# REPTILES, AMPHIBIANS, AND FISH



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# UNIT INFORMATION

#### **Student Journal**



All The Good and the Beautiful science units include activities in a student journal. Each student should have his or her own student journal, and the parent or teacher will direct

the student regarding when to complete the activities as directed in the lessons. Science journals can be purchased by going to **goodandbeautiful.com/science** and clicking on the *Reptiles, Amphibians, and Fish* unit link.



#### **Science Wall**

All The Good and the Beautiful science units include vocabulary words to be placed on your science wall, which is a wall or tri-fold

presentation board in your learning area on which you can attach the vocabulary words and other images. *Cut out the vocabulary word cards at the beginning of the unit.* The course will indicate when to place them on the wall.

### **Lesson Preparation**



All The Good and the Beautiful science units include easy-to-follow lesson preparation directions at the beginning of each lesson.

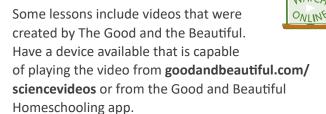
### **Activities and Experiments**



Many of The Good and the Beautiful science lessons involve hands-on activities and experiments. An adult should always closely supervise children as they participate in the

activities and experiments to ensure they are following all necessary safety procedures.

#### **Unit Videos**



### **Content for Older Children**



Some lessons include extra content that is more applicable for older children (grades 7–8). Parents or teachers may choose to skip this content if instructing only younger children.

## **Content for Younger Children**



Some lessons include extra content that is more applicable for younger children (grades 3-6). Parents or teachers may choose to skip this content if instructing only older children.

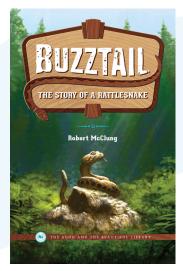
### **Versions**

New discoveries are being made on an ongoing basis. This course is reviewed and revised periodically to keep information as up-to-date as possible. This version is the second edition of this unit.

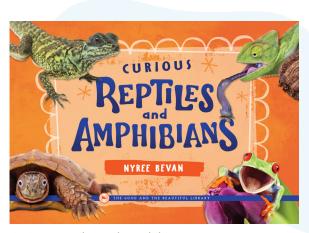


# READ-ALOUD BOOK PACK

The books below are optional read-aloud books that complement this unit. These books can be purchased as a book pack by going to **goodandbeautiful.com/science** and clicking on the *Reptiles, Amphibians, and Fish* unit.



Buzztail: The Story of a Rattlesnake by Robert McClung



Curious Reptiles and Amphibians by Nyree Bevan



# **CORRELATED BOOKS**

The Good and the Beautiful Library has several books that correlate well with the *Reptiles, Amphibians, and Fish* unit. It can be a wonderful experience for children to read books on their levels related to the subjects they are learning in science. The library includes both fiction and nonfiction books organized according to reading level. Find the correlated books by going to **goodandbeautiful.com/science** and clicking on the *Reptiles, Amphibians, and Fish* unit.

Each lesson has an optional lesson extension for children in grades 7–8. Complete the lesson with all the children and then have the older children complete the self-directed lesson extension. These extensions are located in the 7–8 student journal.

The answer key for the lesson extensions can be found on the Good and Beautiful Homeschooling app in the science section. Visit **goodandbeautiful.com/apps** for information on accessing the app. The app can be accessed from a computer, phone, or tablet.

The amount of time it will take to complete each lesson extension will vary for each child. The average time is about 10–15 minutes per extension. Parents/teachers and children may choose to omit parts of the lesson extension if desired. Encourage the children to stretch their capabilities, but also reduce work if needed.

