each foot in the middle to an animal's name in the left column and an action in the right column.

Step 3 When the students have completed the matching, show pictures of the koala, wallaby, kookaburra, wombat, and crocodile. With each, discuss what kind of feet they have and how they use their feet.

Step 4 After this discussion, ask the students to work in groups to correct any matches that are not correct. Encourage discussions as to why students are making a change.

Step 5 When the revisions are completed, and students are ready, double-check answers as a class. Review each animal, encouraging the students to roleplay the action the animal's feet perform. Can human feet do just as well?

I WONDER . . .

Do all animals have feet? Can you name an animal that doesn't? How do they move?

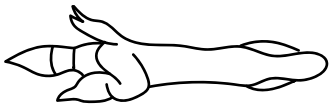
GRADE
3

Neat Feet Activity

INSTRUCTIONS

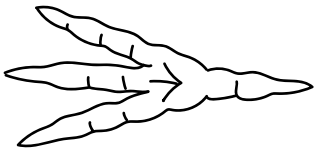
Match the animal name to the foot.
Match the foot to the action word.

WOMBAT



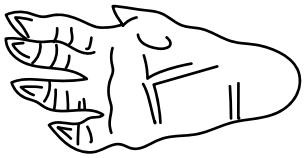
CLIMB

WALLABY



DIG

KOOKABURRA

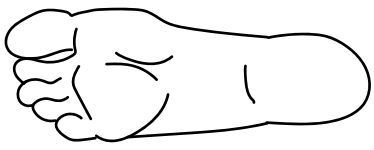


SWIM

CROCODILE

HOP

KOALA



GRAB

HUMAN

WALK

Resources

Learn more about San Diego Zoo Wildlife Alliance's Australian Forest Conservation Hub at sandiegozoowildlifealliance.org/conservation-hub/australian-forest.

Watch koalas live on Koala Cam at zoo.sandiegozoo.org/cams/koala-cam.

Learn more about koalas at animals.sandiegozoo.org/animals/koala.

Explore the San Diego Zoo Wildlife Explorers website at sdzwildlifeexplorers.org.

Learn more about the San Diego Zoo at sandiegozoo.org.

Learn more about the San Diego Zoo Safari Park at sdzsafaripark.org.

Learn more about our global conservation efforts at sandiegozoowildlifealliance.org.

Connections to the Next Generation Science Standards

The materials and activities presented in this guide are just one step toward reaching the standards and performance expectations listed below.

STANDARDS

LS1	From Molecules to Organisms: Structures and Processes
LS2	Ecosystems: Interactions, Energy, and Dynamics
LS3	Heredity: Inheritance and Variation of Traits
LS4	Biological Evolution: Unity and Diversity
ESS3	Earth and Human Activity

PHOTO CREDITS

Emu photo: nmulconray/ iStock/ Getty Images Plus

Grassland photo: neil bowman/ iStock/ Getty Images Plus

Baby emu photo: diegograndi/ iStock/ Getty Images Plus

Young tasmanian devilphoto: Satheesh Rajh Rajagopalan/ iStock/Getty Images Plus

Juvenile laughing kookaburra photo: tracielouise/iStock/Getty Images Plus

Chick laughing kookaburra photo: Nataliia Seliunina/ iStock/ Getty Images Plus

Saltwater crocodile photos: *location credit: Dreamworld*

Juvenile saltwater crocodile photo: Kirsty Nadine/iStock/Getty Images Plus

Eggs saltwater crocodile photo: folgt/iStock/Getty Images Plus

baby saltwater crocodile photo: aussiesnakes/iStock/Getty Images Plus

PERFORMANCE EXPECTATIONS

Kindergarten: K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive

Dimension	Name or NGSS Citation	Student task(s) in activity
Science and Engineering Practices	LS1.C Organization for Matter and Energy Flow in Organisms	Students recognize that koalas eat only eucalypt leaves.
Disciplinary Core Ideas	LS1.C Organization for Matter and Energy Flow in Organisms	Students recognize that koalas eat only eucalypt leaves.
Cross-cutting Concepts	Patterns	Students discuss the similar needs (food, water, shelter) between koalas and themselves.

Kindergarten: K-ESS3-1 **performance expectation:** Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.

Dimension	Name or NGSS Citation	Student task(s) in activity
Science and Engineering Practices	Developing and Using Models	Students create diagrams of relationships between animals and the places where they live.
Disciplinary Core Ideas	ESS3.A Natural Resources	Students identify an animal's food, shelter, and source of water in various habitats.
Cross-cutting Concepts	Systems and System Models	Students recognize that animals, plants, and the environment have parts that work together.

