

# THE GABOON VIPER EXERCISE

## Student Resource 1: Unit 1



Looking at this Gaboon viper, predict how its physical features may influence its growth and survival?

What type of habitat do you predict the Gaboon viper calls home? Why?

How do you think this viper collects its food source?

After reading "The Gaboon Viper" reflect on the following questions. For question 2, you should be able to provide at least 3 examples.

1. The Gaboon viper breathes oxygen through its lungs; in what other way does the viper use its lungs? How does that effect its survival?

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2. What physical characteristics did you learn about that effect the viper's growth, survival, behavior, and/or reproduction?

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To see an animal that calls the leafy rainforest floor its home, you don't have to leave Louisville to spot...

## THE GABOON VIPER

### Student Resource 2: Unit 1

The Louisville Zoo's HerpAquarium is home to this really big terrestrial (living on the ground) reptile.

The Gaboon viper has several adaptations that have enabled it to survive in different habitats including tropical rainforests. Size is an adaptation that these snakes utilize. When you think of Gaboon vipers, you need to think BIG! Nearly everything about them is big, and their size plays a key role in their ability to survive in this environment. One of the first things you will notice about these vipers is their large bodies, both the length and girth. A more substantial body enables them to consume prey that many other snakes can't manage; their hefty size also provides space for a large respiratory system which the Gaboon uses to deter potential predators. When confronted by a predator, Gaboons will inflate their lungs full of air enabling them to emit a very loud, long and frightening hiss that causes most animals to flee, including humans!

In addition to being very thick-bodied and able to grow over six feet in length, Gaboon vipers also have very big heads, an adaptation that serves multiple purposes. First of all, there are many plants with large leaves in tropical rainforests that end up falling to the forest floor; the size and shape of the Gaboon viper's head makes it blend in with the leafy forest floor providing very effective camouflage. Secondly, a big head allows the Gaboon viper to accommodate the longest fangs of any snake in the entire world plus enormous venom glands. There are other snakes that have venom that is more potent than the Gaboon vipers, but the large glands enable this snake to



inject prey with the highest venom yields of any species of snake on the planet. Having such long fangs also enables them to inject their venom very deep into a prey animal which makes it faster-acting and more effective. Many venomous snakes strike a prey animal and then release it, but not the Gaboon viper. Instead, they often bite and hold their prey, allowing them to pump their prey full of venom for a quicker kill.

Long-term survival and vigorousness of the species depends on superior size — reproduction would be compromised without it. Before Gaboon vipers reproduce, the males engage in combat with each other, and only those that survive go on to produce offspring. During combat, males begin by rubbing their chins along the back of their opponents raising their heads up as high as they can while becoming intertwined in an effort to physically topple each other over. Large size provides a distinct advantage in this competition. In order to achieve a size advantage, males must succeed in finding food over a long period of time — the reward being a larger size enabling them to pass on their successful genes to the next generation. The rigors of this process demonstrate how adaptations are rewarded through evolution in the natural world.

# FROGFISH EXERCISE

Student Resource 3: Unit 1



Looking at the photograph make a prediction about how this frogfish gets its food source.

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NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

## OVERVIEW

A fish swishes through the water just above a cluster of coral on the seafloor. Suddenly a hairy-looking, bloblike creature emerges from the coral, snags the fish in its mouth, and devours the snack. The bizarre being isn't a mythical sea monster — it's a hairy frogfish. And its appearance isn't its only odd trait.

## WALK IT OFF

The hairy frogfish is a type of fish that's covered in spines. These spines, which resemble strands of hair, allow the marine animal to camouflage itself against coral and seaweed. Found mostly in warm waters around the world, the hairy frogfish can also change its color to blend in with its surroundings.

These animals may be excellent at hiding in plain sight. However they do something that really makes them stand out from a lot of other sea creatures. The fish — which usually grow about four inches long — don't swim. Instead they walk on their wide fins along the seafloor as they look for snacks to eat.