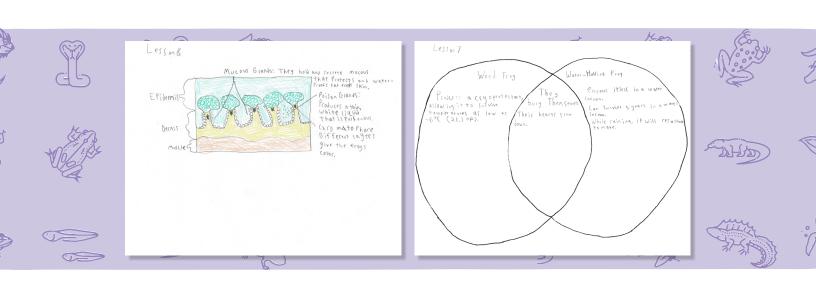
Some of the grades 7–8 lesson extensions have the children summarize the material read. Teach the children to look for key information, summarizing the most important points. Students can also add notes with their thoughts and the facts that are most interesting to them.

# **Optional Grades 7–8 Reading Book**

We recommend *The Reptiles, Amphibians, and Fish Questions & Answers Book* as extra reading for students in grades 7–8. This book can be purchased by going to **goodandbeautiful.com/science** and clicking on the *Reptiles, Amphibians, and Fish* unit.



The Reptiles, Amphibians, and Fish Questions & Answers Book by Meg Jenkins



# SUPPLIES NEEDED

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#### Lesson 1

- Flashlight for each child (optional)
- Tape
- Body temperature thermometer
- Air temperature thermometer or house thermostat
- A device with a weather app

#### Lesson 2

- Scissors
- Tape

# Lesson 3

 1 game marker for each player (a coin, bean, pebble, etc.)

#### Lesson 4

- White school glue
- Scissors
- Glue stick

# Lesson 5

White school glue or glue stick

#### Lesson 6

Colored pencils or markers in blue, green, and brown

# Lesson 7

Colored pencils

#### Lesson 8

- 1 party blower or noisemaker or straw per child
- · Roll of masking tape, painter's tape, or duct tape
- Glue stick
- Device with a weather app

#### Lesson 9

- 2 freezable plastic containers, with lids, big enough to hold 1 c of liquid
- 1 c water
- Permanent or dry-erase marker
- 1 c maple or corn syrup

## Lesson 10

- 2 hard-boiled eggs (leave shell on one of the eggs)
- Food coloring (any color)
- 2 glasses
- Tap water

### Lesson 11

- Glue stick
- 2 Tbsp ground coffee or black pepper
- Paper coffee filter
- 2 clear cups
- A rubber band
- Water

#### Lesson 12

Glue

#### Lesson 13

None



**Instructions:** Cut out the vocabulary cards in this section. Place them on your science wall when prompted to do so in the lessons. Review the vocabulary words several times during this unit and, if desired, at various times throughout the school year.

# Reptiles



vertebrates that have scaly skin, are ectothermic, breathe oxygen using lungs, and lay eggs



# **Amphibians**

vertebrates that have wet skin, can live in water or on land, are ectothermic, and typically breathe oxygen through their skin, gills when young, and lungs as an adult

# Fish



an aquatic vertebrate that is covered in scales, usually has fins, is ectothermic, and breathes oxygen through gills





an animal having vertebrae or backbones

# **Ectotherm**

an animal that depends on external sources for its body heat

# Venom

a toxin capable of causing injury or death through injection into prey

# Constrictor

a type of snake that wraps around and compresses its prey



# Permeable

having openings that liquids or gases can pass through

# Semipermeable

allowing certain substances to pass through

# **Tadpole**

aquatic frog larva that has an oval-shaped body; a long, flat tail; and gills

# Frogspawn

a cluster of frog eggs surrounded by a gelatinous material that floats on water



# REPTILES, AMPHIBIANS, AND FISH

Help the children learn about the different body features of reptiles, amphibians, and fish that enable them to live in various habitats.



### **Preparation:**

Before the lesson begins, cut out the "Hiker Hunt Cards" and place them throughout the room, allowing them to be partially visible. See the "Hiker Hunt Activity" for suggestions on where to place them.

# **Activity Supplies:**

- Flashlight for each child (optional)
- Tape
- Body temperature thermometer
- Air temperature thermometer or house thermostat
- A device with a weather app

### Introduction



Read to the children: Trekking through the lush, green Costa Rican rainforest, a hiker discovers a brilliant blue poison dart frog clinging to a tree trunk. Carefully

climbing down to the river's edge where the silver tilapia fish streak by, the hiker almost steps on a venomous sunshine-yellow snake.