PERFORMANCE EXPECTATIONS

Grade 1: 1-LS3-1

performance expectation: Make observations to construct an evidence-based account that young plants and animals are alike, but not exactly alike, their parents.

Dimension	Name or NGSS Citation	Student task(s) in activity
Science and Engineering Practices	Constructing Explanations and Designing Solutions	Students examine and analyze the common traits of three groups of animals.
Disciplinary Core Ideas	LS3.A Inheritance of Traits	Students recognize young inherit traits from parents by matching common animals together.
Cross-cutting Concepts	Patterns	Students identify repeating patterns and similar characteristics among the groups of animals.

Grade 2: 2-LS4-1

performance expectation: Make observations of plants and animals to compare the diversity of life in different habitats.

Dimension	Name or NGSS Citation	Student task(s) in activity
Science and Engineering Practices	Planning and Carrying Out Investigations	Students compare and analyze the variety of animals in Australia.
Disciplinary Core Ideas	LS4.D Biodiversity and Humans	Students identify the needs of animals as a criteria for diversity.
Cross-cutting Concepts	None	None

PERFORMANCE EXPECTATIONS

Grade 3: 3-LS4-3

performance expectation: Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

Dimension	Name or NGSS Citation	Student task(s) in activity
Science and Engineering Practices	Engaging in Argument from Evidence	Students construct an argument for which foot would best assist various animals in their habitat.
Disciplinary Core Ideas	LS4.C Adaptation	Students realize that animal body parts and behavior help them live in their environment.
Cross-cutting Concepts	Cause and Effect	Students describe how animals use their body and behaviors to gather what they need to survive.

Grade 3: 3-LS3-1

performance expectation: Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variations of these traits exist in a group of similar organisms.

Dimension	Name or NGSS Citation	Student task(s) in activity
Science and Engineering Practices	Analyzing and Interpreting Data	Students examine images of adult and young animals, recognizing similar traits between related species.
Disciplinary Core Ideas	LS3.A Inheritance of Traits	Students construct the life sequences of four animals, using the inheritance of similar traits as criteria.
Cross-cutting Concepts	Patterns	Students identify repeating patterns and similar characteristics among the groups of animals.

Glossary

A

Aboriginal
People, animals, or plants native to Australia.

Adaptation
A characteristic of a living thing that helps it survive in its environment.

altricial
Helpless at birth; requiring a great amount of parental care.

arboreal
An animal that lives in trees.

Australia
A country and continent in the southern hemisphere in the southwestern Pacific Ocean.

B

billabong
Pool of isolated water that forms when a river changes course.

C

carnivore
An animal that eats other animals.

characteristic
A typical quality or feature.

E

endangered species
A plant or animal that is seriously at risk of becoming extinct.

environment
The natural world of the land, sea, and air.

eucalypt
(yoo-kuh-lipt) Any of the several trees in the genera Eucalyptus, Corymbia, and Angophora, also called gum trees.

H

habitat
The place and natural conditions in which a plant or animal lives.

herbivore
An animal that eats only plants.

J

joey
A baby marsupial.

L

life cycle
The development stages a living thing goes through from birth to death—birth, sprouting, or hatching; growing and changing; adulthood; and reproducing.

M

mammal
Warm-blooded vertebrate animals that have hair or fur on their bodies and feed milk to their young.

marsupial
Several orders of mammals characterized by the presence of marsupial bones. In most species (such as the koala), females carry newborn offspring in a pouch.

monotreme
An order of mammals that lays eggs.

N

nocturnal
Most active at night.

O

omnivore
An animal that feeds on plants and animals.

oviparous
Reproduction by producing eggs that hatch outside the female's body. Young are nourished by yolk sacs.

ovoviviparous
Reproduction by producing eggs that hatch inside the female's body. After hatching, young are born alive. Young are nourished by yolk sacs, not through a placenta.

P

pouch
Folds of skin or a pocket-like opening on the underbelly of female marsupials that covers the teats, where young are raised and nurtured.

precocial
Prepared for life immediately upon hatching or being born, but usually still requiring at least some parental care.

predator
An animal that hunts other animals for food.

prey
An animal that is hunted by another animal for food.

V

viviparous
Reproduction by giving live birth. Embryos are nourished by a connection to the female's placenta.

San Diego Zoo
Wildlife
Explorers