



Sewee Earth Stewards – Students for Conservation

**ES Week 3-Reptiles and Amphibians
Pre Lesson 1**

Turtle Writings

Objective:

To introduce the vocabulary that will be covered in the reptile and amphibian lessons.

Procedure:

Read the poem “Turtle in July” together.

Discuss how we see just the noses of turtles sticking out of ponds and lakes in the summer. Why is this? They do it to get air to breathe, while staying cool in the water. They are **ectothermic**, so they have no way to regulate their body temperature from within.

Work on the vocabulary words (**words in bold print**) as needed.



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ES Week 3-Reptiles and Amphibians Lesson 1

Focus on Reptiles

Objective:

- Students will identify the characteristics of cold-blooded animals

Materials needed:

Slide: Turtle on a log

Live animals: Snake, Anole, and turtle (brought by Sewee Center staff)

Procedure:

- Have the slide of the turtle showing as the students come into the group lesson. Ask the students to write a descriptive paragraph about the slide.
- Leader introduction to lesson:
 - The turtle in the slide is sunning her/himself to warm up after a cool night in the swamp. The turtle is cold-blooded, so its internal temperature is dependent on the temperature of the air. When it gets too warm, it will dive into the water to cool off. We are going to take a look at some live animals today. All of them are **ectothermic** (cold-blooded) and all of them are **reptiles** that could live in l'on Swamp.
 - Other background information to share:
 - **Reptile** is from the Latin word “reptum” which means “to creep”.
 - All reptiles are **vertebrates** (have a backbone).
 - They have scaly, waterproof skin that they shed to permit growth.
 - Most reptiles lay eggs that are covered by a leathery shell and the nests are laid on land.
 - Some reptiles give birth to live young.
 - Most female reptiles lay the eggs in a nest, then leave them & let the sun **incubate** the eggs.



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- Divide the students into 3 groups. Each group will spend 15 minutes with each of the reptiles that have been set-up in a separate area.
 - **Station 1-Turtle**

This is the only reptile that doesn't have teeth. They have sharp, bony jaws for crunching into their food.

They can live on land or in water. Since they are **ectothermic**, they bask in a hot, sunny area to warm up, then go to a shady spot or into the water to cool off. No other vertebrate has anything like the turtle shell. The top part is called the **carapace**, and the bottom is the **plastron**. A bony bridge extends from the plastron and connects the two. The bridge has holes for the head and legs. The bony plates of the turtle's shell are covered by large scales. These are called **scutes** (just like on the alligator).

Some turtles, like the Eastern Box Turtle, can pull their entire bodies inside the plastron and carapace and close them tightly together.

A turtle's shell is good protection, but it is cumbersome. A turtle cannot expand its chest. It breathes by pushing its internal organs forward to squeeze against its lungs.

Turtles are hard to spot because the colors of the carapace blends in with their surroundings.

Notice the **webbed** toes that help the turtle to swim.

Turtles feed mostly on **vegetation** or slow-moving animals: snails, slugs, worms and insect **larvae**.

Females dig a hold in the dirt, lay their eggs in it, and then leave. The eggs are **incubated** by the sun.

Turtles **hibernate** during the cold months. Some dig into the mud at the bottom of a pond or lake, others dig into the ground.



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o Station 2-Anole

Things to Notice:

External Ear Openings

Eyelids that open and close (compared to the snake)

5 clawed toes

Most of its length is its tail (estimate its length, then measure it)

Body covered in tiny scales

Its color is brownish gray, green or dull yellow

The **dewlap** is a loose flap of skin that hangs from the neck of males only.

Information:

To signal another male that he owns a territory, a male anole fans his **dewlap**. It turns a reddish orange color. If two males want the same territory, they face one another, open their mouths, fan their dewlaps, and bob their heads. They may dart at each other or twist and turn from side to side. If one backs down, he turns dull yellow and leaves, the “winner” turns a bright green.

Anoles have special pigment cells beneath their **epidermis** (outer layer of skin). These cells give their skin its color. When an anole is frightened, excited or sick, the **pigment** flows upward, and the epidermis changes color.

Temperature, sunlight and shade can also make the skin color change.

Anoles are **carnivorous**. They can zap prey with their tongues or grab it with their open mouths. If the prey is small, they swallow it whole. Otherwise, they can chew it up. They eat insects, insect larvae, worms, and spiders.

Speed and **camouflage** coloring help protect anoles from their **predators**. In addition, an anole’s tail can break off if a predator grabs it. The bones in the tail come apart, the muscles separate, and the skin tears. This doesn’t harm the anole and there is little or no bleeding. The tail piece squirms around, and the anole can escape. A new tail grows, but it never gets as long as the original one.

Anoles are **diurnal** (active during the day) so at night they sleep under cover.

Anoles **hibernate** during the cold winter months.

Additional resource: [Catch Me If You Can](#), D. M. Souza, Carolrhoda Books, Inc., 1992.



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Station 3-Snakes

Things to Notice:

No eyelids; instead they have a bit of clear hard skin over each eye
No external ear openings (Snakes do not hear. They do not have ears.)

Snakes feel vibrations in the ground through the underside of their bodies.

Feel the snake – it feels dry and smooth.

When a snake flicks its tongue, it is checking the air for smells

The tongue touches holes in the roof of its mouth where there are lots of nerves that detect scent: **Jacobson's organs**.

Compare the scales on the top side (**dorsal**) of the body with those on the bottom side (**ventral**).

How does a snake move?

Information:

Most snakes lay eggs, but some mothers give birth to live young. The babies look exactly like the parents, except they are smaller. Baby snakes can take care of themselves as soon as they are born.