What could the animals in these groups possibly have in common? They all have backbones and use external sources to control their body temperatures. From the slithering and slimy to the creepy and crawling, and on to the animals that move through the water with the greatest of ease, reptiles, amphibians, and fish are a fascinating group to study.



#### Science Wall



Place the vocabulary cards REPTILES, AMPHIBIANS, and FISH on your science wall. Read and discuss the words and definitions.



# **Hiker Hunt Activity**

and what you touch!



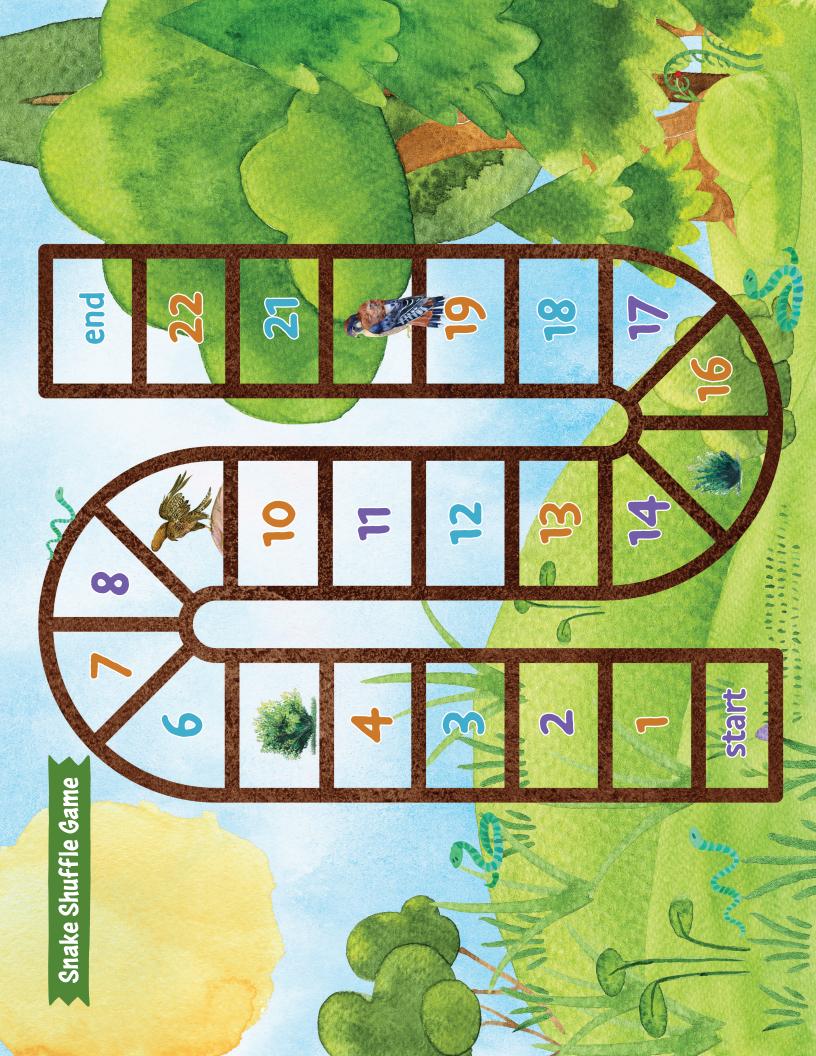
Read to the children: Let's imagine we are world-traveling hikers searching for interesting vertebrates (animals with backbones) living in the rainforest of Costa Rica. But beware: you might encounter some dangerous animals, so be careful where you step

# Hiker Hunt Cards









# Snake Shuffle Cards

# BONUS CARD!

Q: Can all snakes swim?

A: Yes

All snakes have the ability to swim from the time they hatch or are born.

Move ahead

spaces.

Q: True or False? Snakes cannot blink.

