

★★★ IT'S ALL ANIMALS!

ANIMALS THAT CHANGE FORMS

Nancy Furstinger



Animals That Change Forms

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Chapter 1:

Born in Water



The babies can be seen as they grow inside these frog eggs.

What kind of animals need water to lay their eggs? **Amphibians** (am•FIH•bee•unz) do! Water is important for most amphibians for their whole lives.

They need to stay close to fresh water or damp places. Water helps amphibians keep their skin moist. If they are away from water

for a long time, they will dry up and die.

This is a **trait** that nearly all amphibians share. Traits tell us how an animal looks, acts, and lives.

Amphibian females lay their eggs in water. So most amphibian babies are born in water. They start life looking like fish. They even have **gills** to breathe, like fish. The babies of nearly all frogs and toads start out like this.

These babies don't live in water forever, though. As they grow, their bodies change. Most amphibians lose their gills and grow lungs. Most of them also start to grow legs. Some, but not all, lose their tails.

These changes prepare them to move to land. In Greek, *amphibian* means "living a double life." They have one form as babies. They have another form as adults.

Who are these animals? There are three main groups of amphibians.

Frogs and toads are one group. Salamanders (SAL•uh•man•derz) are another. The third group is the **caecilians** (seh•SILL•yens). Caecilians have no legs. In fact, they look like worms. But they have some important

differences from worms. Worms do not have any bones. But every amphibian has a backbone. It also has a skull.

Amphibians live nearly everywhere on Earth. They can be found in forests and fields. They live in rain forests, streams, and swamps. But there are none in Antarctica and few in very dry deserts. They are most common in warm, damp places. Why? It's because they need water.

Cold-Blooded Creatures

These animals share another trait. They can't control their body temperature. They need to use heat from outside their own bodies.

Because of that, we call amphibians **cold-blooded**. Their body temperature changes as the air becomes cold or hot outside.

Amphibians must find a way to warm up or cool down. When the sun comes out, they lie in the sun. They soak up the heat and become warmer. The energy from the sun makes them move around more. They can also move around faster.

What happens when amphibians become

too hot? Then they need ways to cool off and stay damp. A bullfrog might jump into a pond. A toad might move into the shade, or dig into the ground.

After the sun sets, their bodies cool down. Amphibians slow down without the sun's heat. They don't move around much. They rest to save energy.

During winter, some amphibians **hibernate** (HYE•bur•nayt). This means they stay in a resting state until winter ends. First, they find a safe spot away from the cold air. Their shelter might be a dead log. It might be mud in a pond. They settle down. Their breathing and heart slow down. Their bodies use up stored energy to live through the winter.

Thin Skin

Amphibians share another trait—their skin. They have thin skin that lets water pass through it. Nearly all amphibians need to soak up water. Some sit in the water so their bodies can soak it up. Others take in moisture from the soil. Then they do not need to drink water through their mouths. Instead, they

“drink” it through their skin!

They also make mucus (MYOO•kuhs)—yes, the same stuff people have in their noses! This coats their skin and helps it stay moist.

All amphibians also go through body changes. Many start out life in eggs. But these eggs don't look like bird eggs. They have no shells, so you can see into them. Jelly coats the outside of the eggs. This jelly keeps the eggs moist. It protects them.

Mothers may lay a huge number of eggs. Most lay their eggs in the water. Some attach their eggs to plant leaves. Still others lay their eggs in damp places under logs or rocks.

After laying their eggs, the mothers leave. Each baby, or **larva**, hatches from its egg. It might already be in the water, or it might have to wiggle to get there. Then it swims through the water using its tail. Now the larva must find its own food. It also must escape from hungry animals that eat smaller animals.

The larva has gills to breathe in water. The salamander larva has gills, but they are different from those of other amphibians. Salamander gills are on the outside of the

head. These are frilly growths that stick out from the head. As water passes over the gills, they take air from the water.