## GO FISH

When it comes to meals, hairy frogfish aren't too picky. They chow down crustaceans and other fish such as flounder. These guys sometimes sneak up on their prey. But other times they make their prey come to them. Hairy frogfish have a special extra-long spine on their dorsal fins that looks like a worm. By waving this bait back and forth in front of their mouths, they can lure a target within striking distance. Talk about being put in a hairy situation!

Be prepared to share the interesting feeding methods of the frogfish. Make sure to describe what features makes its strange feeding habits possible!

**<http://kids.nationalgeographic.com/animals/hairyfrogfish/#hairy-frogfish-side.jpg>**

# MAINTIS SHRIMP EXERCISE

Student Resource 4: Unit 1



Looking at the photograph make a prediction about how this mantis shrimp gets its food source.

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NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

## **OVERVIEW**

A rainbow-colored crustacean skitters along the ocean floor, adding a splash of brightness to the murky setting. The animal's narrow, hard-shelled body sports orange, green, red, and blue hues. Known as the peacock mantis shrimp, this beautiful, seven-inch-long critter looks harmless. But the marine animal packs a punch — literally.

## **SHRIMP SMACKDOWN**

Peacock mantis shrimp mostly live in shallow parts of the Indian and Pacific Oceans. The crustacean spends much of its time looking for crabs and mollusks to eat. When it finds a delicious-looking snack, the animal goes into full-on boxer mode. Springing out one of its club-like front claws, the animal delivers a swift punch to its prey. The punch is 50 times faster than the blink of an eye and strong enough to break glass!

These shrimp also rely on their sparing moves to keep enemies away from burrows in the ocean floor that they use as shelters. Hovering at the opening of its burrow, a peacock mantis shrimp will strike at intruders that come too close.

## **EYES ON THE PRIZE**

The crustacean has another eye-popping feature in addition to its strong punch. Its eyes — which protrude from its head and move independently — can see in two different directions at once. They can also detect colors that humans are unable to see. It's easy to be floored by this animal's cool traits!

Be prepared to share the interesting feeding methods of the Mantis Shrimp. Make sure to describe what features makes its strange feeding habits possible!

<http://kids.nationalgeographic.com/animals/peacockmantisshrimp/#mantis-shrimp-profile.jpg>

# NUDIBRANCH EXERCISE

Student Resource 5: Unit 1



Looking at the photograph make a prediction about how this nudibranch gets its food source.

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NAME: \_\_\_\_\_

DATE: \_\_\_\_\_



## OVERVIEW

A blob the size of a teacup slinks along the ocean floor in the shallow waters off of Australia.

It's a type of sea slug called the nudibranch (NEW-dih-bronk), a slime-oozing creature with a boneless body. Many of them also sport brilliant colors and eye-catching patterns on their skin. In fact this sticky slug is often considered one of the most beautiful animals in the world.

## IN THE MOOD FOR FOOD

Over 3,000 species of nudibranchs exist, and most live in shallow, tropical waters. They can be anywhere from a quarter of an inch to 12 inches long and can weigh up to 3.3 pounds. These sea slugs spend their time sliding on their bellies around their habitat in search of snacks. The animals have a set of curved teeth, which they use to eat coral, sponges, and fish eggs off the ocean floor. Nudibranchs use tentacles on their heads to poke around for grub.

## TRUE COLORS

The nudibranch's meals don't just satisfy its hunger — the food also gives the animal its coloring. When the sea slug eats, it absorbs and displays its prey's pigment — the substance that gives the prey its color. Some nudibranchs also absorb toxins from certain prey and secrete the poison from their own skin. This allows them to fend off enemies such as fish. So the nudibranch is stunning, resourceful, and it recycles? This slug sounds far from sluggish!

Be prepared to share the interesting feeding methods of the nudibranch. Make sure to describe how its physical are impacted!