A: True

Snakes do not have eyelids, so they can't blink. Their eyes are protected by a transparent (clear) scale that covers the entire eye.

If answered correctly, move ahead



space.

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Q: True or False? Snakes can regulate their own body temperature internally.

A: False

Snakes are ectotherms, which are animals that rely on external sources, such as the sun, to regulate their body temperature. This is why snakes like to sunbathe on rocks!

If answered correctly, move ahead



space.

# BONUS CARD!

Q: Do snakes have to eat every day?

A: No

Snakes digest their food very slowly and have a very slow rate of metabolism, so they can go without food for days. Some snakes, like the king cobra, can survive for MONTHS between meals.

Move ahead



spaces.

Q: True or False? When a snake gets cold, it moves quickly to warm up.

A: False

When a snake gets cold, it slows down. Snakes aren't able to warm themselves up by moving faster or covering up like humans can. They must have an external source of warmth, such as the sun.

If answered correctly, move ahead



spaces.

space.

Q: Do constrictors kill by suffocating their prey?

A: Not usually. The squeezing cuts off the blood supply of their prey.

For a long time, we thought constricting snakes killed by cutting off the oxygen supply, but scientists recently learned that lack of blood circulation is the more accurate cause of death.

If answered correctly, move ahead



spaces.

Q: Do snakes chew their food?

A: No, they swallow their food whole.

Even though snakes have teeth, they don't use them for chewing food. Their teeth are pointed backward in their mouth to help them grip the food that they're swallowing.

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If answered correctly, move ahead



Q: Name two animals that prey on snakes.

A: Birds of prey, foxes, other reptiles, bobcats, raccoons, skunks, etc.

BONUS CARD!

Move ahead



spaces.

Objective

Help the children learn the distinguishing characteristics of lizards, identify several types of lizards from around the globe, and understand that lizards can live in most climates.





## **Preparation:**

- Cut out the "Locate-a-Lizard Cards."
- Cut out the lizard circles on the "Locate-a-Lizard World Map" in each student journal.

# **Activity Supplies:**

- White school glue
- Scissors
- Glue stick

### Lizard Facts

**Read to the children**: Take a look at this Indo-Chinese forest lizard. What type of animal do you think a lizard is? Lizards are reptiles!

- Most lizards have thick, scaly skin that can protect them from injury and help retain moisture.
- A few lizard species have a venomous bite!
- Some lizards live on land, and some spend most of their time in water.
- Lizards breathe oxygen with lungs and are ectothermic.

Lizards—fascinating, often quick-moving creatures—lead lives full of adventure. Some can leap through the tallest of trees, glide through water, or scramble across the hottest deserts. Around 5,000 different species of lizards make their homes in many habitats around the world. Like the other reptiles we have studied, when the air is cool, lizards have difficulty moving, so you may have seen one perched on a limb or rock as it absorbs the heat of the sun. With their quick movements, varied



colors, and flicking tongues, they are so unique that we marvel at their fun antics.

# Molting Activity



**Read to the children:** Lizards have some features that set them apart from other animals. One of their most visible traits is the thick, scaly skin that most lizards have. It

gives some protection from enemies and allows them to absorb a lot of sunlight while also keeping them from dehydrating too quickly.

# **Locate-a-Lizard Activity**





Have the children turn to the "Locate-a-Lizard World Map" activity in Lesson 4 of their student journals. Place the "Locate-a-Lizard Cards" facedown on the table in front of the children, and place the cut-out lizard circles faceup on the table near the cards. Read to the children: There are so many

varieties of lizards, and they have such diversity in color, size, shape, habits, and features. Let's take a look at some lizards and where they can be found in the world by playing a matching game. I will read the description, and you try to identify where in the world this lizard can be found.

Have a child select any card, keeping it facedown. Read the description on the card, but do not show the children the picture. In their student journals, have the children find the lizard circle that they think best matches the lizard card and locate where that lizard belongs on the map. Use the answer key to check the answers and make adjustments. Have the children glue the lizard circles onto the map page. An answer key for this activity can be found at the end of this lesson.