As the larva gets bigger, it starts to change shape. It grows tiny hind legs. Later it grows front legs. For most amphibians, as their four legs grow longer, their tails start to shrink. Most amphibians grow lungs, and their gills disappear.

Now the larva has become a tiny adult amphibian. It's ready for another change. Now it will climb onto dry land.

The Biggest and the Smallest

Amphibians are all different sizes. The smallest one can fit on the tip of your finger. The largest grows to be as long as a bed. In between, there are more than 6,500 kinds of amphibians.

The Chinese giant salamander starts off tiny. But as an adult, it can get to be six feet long. It is the world's largest amphibian.

Like other amphibians, this salamander begins life in an egg. Its mother lays a long string of up to 500 eggs in an underwater den,

or hole. Then she leaves. It's the father who sticks around to watch over the eggs. He is known as a "den master." The father stays for about two months, until the eggs hatch.



The Chinese giant salamander starts out as a larva only an inch long.

The larva is only about an inch long. It has a lot of growing to do. The cool streams and lakes in China are flowing with food. The larva uses its senses of touch and smell to hunt other animals. It has bumps on its skin to help it feel small movements. These tell it that other animals are near.

Then the salamander grabs a meal with its

teeth. Its meal could be fish, frogs, toads, or worms. Its throat stretches as it quickly sucks the meal into its mouth.

As it grows, the larva grows legs. The fin on its tail disappears. It keeps its tail, though, unlike other amphibians. Its gills disappear, and it grows lungs.

By the time the salamander is six years old, it can be 20 inches long. This giant keeps growing, until it is nearly six feet long. Its tail makes up more than half of its body.

The Chinese giant salamander has been around for 170 million years. That means it lived with dinosaurs! It also lives a long life—up to 60 years!

Now compare the giant salamander to the smallest amphibian in the world. This tiny animal can fit on a dime! It's a tiny frog that was discovered in Papua New Guinea (GHIN•ee) in 2010. Finding it was not easy!

Scientists were recording frog calls in the rain forest. Suddenly they heard high peeps. The peeps sounded more like a bug than a frog.

But it was night, and the team couldn't

find what made the sound. So they grabbed leaves off the ground and put them in a plastic bag. They finally spotted the tiny frog, which blended into the leaves. They gave it a name that was 21 letters long. So we won't even use it here! This frog with the long name was about the size of a fly!



This frog is the smallest amphibian in the world.

But this frog is different from other frogs. It doesn't have a larva stage. Instead it hatches as a "hopper." This is a baby frog that looks like a tiny adult.

This frog might be tiny, but it has a huge

hop. It can jump 30 times the length of its body!

Weird Amphibian Facts

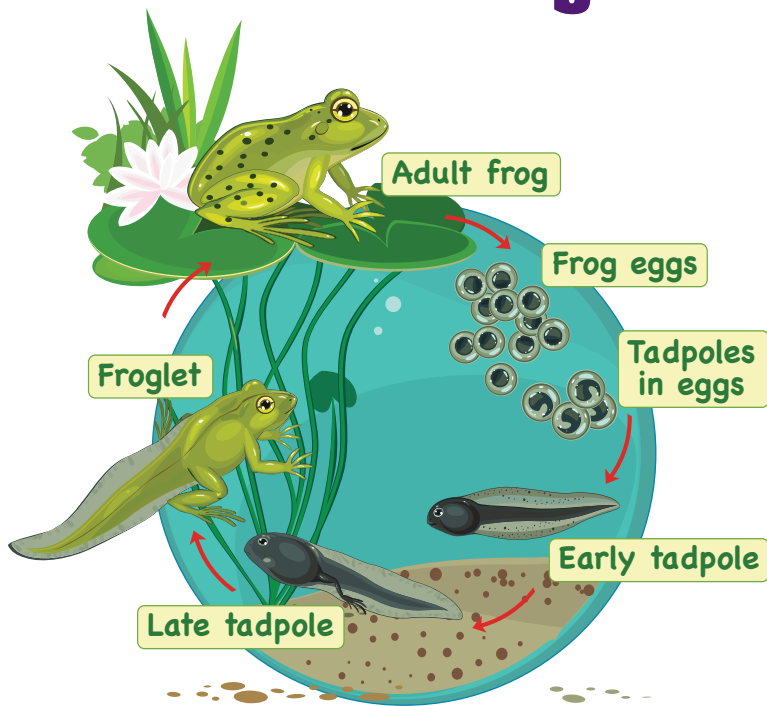
People of all ages are helping amphibians in wetlands by joining FrogWatch USA. They report on the calls of frogs and toads during mating season. This helps scientists monitor these important animals.