[http://kids.nationalgeographic.com/animals/nudibranch/#nudibranch\\_white.png](http://kids.nationalgeographic.com/animals/nudibranch/#nudibranch_white.png)

# PEREGRINE FALCON EXERCISE

Student Resource 6: Unit 1



Looking at the photograph make a prediction about how this peregrine falcon gets its food source.

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NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

## OVERVIEW

Swoosh! A peregrine falcon can dive up to 200 miles (323 kilometers) an hour to capture prey in flight, striking in midair with its outstretched talons, or claws. Peregrines usually hunt with either a swift chase or a fast dive. Starlings, pigeons, and doves are among their favorite meals.

A common bird of prey (a group of hunting birds that includes such birds as hawks and eagles), the peregrine is an adaptable falcon that can be found in almost any habitat. Peregrines live from cold tundra to hot deserts, from sea level to high in the mountains. Their adaptability even allows them to thrive in cities. They live in a greater variety of habitats than almost any other bird of prey. Some peregrine falcons migrate in the winter from their nesting grounds in the Arctic all the way to South America—a round-trip distance of up to 15,500 miles (24,945 kilometers). They make the return trip north when it's time to mate and lay eggs.

Peregrines don't build nests. They usually just find a shallow dip in some rocks or scrape a depression in the soil on the ledge of a cliff, or even use the ledge of a building. Female peregrines lay two to four eggs at a time. Parents incubate the eggs for about a month until the eggs hatch. Peregrine chicks stay in the nest for up to six weeks, by which time they've learned to fly.

Peregrine falcons in the United States were listed as an endangered species after their numbers dropped dangerously low between the 1950s and the 1970s. Certain pesticides used by farmers—including DDT—harmed the peregrines by causing their eggshells to be dangerously thin—so fragile that they broke when the parents tried to incubate them. Laws were enacted to ban DDT and, fortunately the ban, along with other conservation efforts, led to the recovery of the species. In fact, scientists think there now may be more peregrines in some parts of their range than there ever used to be!

Be prepared to share the interesting feeding methods of the peregrine falcon. Make sure to describe what features makes its strange feeding habits possible!

<http://kids.nationalgeographic.com/animals/peregrine-falcon/#peregrine-falcon-wings-extended.jpg>

# CHAMELEON EXERCISE

Student Resource 7: Unit 1



Looking at the photograph make a prediction about how this chameleon gets its food source.

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NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

## **OVERVIEW**

A chameleon sits motionlessly on a tree branch. Suddenly its sticky, two-foot-long tongue snaps out at 13 miles an hour, wrapping around a cricket and whipping the yummy snack back into the reptile's mouth. Now that's fast food dining! And the chameleon's swift eating style is just one of its many features that'll leave you tongue-tied.

## **COLORFUL CRITTERS**

Chameleons mostly live in the rain forests and deserts of Africa. The color of their skin helps them blend in with their habitats. Chameleons that hang out in trees are usually green. Those that live in deserts are most often brown.

They often change color to warm up or cool down. (Turning darker helps warm the animals because the dark colors absorb more heat.) They also switch shades to communicate with other chameleons, using bright colors to attract potential mates or warn enemies.

So how exactly do chameleons change colors? The outer layer of their skin is see-through. Beneath that are layers of special cells filled with pigment—the substance that gives plants and animals (including you) color. To display a new color, the brain sends a message for these cells to get bigger or smaller. As this happens, pigments from different cells are released, and they mix with each other to create new skin tones. For instance, red and blue pigment may mix to make the chameleon look purple.

## **EYES EVERYWHERE**

Over 150 species of chameleons exist, ranging from the size of your thumbnail to that of a house cat. Some species of chameleon (such as the tiger chameleon) are endangered, but others (like the Drakensberg dwarf chameleon) are not. No matter their differences, all chameleons have a prize pair of eyes. Their peepers can move in two different directions at once, giving the lizards a panoramic view of their surroundings. This eye-popping reptile really knows how to scale up the cool factor.