# The Lizard Lifestyle

Read to the children: Most lizards hatch from eggs that are laid by the mother, then buried underground or hidden beneath logs or rocks. However, some species give birth to live young. These lizards develop in eggs that are kept safe inside the mother's body until they hatch. Whichever way, baby lizards are born wriggling and hungry, and they are instinctively able to hunt

for themselves and hide from predators.

You may have seen a lizard flicking its tongue in and out. A lizard uses its tongue to test and smell the air



around it, often sensing a tasty meal nearby before it is seen. Some lizards use their tongues to grab prey

and bring it to their mouths. Others use their jaws for *prehension*, which means to grasp or hold something. For smaller lizards a meal may include mosquitoes, cockroaches, worms, or spiders. Large lizards, such as the African Nile monitor, crush birds, frogs, and small mammals with

their strong jaws. Depending on the species, lizards can be herbivores, carnivores, or omnivores.

Lizards are equipped to protect themselves from predators in amazing ways.

The frilled lizard has a ruffled-looking layer of skin around its

neck that it can spread outward when it encounters a possible predator. This makes it appear larger than it really is, and the predator often decides this fancy-collared, frilled reptile looks too daunting to be

devoured!



God equipped lizards with complex eyes that work to magnify what the lizard sees so that it can tell how far away another creature is. Even though some lizards have no eyelids and therefore cannot close their eyes, they have excellent vision, and some can even look in one direction with one eye and another direction with the other.

#### Lesson 4 Extension



Have children grades 7–8 complete the self-directed Lesson 4 extension titled "North America's Venomous Gila Monster" in their student journals.



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(Objective) .....

Help the children learn the differences between and characteristics of the different types of crocodilians.



# **Preparation:**

- Cut out the "Identifying Crocodilians Pictures."
- For younger children, cut out the labels for the "Compare-a-Croc Facts" page, found in the 3–6 student journal.

# **Activity Supplies:**

White school glue or glue stick

# Crocodilians

Read to the children: Have you ever wondered about the differences between alligators and crocodiles? Have you ever heard of gharials [GARE-ee-ulls] or caimans [CAY-mins]? All of these belong to an order of reptiles called *crocodilians*, a group of mysterious, ancient-looking creatures that have fascinated people for centuries. Some Ancient Egyptians kept crocodiles as pets, and they valued them greatly—they even had them embalmed and buried with the family in elaborate tombs.



Just like the Egyptians, we still find crocodiles and other crocodilians intriguing today. Perhaps it is because of the contrast we see in their activity—they can lie motionless for hours at a time, hardly moving a muscle, and then strike suddenly with immense power, keen precision, and deadly impact.

The members of the crocodilian order are similar in appearance, leading many people to think of them all as crocodiles. After a closer look at their bodies, behavior, and locations, you will see that they are each, in fact, very different animals.

■ Video: Crocodilians

Watch the video titled "Crocodilians" at goodandbeautiful.com/sciencevideos or from the Good and Beautiful Homeschooling app.



Identifying Crocodilians Activity



Lay the "Identifying Crocodilians Pictures" on a table. Have the children look at all the images as they listen to you read the following paragraphs aloud. Have the

children try to guess which image belongs to each description. An answer key for this activity can be found at the end of this lesson.

 A gharial is an Asian crocodilian that lives in fast-moving, freshwater rivers in India and Nepal. It is most distinguished by a long, thin snout with a bulbous tip. They eat mainly fish, which they can detect easily with special sensory cells that are located along the body. These sensory cells

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# FROGS AND TOADS AROUND THE WORLD

# Northern Leopard Frog

These frogs are native to North America and can be found living in ponds, marshes, swamps, and slowmoving streams. They eat mostly crickets, worms, flies, and other frogs, but their mouths are big enough to swallow even a small bird or a garter snake.



# Golden Poison Frog



Golden poison frogs are the largest of the poison dart frogs and live in South America. Their skin is coated in a poison called an alkaloid toxin, which can cause the intended target to have heart failure because the toxin stops the muscles from working. Their bright yellow color warns predators to stay away.

