

# Reptiles vs Amphibians



**Grade:** 1, 2, 3, 4

**Length:** 30 minutes

**Big Ideas:** Organization, Categorization

**Topic:** Reptiles and Amphibians

**Summary:** Play a running game where the students will explore the differences between reptiles and amphibians.

*A Stay-at-Home Activity can be found at the end of this lesson.*

## **Strand 1.2: THE NEEDS OF LIVING THINGS AND THEIR OFFSPRING**

Living things (plants and animals, including humans) depend on their surroundings to get what they need, including food, water, shelter, and a favorable temperature. Plants and animals have external features that allow them to survive in a variety of environments. Young plants and animals are similar but not exactly like their parents. In many kinds of animals, parents and offspring engage in behaviors that help the offspring to survive.

**Standard 1.2.2** Construct an explanation by observing patterns of external features of living things that survive in different locations. Emphasize how plants and nonhuman animals, found in specific surroundings, share similar physical characteristics. Examples could include that plants living in dry areas are more likely to have thick outer coatings that hold in water, animals living in cold locations have longer and thicker fur, or most desert animals are awake at night. (LS1.A, LS1.D)

**Standard 1.2.3** Obtain, evaluate, and communicate information about the patterns of plants and nonhuman animals that are alike, but not exactly like, their parents. An example could include that most carrots are orange and shaped like a cone but may be different sizes or have differing tastes. (LS3.A, LS3.B)

## **Strand 2.2: LIVING THINGS AND THEIR HABITATS**

Living things (plants and animals, including humans) need water, air, and resources from the land to survive and live in habitats that provide these necessities. The physical characteristics of plants and animals reflect the habitat in which they live. Animals also have modified behaviors that help them survive, grow, and meet their needs. Humans sometimes mimic plant and animal adaptations to survive in their environment.

**Standard 2.2.2** Plan and carry out an investigation of the structure and function of plant and animal parts in different habitats. Emphasize how different plants and animals have different structures to survive in their habitat. Examples could include the shallow roots of a cactus in the desert or the seasonal changes in the fur coat of a wolf. (LS1.A, LS4.A, LS4.D)

**Standard 2.2.4** Design a solution to a human problem by mimicking the structure and function of plants and/or animals and how they use their external parts to help them survive, grow, and meet their needs. Define the problem by asking questions and gathering information, convey designs through sketches, drawings, or physical models, and compare and test designs. Examples could include a human wearing a jacket to mimic the fur of an animal or a webbed foot to design a better swimming fin. (LS1.A, LS1.D, ETS1.A, ETS1.B, ETS1.C)

### **Strand 3.2: EFFECTS OF TRAITS ON SURVIVAL**

Organisms (plants and animals, including humans) have unique and diverse life cycles, but they all follow a pattern of birth, growth, reproduction, and death. Different organisms vary in how they look and function because they have different inherited traits. An organism's traits are inherited from its parents and can be influenced by the environment. Variations in traits between individuals in a population may provide advantages in surviving and reproducing in particular environments. When the environment changes, some organisms have traits that allow them to survive, some move to new locations, and some do not survive. Humans can design solutions to reduce the impact of environmental changes on organisms.

**Standard 3.2.1** Develop and use models to describe changes that organisms go through during their life cycles. Emphasize that organisms have unique and diverse life cycles but follow a pattern of birth, growth, reproduction, and death. Examples of changes in life cycles could include how some plants and animals look different at different stages of life or how other plants and animals only appear to change size in their life. (LS1.B)

**Standard 3.2.2** Analyze and interpret data to identify patterns of traits that plants and animals have inherited from parents. Emphasize the similarities and differences in traits between parent organisms and offspring and variation of traits in groups of similar organisms. (LS3.A, LS3.B)

### **Strand 4.1: ORGANISMS FUNCTIONING IN THEIR ENVIRONMENT**

Through the study of organisms, inferences can be made about environments both past and present. Plants and animals have both internal and external structures that serve various functions for growth, survival, behavior, and reproduction. Animals use different sense receptors specialized for particular kinds of information to understand and respond to their environment. Some kinds of plants and animals that once lived on Earth can no longer be found. However, fossils from these organisms provide evidence about the types of organisms that lived long ago and the nature of their environments. Additionally, the presence and location of certain fossil types indicate changes that have occurred in environments over time.