The water-holding frog of Australia can hibernate for up to two years! This frog sheds its skin in one piece to form a shell around its body. That helps it stay moist under the ground until the rains arrive.

Spadefoot toads need to grow super fast, before their ponds dry up. Their eggs can hatch within a day. Then they change from larva to young toad in two weeks!

Chapter 2:

Fabulous Frogs



Life Cycle of a Frog

Let's meet the first group of amphibians—the frogs and toads.

The first family is the biggest, with about 6,000 different types. Frogs and toads look like

each other. But look closely. You'll see that they have different traits.

We'll start with frogs, and talk about toads in the next chapter. Frogs are part of a huge family. There are more than 4,000 kinds!

Most frogs have moist, smooth skin. Their skin is usually green or brown. This helps frogs blend into their **habitats**. A habitat is a place where an animal lives and grows.

Frogs live in wet places. They are born in water, and they breed in water. Then they live on land as adults. Some live in swamps and grasslands. Others make their homes in rain forests. Some even live in sand dunes. They can be found everywhere except Antarctica.

Around the world, mating season gets very noisy! Male frogs croak loudly to attract females. After the male and female mate, the female lays her eggs in the water.

Frog eggs form a cluster that looks like grapes. Each female can lay from 2 to 50,000 eggs. They will hatch in as little as 2 days, or as long as 23 days.

The baby frog does not look like its parents at all. Like most amphibians, it starts as a larva.

This larva is a **tadpole**. It looks more like a fish than a frog.

The tadpole has gills to breathe in its watery home. It has a tail to swim with. The tadpole rips up pond plants to eat. It grows bigger.

As the tadpole grows, its body starts to change, both inside and outside. The young frog's front and back legs grow. Its tail starts to shrink. It grows lungs to breathe out of the water. Its gills disappear.

The frog moves differently now. It uses its long hind legs to swim. The back feet are often webbed. The feet have skin between the toes. This helps the frog swim faster. Its webbed feet will also help the frog leap a long way.

Other changes help the frog eat new foods. Its mouth and jaw change. It grows teeth in its upper jaw to bite down on **prey**. Prey are the animals it hunts and eats.

It also grows a long, sticky tongue (TUNG). Then it can shoot out its long tongue to catch prey. Its tongue will stick to flies, worms, and small fish. As soon as the meal is snapped up, the frog's eyeballs sink down into its mouth.

This forces prey down its throat.

Now the frog is an adult. It will spend most of its life hopping around on land.

Poison Frogs

Many frogs are brown or green. But some are brightly colored. Their colors flash out a warning to enemies. Watch out! Think twice before you eat me!

Many of these frogs have **neon** (NEE•ahn) colors for a reason. These are very bright red, blue, yellow, or orange. The bright colors warn other animals that they are poison. These frogs might have beautiful colors, but their skin tastes bad. If bigger animals, or **predators**, touch or eat them, the frogs' poison can even kill.

Scientists think that these frogs get their poison from the prey they eat. The small bugs they feed on, such as ants, take in plant poisons. The frogs use their sticky tongues to catch this prey. Then the poison passes from the bugs to the frogs.

The golden poison frog is one of the most deadly animals on the planet. This frog is only the size of a bottle cap. But it has enough

poison to kill ten people! Native tribes rub the tips of their blow darts on the frogs' backs before hunting.



Many frogs with bright colors have poison in their skin, like this poison dart frog.