# Black Webbed Tree Frog

These Asian tree frogs have the ability to stretch their feet out and glide in the air using the strong webbing located between their toes. Their eggs are laid in aerial foam nests. The tadpoles hatch, drop from their eggs to the water below, and go through the stages of development from there.









Objective He

Help the children learn about the amphibian group Caudata, which contains salamanders and newts. Help the children understand how amphibians survive freezing temperatures.



### **Preparation:**

- The Lesson 9 activity will need to be continued the day after Lesson 9 is completed.
- Cut out the "True or False" cards.
- Note: You will need to hard-boil two eggs for the Lesson 10 "Permeable Skin Activity."

# **Activity Supplies:**

- 2 freezable plastic containers, with lids, big enough to hold 1 c of liquid
- 1 c of water

- Permanent or dry-erase marker
- 1 c of maple or corn syrup

# Caudate Amphibians



Read to the children: Axolotl [AK-suh-laa-tl], mudpuppy, hellbender, and siren. Would you ever think these are the common names for a bunch of amphibians? Belonging to a

group called *Caudata* [kah–DAY–tah], salamanders and newts are shaped like lizards but are actually related to frogs. Like frogs, salamanders and newts are born with gills, look just like tadpoles when they're in the larval stage, have semipermeable skin, and are ectothermic vertebrates. Newts and salamanders, however, do have one noticeable difference from frogs and toads. They keep their tails into adulthood.

There are around 750 species of newts and salamanders on our planet, but most people have never seen one! Where



can they be found? Salamanders and newts prefer cool, damp places and are often found tucked under leaf litter and logs in a quiet forest or in the muddy beds of freshwater streams, rivers, and creeks.

Let's take a look at some of these beautiful, mysterious creatures that live secretive lives, creeping on the forest floors and in our waterways.

# ■ Discovering Newts and Salamanders



Place the "True or False" cards on the table with the picture facing up. Read the statements on the "Discovering Newts and Salamanders" page and have the children

take turns deciding if each statement is true or false. Have them find the corresponding card and flip it over to see if they are correct, then read the additional information.

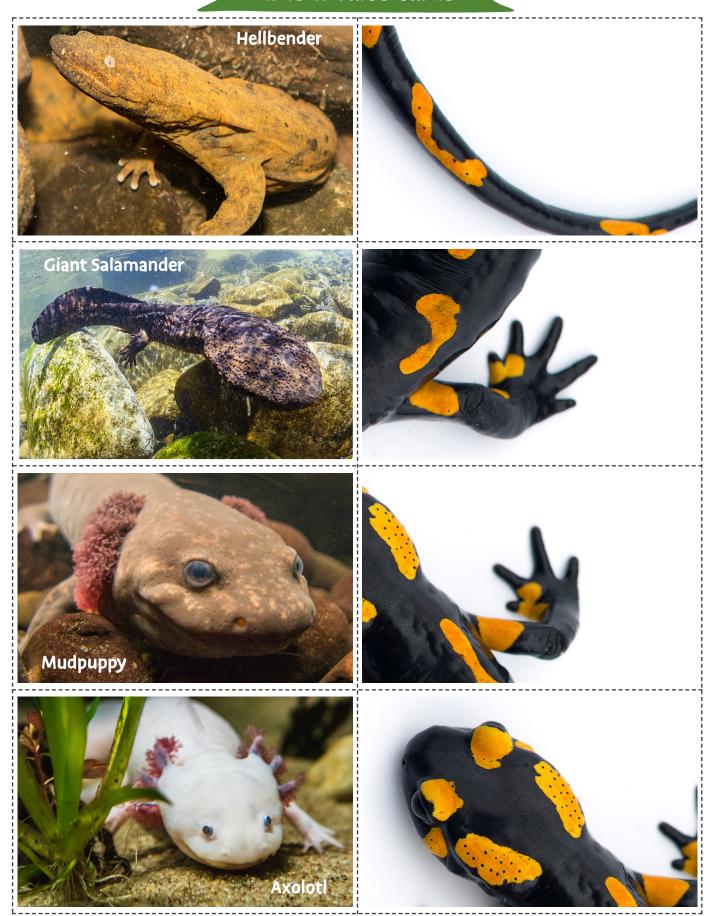
### Science Wall



Place the vocabulary card TERRESTRIAL on your science wall. Read and discuss the word and definition.