Be prepared to share the interesting feeding methods of the chameleon. Make sure to describe what features makes its strange feeding habits possible!

<http://kids.nationalgeographic.com/animals/chameleon/#chameleon-sleepy.jpg>

# THORNY DEVIL EXERCISE

Student Resource 8: Unit 1



Looking at the photograph make a prediction about how this thorny devil gets its water source.

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NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

It's early morning in the Australian desert, and a squat, palm-sized lizard called the thorny devil is having a drink. It hasn't rained for weeks, and there's no water in sight. The lizard's body is still and its head is raised. And yet, through almost no effort, it is quenching its thirst.

Its secret lies in its extraordinary skin. Between the intimidating and ostentatious spikes, there's a subtle network of microscopic grooves. These can yank water out of moist sand, drawing the fluid up against the pull of gravity, across the lizard's body, and into its waiting mouth. All it needs to do is to stand in the right spot and without flexing a muscle, it can drink with its skin.

Be prepared to share how the thorny devil is able to get its water source in its very dry habitat.

<https://www.theatlantic.com/science/archive/2016/11/this-lizard-can-drink-by-standing-still-in-sand/506288/>

# DESERT TORTOISE EXERCISE

Student Resource 9: Unit 1



Looking at the photograph make a prediction about how this Desert Tortoise gets its water source.

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NAME: \_\_\_\_\_

DATE: \_\_\_\_\_



## OVERVIEW

Five eggs the size of Ping-Pong balls crack open as the tiny desert tortoises inside break through the shells. The two-inch-long babies immediately crawl off in search of flowers and grasses to eat. These animals may be newly hatched, but they already have survival skills that will allow them thrive in their harsh, sizzling-hot habitats.

## BURROW BUILDERS

Desert tortoises live in the deserts of the southwestern United States and northwestern Mexico. During the summer, ground temperatures in parts of their range can hit 140°F. To beat the heat, desert tortoises use their strong forearms and tough nails to dig underground burrows where they can hide from the sun. Some of these tortoise tunnels are up to 32 feet in length. And the burrows can get pretty crowded.

As many as 25 desert tortoises might bunk together in one shelter.

The animals also dig grooves into on the ground's surface to catch rainwater. After a storm, they'll return to these holes to slurp up the water that's collected inside. Once it's had a good drink, a desert tortoise can go up to a year without requiring fresh water again. The reptile stores the water it has consumed in its bladder and can later absorb the liquid when it needs to hydrate.

## TORTOISE TUSSLE

Despite sometimes hanging out in burrows together, desert tortoises are pretty solitary. And sometimes when males come across each other, they'll fight to establish dominance. The dueling duo may use horns on their chests to try and knock each other over. The contest ends when one animal flips the other on its back. The losing tortoise can turn right side up by wiggling its body back and forth until it flips over. But after that, the tortoise knows who's boss. Sounds like a tortoise's shell isn't the only thing about it that's tough!

Be prepared to share how the desert tortoise is able to get its water source in its very dry habitat.

<http://kids.nationalgeographic.com/animals/deserttortoise/#deserttortoiseeating.jpg>



## FOREST ECOSYSTEMS

### Student Resource 10: Unit 1

Forest ecosystems are classified according to their climate type as tropical, temperate or boreal. In the tropics, rainforest ecosystems contain more diverse vegetation than ecosystems in any other region on earth. In these warm, moisture-rich environments, trees grow tall and greenery is lush and dense, with species living from the forest floor all the way up to the canopy. In temperate zones, forest ecosystems may be deciduous, coniferous or oftentimes a mixture of both, in which some trees shed their leaves each fall, while others remain evergreen year-round. In the far north, just south of the Arctic, boreal forests -- also known as taiga -- feature abundant coniferous trees.