Poison frogs live in the warm rain forests of Central and South America. There are more than 100 kinds of these frogs. Most can be found on the forest floor. There they live in fallen leaves near streams and ponds. But some frogs live high in the trees. They never even touch the ground.

Most frogs come out at night. Then they are harder for predators to spot. But poison

frogs don't need to hide from hungry hunters. They can be out during the day. They flash their bright colors. Then they can attract mates and pair up for breeding season.

Male frogs wrestle over the best egg-laying spots. The winner chooses a female. She finds a safe, dark place such as a hole in a tree trunk. Then she lays from 1 to 30 eggs. Both parents keep the eggs from drying out by keeping them moist with water and pee. They also keep the eggs safe from hungry ants.

Some frogs lay their eggs in damp places on the forest floor, but not in water. After the eggs hatch, the mother carries the tadpoles on her back. She brings the tadpoles to a small body of water. She might even lay more eggs for her tadpoles to eat.

The poison arrow frog carries her tadpoles up into trees. She brings them to wet spots in tree holes and in flowers. This frog makes a map in her mind. Then she can remember where her tadpoles are!

Glass Frogs

Suppose you had see-through skin. What

might your friends notice? They would see plenty if you were a glass frog.

When viewed from above, this frog has lime green skin. But on its belly, its skin is so thin it's **transparent**. You can see right through it. The glass frog has a transparent belly and chest.



The glass frog's underside is transparent.

If you look at it from below, you can easily see the frog's insides. You can see its liver, bones, and muscles. You can watch its heart beating. You can see food moving through its gut. Now you know what the frog ate for lunch!

Glass frogs live in the cloud forests of

Central and South America. There, mist and clouds cover the tops of the trees. Glass frogs live high up, above streams and lakes. There they blend into the leaves during the day. Some scientists think that being transparent helps the frogs blend in. They come out to hunt under the cover of darkness.

These frogs have large eyes that face forward. They have sharp vision. This helps them catch spiders and bugs.

These frogs also have a noisy mating season. The male sits on a leaf and calls out to a female. If another male gets too close, look out! A fight will break out. The frog that wins will be the top frog. He will mate with the female.

The female lays her eggs on the bottoms of leaves. She uses a special jelly to stick the eggs in place. Then she goes off on her own.

The male watches over the eggs. He sleeps next to the eggs and protects them until they hatch. Some males keep very busy. They mate with more than one female. Then they must take care of two or more groups of eggs.

Males sometimes have spots on their

backs that look like eggs. This pattern tricks predators. It keeps predators from eating the real eggs. But if predators such as wasps get too close, males will kick them away.

When the eggs hatch, the tadpoles fall into the water below the tree. Their strong tails help them swim right away.

Weird Frog Facts

Why do tiny marsh frogs take rides on top of water buffalo? The frogs eat bugs from the buffalo's coat. Then the bugs don't bother the buffalo. It's a win-win!

How fast does a frog's tongue move? Once the frog catches prey, the tongue zips back into its mouth in just 0.15 (fifteen-hundredths) of a second. That's less than an eye blink!

The male Darwin's frog swallows his tadpoles. They spend 60 days growing bigger in his throat pouch. Then the father coughs up his babies, which have become tiny adults.

Chapter 3:

Terrific Toads



The fire-bellied toad warns off predators with the neon colors on its belly.

Toads are in the same family as frogs, but they have many traits different from frogs. What do you notice when you look at a toad?

One thing you might notice is the skin. Most toads have bumpy skin. The skin is also more dry than frogs' skin. It doesn't lose moisture as easily. Unlike frogs, toads don't

KEY WORDS

amphibian	1	larvae	33
annuli	39	neon	14
axolotl	33	neoteny	31
burrow	23	olm	30
caecilian	2	predator	14
cold-blooded	3	prey	13
gills	2	regenerate	30
gland	21	tadpole	13
habitat	12	tentacle	38
hibernate	4	trait	2
invasive species ..	26	transparent	17
larva	5	vertebrate	38