# • True or False Cards



# **True or False Cards**



All salamanders and newts are carnivores.
Earthworms, slugs, and snails are popular edibles for salamanders and newts, but some of the larger species can eat crayfish and small mammals such as mice and shrews. Salamanders that live in dark places rely on their sense of smell to detect food. At night they might wait patiently for the target to move near them, or creep up on their prey slowly.

# FALSE hellbender i

Finding an eastern hellbender in one of your local fast-flowing streams or rivers is a sign of good water quality. Reaching a length of 73 cm (29 in), this is the largest salamander species in North America. They are specially shaped to live under rocks and move upstream easily. These hidden creatures play an important role in their ecosystems. They prey heavily on arthropods and insects such as mosquitos, acting as a natural pest control.

# TRUE

Most salamanders and newts are *terrestrial* (meaning "of land"), so they spend most of their adult lives on land instead of in water, where they return only when it is time to mate. However, some species of salamanders and newts live partly or fully aquatic lives. All newts are salamanders.

# TRUE

You may have thought all these creatures were small, but there is a family of aquatic salamanders known as *giant salamanders*. The South China giant salamander can reach a length of 1.8 m (5.9 ft) and can live more than 50 years! These are the largest living amphibians known.

# **FALSE**

There are two body types found in salamanders and newts. Aquatic salamanders and newts usually have webbed feet and a paddle-like tail for swimming. On the other hand, terrestrial salamanders and newts have well-developed toes for digging in the soil and a more rounded tail.

# **FALSE**

This odd-looking creature is a mudpuppy salamander! Those frills on the sides of its head are its gills, and it lives in the mud on the bottoms of freshwater lakes, streams, and ponds. One of the few salamanders that makes noise, the mudpuppy is so named because it emits a squeak that someone once thought sounded somewhat like a puppy.

# TRUE

Newts and salamanders have various means of protection. Like frogs, the skin of some salamanders and newts is toxic and can secrete poison, so some are brightly colored to warn predators to stay away. If they are caught, they are able to allow their tails, or in some cases limbs, to break off so they can slip from the predator's grasp or bite. In time, the lost tail or limb will regrow.

# TRUE

The axolotl never goes through metamorphosis—it keeps its gills and lives its adult life in a lake in the Valley of Mexico. The northern slimy salamander spends its adult life on land but must still live in a moist environment, such as soil, leaf litter, under stones, or in rotting logs of forests in the eastern half of the United States.



Objective

Help the children learn the characteristics and variety of fish.



### **Preparation:**

Cut out the labels from the "Fish Anatomy" page in each 3-6 student journal.

# **Activity Supplies:**

- Glue stick
- 2 Tbsp ground coffee or black pepper
- Paper coffee filter

- 2 clear cups
- A rubber band
- Water

### Features of Fish

Read to the children: Close your eyes and imagine that you are fully immersed in some kind of water, such as a pool or lake. You are not allowed to use your arms or legs to move, and you have to get your oxygen from the water, not the air. Would you be able to survive?

One amazing type of animal—the fish—may be the most extravagantly designed creature of all God's creations. With fins for swimming and gills for breathing, fish can survive in water where many other animals cannot. Fish are vertebrates and ectotherms, with a stunning variety of colors, shapes, patterns, and sizes.

### Video: Fish Features

Watch the video titled "Fish Features" at goodandbeautiful.com/sciencevideos or from the Good and Beautiful Homeschooling app.

Younger children may want to have their "Fish Anatomy Activity" in front of them during the video so they can complete it as they hear the information presented.