<http://sciencing.com/types-environmental-ecosystems-8640.html>

### Think about it...

- What are the external features of this creature? Internal?
- Why are these features needed in this habitat?
- What does this creature eat?
- What does this creature do during the day? Or is it nocturnal?
- Does this creature have any natural predators?
- How does your creature protect itself from predators?
- Does your creature live on land or in water? A combination?
- How does your animal drink water?

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

## Creature

Using the information about forest ecosystems and what you have learned about how other animals acquire their necessary resources, design your own forest dwelling creature!

Be sure to label any internal or external structures that support its survival, and provide a brief explanation of your creature in the space provided.

## Explanation

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## GRASSLAND ECOSYSTEMS

### Student Resource 11: Unit 1

Different types of grassland ecosystems can be found in prairies, savannas and steppes. Grassland ecosystems are typically found in tropical or temperate regions, although they can exist in colder areas as well, as is the case with the well-known Siberian steppe. Grasslands share the common climatic characteristic of semi-aridity. Trees are sparse or nonexistent, but flowers may be interspersed with the grasses. Grasslands provide an ideal environment for grazing animals.

<http://sciencing.com/types-environmental-ecosystems-8640.html>

### Think about it...

- What are the external features of this creature? Internal?
- Why are these features needed in this habitat?
- What does this creature eat?
- What does this creature do during the day? Or is it nocturnal?
- Does this creature have any natural predators?
- How does your creature protect itself from predators?
- Does your creature live on land or in water? A combination?
- How does your animal drink water?

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

## Creature

Using the information about forest ecosystems and what you have learned about how other animals acquire their necessary resources, design your own grassland dwelling creature!

Be sure to label any internal or external structures that support its survival, and provide a brief explanation of your creature in the space provided.

## Explanation

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## TUNDRA ECOSYSTEMS

### Student Resource 12: Unit 1

As with deserts, a harsh environment characterizes ecosystems in the tundra. In the snow-covered, windswept, treeless tundra, the soil is frozen year-round, a condition known as permafrost. During the brief spring and summer, snows melt, producing shallow ponds which attract migrating waterfowl.

Lichens and small flowers may become visible during this time of year. The term “tundra” most commonly denotes polar areas, but at lower latitudes, tundra-like communities known as alpine tundra may be found at high elevations.

<http://sciencing.com/types-environmental-ecosystems-8640.html>

### Think about it...

- What are the external features of this creature? Internal?
- Why are these features needed in this habitat?
- What does this creature eat?
- What does this creature do during the day? Or is it nocturnal?
- Does this creature have any natural predators?
- How does your creature protect itself from predators?
- Does your creature live on land or in water? A combination?
- How does your animal drink water?

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

## Creature

Using the information about forest ecosystems and what you have learned about how other animals acquire their necessary resources, design your own tundra dwelling creature!

Be sure to label any internal or external structures that support its survival, and provide a brief explanation of your creature in the space provided.

## Explanation

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## DESERT ECOSYSTEMS

### Student Resource 13: Unit 1

The common defining feature among desert ecosystems is low precipitation, generally less than 25 centimeters (10 inches) per year. Not all deserts are hot -- desert ecosystems can exist from the tropics to the arctic, but regardless of latitude, deserts are often windy. Some deserts contain sand dunes, while others feature mostly rock. Vegetation is sparse or nonexistent, and any animal species, such as insects, reptiles and birds, must be highly adapted to the dry conditions.

<http://sciencing.com/types-environmental-ecosystems-8640.html>

### Think about it...

- What are the external features of this creature? Internal?
- Why are these features needed in this habitat?
- What does this creature eat?
- What does this creature do during the day? Or is it nocturnal?
- Does this creature have any natural predators?
- How does your creature protect itself from predators?
- Does your creature live on land or in water? A combination?
- How does your animal drink water?

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_



## Creature

Using the information about forest ecosystems and what you have learned about how other animals acquire their necessary resources, design your own desert dwelling creature!

Be sure to label any internal or external structures that support its survival, and provide a brief explanation of your creature in the space provided.