**Standard 4.1.1** Construct an explanation from evidence that plants and animal have internal and external structures that function to support survival, growth, behavior, and reproduction. Emphasize how structures support an organism's survival in its environment and how internal and external structures of plants and animals vary within the same and across multiple Utah

environments. Examples of structures could include thorns on a stem to prevent predation or gills on a fish to allow it to breathe underwater. (LS1.A)

**Essential Questions:**

- How can you differentiate between two groups of animals?

**Enduring Understandings:**

- You can use the adaptations of an animal to distinguish it from a different animal.

**Objectives:**

**Students will...**

- Identify at least 1 adaptation unique to reptiles.
- Identify at least 1 adaptation unique to amphibians.

**Materials:**

- An open space to run in
- Statement list (Provided)

**Background Information:**

So what makes a reptile a reptile? The two biggest clues are: 1) they are cold-blooded, and 2) they are covered in scales. Being cold-blooded means that their bodies react to the temperature of their surroundings. When they get too warm, they can go into the water or shade to cool off. When they get too cold they can hang out in the sun to warm themselves up. Some creatures that belong to the reptile group of animals are snakes, alligators, crocodiles, tortoises, lizards, etc. Scales protect their bodies. Scales can be hard or soft, large or small. Reptiles are born on land and are born with strong instincts, so they are on their own at birth. Just think, no parents to nag them about cleaning their rooms! (Guenther, L. All About Reptiles. Kidzone, <https://www.kidzone.ws/animals/reptiles1.htm>.)

Amphibian means two-lives. Amphibians start their life with gills and tails, living in the water. Later on, they develop legs and lungs and live on land. There are more than 4,000 different species of amphibians. There are salamanders, frogs, toads, newts, and blindworms (Guenther, L. All About Amphibians. Kidzone, <http://www.kidzone.ws/animals/amphibian1.htm>.)

**Statement List:**

I have wet and slimy skin! (Amphibian)

I have dry and smooth scales! (Reptile)

When I am first born, I have gills like a fish! (Amphibian)

I lay my eggs in the water! (Amphibian)

I'm born looking just like my parents, but tiny! (Reptile)

I start my life in a larval stage! (Amphibian)

I can have lots of teeth in my mouth! (Reptile)

I have one big tooth! (Amphibians)

My eggs are hard, white shells! (Reptile)

My eggs are slimy and gooey! (Amphibian)

I breathe through my skin! (Amphibian)

I'm cold blooded! (Both)

I lay eggs! (Both)

### **Key Vocabulary:**

- Adaptation: Something that helps an animal survive in its environment/home.
- Reptile: An animal that is cold-blooded, breathes air, and is covered in scales or bony plates.
- Amphibian: An animal that is cold blooded, starts its life with gills, breathes air as an adult, and is covered in moist, slimy skin.
- Metamorphosis: The transformation an animal goes through, from the juvenile form to become an adult.

### **Procedure:**

1. Start by asking students to tell you traits they might know about reptiles and amphibians. Are they like other animals? What makes them different or the same?
2. Next draw a Venn diagram where one circle represents reptiles and the other represents amphibians.
  - a. Start with talking about the traits of reptiles. Write these in the reptile circle (don't put anything in the middle of the diagram yet. You will do this together as a class.) Emphasize that reptiles have dry, scaly skin, lay eggs, are cold blooded, and their young come out looking just like a tiny version of the adults! Another important fact is that the shells of the eggs of reptiles are hard. Reptiles have lots of teeth in their mouth, most often they are sharp for eating meat. You may need to explain cold blooded-which means these animals cannot regulate their temperature like humans. Humans and other mammals typically stay the same temperature. If we change temperature it means we are sick! Reptiles, on the other hand, are the same temperature as their environment. If they are cold they have to find a nice sunny place to heat them up. If they are hot they need a nice shady place to cool them down. As humans, we can shiver and sweat to warm up or cool down. Reptiles can't do that!
  - b. Next talk about Amphibians. Write these in the amphibian circle. They have damp skin that is often covered in mucus. Mucus is a slimy, slippery substance that covers the skin of amphibians. It protects them from germs and helps them stay moist and protected. Amphibians are very special because they spend the first part of their life living in the water! They go through what is called metamorphosis-this means they are born looking totally different from their