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# Fish Anatomy Activity



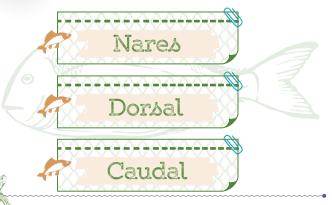
Have the children turn to the "Fish Anatomy" worksheet in Lesson 11 of their student journals. Based on the information presented in the video, have the children work together or with you to find the corresponding labels and glue them onto the correct boxes on the "Fish Anatomy"

page. Direct older children to write the words in the boxes. An answer key for this worksheet is at the end of this lesson.

#### Science Wall



Place the vocabulary cards NARES, DORSAL, and CAUDAL on your science wall. Read and discuss the words and definitions.



# Hidden in Plain Sight



# STONEFISH

Found in the coastal waters of the Indo-Pacific, the stonefish is a venomous fish whose sting is quite dangerous to humans. It is not an aggressive fish, however, and will only sting for protection.

# **EUROPEAN BULLHEAD**

The European bullhead is a type of sculpin. This small fish can be found in stony, pebbly areas of fresh or brackish lakes, rivers, and streams where the water is cold. When it heads out to hunt for prey, its coloring allows it to blend in with its surroundings.



# **LEAFY SEA DRAGON**

Found along the southern coast of Australia, the leafy sea dragon is related to both seahorses and pipefish. Its plantlike appearance makes it very easy for this fish to hide among the algae that grow in the rocky reefs where it lives.

# Saltwater Fishing Activity



Place the cut-out "Fantastical Fish" cards in front of the children. As you read the descriptions below, have the child make a match between the picture of the saltwater

fish and the label with its name, and then place the matches in front of him or her. Smaller images are provided here for parents to assist the children with matching the name to the correct fish.

Once all fish have been matched to their names correctly, ask each child to pick his or her favorite fantastical fish and set it to the side. You may need to make copies for multiple children if they select the same fish.

**Read to the children:** Saltwater fish decorate the waters of the ocean in every shade of the color spectrum. Their bizarre shapes provide endless wonder and curiosity for those who study them.

More than 75% of all saltwater fish live near the edges of the continents, in the area called the continental shelf. Let's dive in and explore some of the saltwater fish that make the ocean their home.

#### **Seahorse**

Seahorses, named for their horse-shaped heads, are found in tropical and temperate coastal



waters, typically among seaweed or other marine plant life. These cute fish are covered in tiny spinelike plates from their heads to their tails. Their tails can grasp, and they slowly propel themselves through the water by moving their dorsal fin. To move up or down in the water, they adjust the amount of air in a tiny pocket inside their bodies called a swim bladder.

### **Fangtooth**

The fierce-looking fangtooth has the largest teeth compared to its body size of any known fish in the oceans. These creepy-looking fish can be found in the depths of



the ocean where very little light can be found. Their dark-brown color works as camouflage, and their many sharp teeth are useful when hunting for food.

### **Frogfish**

Short, stocky, and covered in spines, frogfish move slowly along the ocean floor, then rapidly strike at their prey. Found in tropical and



subtropical regions of the Atlantic, Pacific, and Indian Oceans, as well as the Red Sea, they can be spotted in a wide variety of colors.

### **Whitemargin Stargazer**

These strange fish are most often found buried in the sand in coastal reefs with just their mouths and eyes showing. They have been dubbed "the meanest fish" because they not only have double-grooved poison spines, but they also have electric organs that can deliver a shock of up to 50 volts, depending on the water temperature at the time.

### Lionfish

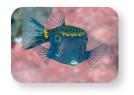
Found near coral reefs and along rocky crevices, lionfish are easy to spot due to their distinct appearance. Covered in white,



orange, brown, red, or black stripes, they are a sight to behold. With a mane-like appearance, these fish can now be found along the eastern coast of the United States, probably introduced by the home aquarium trade.

#### **Boxfish**

Boxfish, most commonly found in coral reefs around the world, are slow-moving fish that are easy to spot due to their distinctive square-like shape. Other than



their eyes, mouths, tails, and fins, boxfish are encased in a hard carapace. It is made up of fused plates and can take the shape of a triangle, square, or pentagon.