## Explanation

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## FRESHWATER ECOSYSTEMS

### Student Resource 14: Unit 1

Freshwater ecosystems can be found in streams, rivers, springs, ponds, lakes, bogs and freshwater swamps. They are subdivided into two classes: those in which the water is nearly stationary, such as ponds, and those in which the water flows, such as creeks. Freshwater ecosystems are home to more than just fish: algae, plankton, insects, amphibians and underwater plants also inhabit them.

<http://sciencing.com/types-environmental-ecosystems-8640.html>

### Think about it....

- What are the external features of this creature? Internal?
- Why are these features needed in this habitat?
- What does this creature eat?
- What does this creature do during the day? Or is it nocturnal?
- Does this creature have any natural predators?
- How does your creature protect itself from predators?
- Does your creature live on land or in water? A combination?
- How does your animal drink water?

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

## Creature

Using the information about forest ecosystems and what you have learned about how other animals acquire their necessary resources, design your own freshwater dwelling creature!

Be sure to label any internal or external structures that support its survival, and provide a brief explanation of your creature in the space provided.

## Explanation

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## MARINE ECOSYSTEMS

### Student Resource 15: Unit 1

Marine ecosystems differ from freshwater ecosystems in that they contain saltwater, which usually supports different types of species than does freshwater. Marine ecosystems are the most abundant types of ecosystems in the world. They encompass not only the ocean floor and surface but also tidal zones, estuaries, salt marshes and saltwater swamps, mangroves and coral reefs.

<http://sciencing.com/types-environmental-ecosystems-8640.html>

### Think about it....

- What are the external features of this creature? Internal?
- Why are these features needed in this habitat?
- What does this creature eat?
- What does this creature do during the day? Or is it nocturnal?
- Does this creature have any natural predators?
- How does your creature protect itself from predators?
- Does your creature live on land or in water? A combination?
- How does your animal drink water?

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

## Creature

Using the information about forest ecosystems and what you have learned about how other animals acquire their necessary resources, design your own marine dwelling g creature!

Be sure to label any internal or external structures that support its survival, and provide a brief explanation of your creature in the space provided.

## Explanation

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# Look What I Read About

Student Resource 1: Unit 2

A Report About \_\_\_\_\_

by \_\_\_\_\_

## FIVE FACTS

## THE MOST IMPORTANT THING I LEARNED

## ILLUSTRATION

## ONE MORE THING ABOUT THIS TOPIC

## IMPORTANT IDEA #1

## IMPORTANT IDEA #2

## IMPORTANT IDEA #3

NAME: \_\_\_\_\_

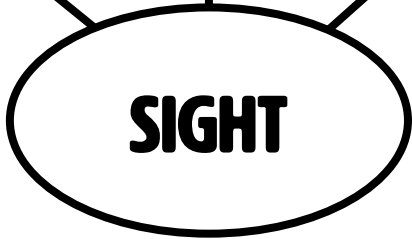
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# Expository Essay Graphic Organizer

Student Resource 2: Unit 2

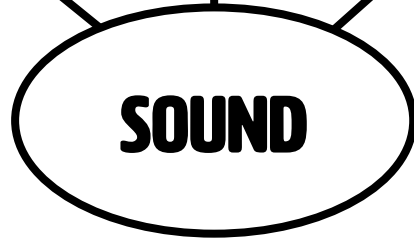
*3 Interesting Facts*

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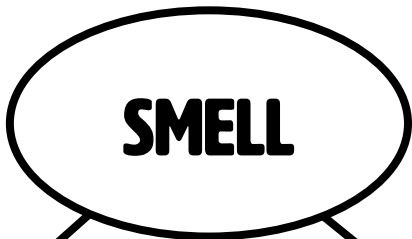


*3 Interesting Facts*

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## **ANIMAL SENSES**



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*3 Interesting Facts*



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*3 Interesting Facts*