parents and go through a transformation as they become adults. Amphibians are born out of eggs that are small, round, and slimy. They are all laid together in a gooey mass in the water of ponds, lakes, and rivers. When they hatch, amphibians are in what's called a larval stage. It's a stage where they are much smaller than the adults and look totally different! They actually have gills so they can breathe underwater. Do you know what a frog looks like when it's hatched? A tadpole! It looks more like a fish than a frog. Amphibians also don't have lots of teeth. Some of them have NO teeth. But if they do have teeth it's usually one big flat tooth that is at the top of their mouth. It's not used for chewing or ripping food. It's used for holding onto their prey. Amphibians are also cold blooded just like the reptiles.

3. Next ask students if they see anything between the reptiles and amphibians that are the same. They should spot cold blooded. Both reptiles and amphibians are cold blooded! Put that in the middle of the diagram. They may not spot this right away but reptiles and amphibians both lay eggs, even though their eggs look very different. See if they can come up with other things that are the same. (these can be as simple as "have two eyes" or "breathe oxygen (as adults)", etc.
4. Discuss with the students how they think these traits can help reptiles and amphibians survive in their habitats? For example, scales help reptiles retain moisture. But so does mucus! Just in different ways. Ask questions like: would an amphibian be able to live in the desert very easily? Would a reptile want to lay its eggs in the water?
5. Next, play the game!
  - a. You will choose a statement from the "Statement List" above, and if the students think that statement is describing a reptile, they will run to one side of the room or field, if they think the statement is describing an amphibian, they will run to the other side. If you read a statement that is true for both they must run to the middle.
  - b. You can make it interesting by throwing in statements that you come up with on your own that are specific to a kind of reptile or amphibian. You could say "I have a long forked tongue". This would require students to have a two step process to figure out WHAT the animal is and then whether or not it's a reptile or an amphibian.
6. Metamorphosis discussion and Activity. Draw a simple Frog Life Cycle illustration on the board.
  - a. Ask students if they looked the same last year, and what they think they'll look like in 10 years. People and many other animals (Yes, you're an animal!) look similar throughout their life even as they grow. However, amphibians change the way they look as they grow. Think about butterflies. What do they look like when they're young? Insects and amphibians go through **metamorphosis**. When amphibians are young, they live their whole life in the water. Frogs for example, hatch from eggs in the water and swim around in the water as tadpoles. They don't have legs, but do have a tail and gills like a fish to live underwater. Slowly over weeks, their tail get smaller and legs begin to grow. Eventually, they leave

the water completely different; They have 4 legs, lungs, and no tail. They are adult frogs at this point and can live both in water and on land.

- b. Students will draw themselves on a piece of paper as if they began their lives in water and will go through metamorphosis. What will you wear or look like to survive in water? Students might draw fins, submarine, goggles, air tank, snorkel, wet suit, etc.
- c. Debrief by comparing student solutions to amphibian adaptations.

### **Stay-At-Home Activity**

Send the student home with the Reptile vs. Amphibian worksheet. Have them fill out the Venn Diagram as well as design an illustration of themselves going through metamorphosis. The illustration should include clear drawings of pre-metamorphosis adaptations (i.e. gills) and post-metamorphosis adaptations (i.e. lungs). Then, they can write a short explanation for how the adaptations helped them live in each stage.