As snakes grow, they periodically “shed their skin”. (The thin outside layer is what comes off.) Snakes start shedding at the head. They rub their heads against something rough to help break the skin around the chin. Then they crawl very slowly. The skin comes off inside out. Usually a snake stops eating before it sheds. Its skin looks duller. The eyes look like they have a milky film over the. After shedding the snake's colors are **vibrant** again and it is ready to eat.

Snakes are **ectothermic** (cold-blooded) and during cold weather they **hibernate**. They go into caves, under piles of rocks, or deep holes in the ground to hibernate. Usually snakes need to warm up every morning before they can move around. They do this by lying in the sun or on a warm rock or on the warm ground.

Snakes are **carnivorous**. They can eat prey that is bigger than the thickness of their own body. They can do this because snakes can open their mouths very wide. Each side of the lower jaw can move separately, and the lower jaw can be unhitched from the upper part of the snake's skull. Snakes swallow their food whole.

Some snakes catch their **prey** by sitting and waiting for it. They use **camouflage** to hide until something comes near. Snakes like grass snakes or garter snakes swim through the water to catch fish and frogs. Snakes that eat slow movers like worms, slugs or snails follow a scent trail until they catch up with their prey. Small animals are usually swallowed alive. Big animals like lizards, mammals, birds have to be killed before they are swallowed. Some snakes kill by **constriction**. They squeeze the prey until it can't breathe. Other snakes are **venomous**. They use poison to kill their prey.



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Different snakes eat different kinds of food. Some of their foods are: fish, chicken, mice, rats, squirrels, rabbits, chipmunks, insects, worms, birds, frogs, toads lizards, salamanders, other snakes.

Predators of snakes are hawks, skunks, raccoons, hogs, alligators and other animals (including humans).

Snakes usually protect themselves by running away and hiding. Sometimes they stay perfectly still so the enemy won't notice. If it has to, the snakes will fight the only way it can – by biting. A bite from a poisonous snake can make a person sick or kill him.

We live in an area where there are poisonous snakes. Don't go looking for snakes unless you are with someone who knows what he or she is doing. Don't stick your hand under a log or into a pile of stones without looking first.

Other resources;

Snakes, by Ruth Belov Gross, Four Winds Press, New York
The Snake in the Grass, by Mike Linley, Oxford Scientific Films
A Gathering of Garter Snakes, by Bianca Lavies, Dutton Children's
Books



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ES Week 3-Reptiles and Amphibians Lesson 2

Water Life, Metamorphosis, and Amphibians

Objective:

- To explore the plants and animals that live in/on the water in the swamp.
- Students will study metamorphosis and the animals that have this life cycle.

Materials:

- Duckweed
- magnifying glasses
- drawing pencils
- small plastic trays to put samples in
- Crayfish
- Frog eggs, tadpoles and/or frogs
- Student Information page (1 per student)
- Water Life Puzzle (1 per student)
- Water Life Study page (1 per student)
- Golden Guides Pond Life books (at least 10)

Procedure:

Begin class with a slide of duckweed. Students will write a short poem about duckweed.

Leader Introduction:

Today we are going to study some of the tiny things that live in l'on Swamp. If we dip a net into the water there, we could come up with some **duckweed** – the plant in this slide. It gets its name from the fact that ducks just love to eat it. In fact, its nickname is “duckmeat”.

And we would bring up different kinds of insects, spiders or crustaceans, maybe some crayfish or water beetles.

We might net some frog eggs or maybe some tadpoles. Frogs are animals that go through a **metamorphosis** in their life cycle. That word means “**transformation**” or a big change. When baby frogs hatch out of their eggs, they don't look like adult frogs. There are other animals that go through metamorphoses and we will look at some of them today.

Divide students into 4 groups to visit each of the 4 stations for 12 minutes.

Station 1 – Duckweed

Have students take a small amount of duckweed and place it on the small plastic trays.

Where is the root? Where is the **frond** (what looks like a leaf, but truly isn't one)? Does the plant have a stem? (no) Is the underside the same color as the top? Draw a labeled diagram of a frond with its roots.

Now, listen to this information about duckweed then use some of it to write a short descriptive paragraph or poem about duckweed.



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Duckweed floats on the surface of quiet waters. Many plants together often look like a green carpet. Duckweed does not have true leaves or stems. The tiny roots come from the frond. The duckweed flower is so tiny it is hard to spot it. The duckweed fruit is inflated like a very, very small balloon. Animals that live on the water's surface have special adaptations that allow them to walk on the surface without breaking through. Some of these eat duckweed. Waterfowl especially enjoy duckweed. For this reason, its nickname is "duck meat".



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Station 2 – Crayfish

The purpose of this station is to give students information about crayfish and eliciting observations from them. Students should draw the crayfish as a scientific drawing, labeling the abdomen, thorax, and head.

The crayfish body is covered with a hard shell.

It is a **crustacean** and is related to crabs, lobster, and shrimp.

Crayfish have 5 pairs of legs. The front pair is its pincers.

There are 2 pairs of feelers in front of the mouth.

The body is divided into 3 main parts: head, **thorax, and abdomen**.

The crayfish lives at the bottom of the pond.

It is not able to float and is a poor swimmer.

It propels itself to the surface to feed; then sinks back to the bottom.

Crayfish are primarily **nocturnal**, active at night.

Crayfish are **omnivorous**. They eat small plants and animals and dead plant and animal material.

The crayfish has a tail shaped like a fan. When the animal feels threatened, the tail snaps closed onto the abdomen. This causes the crayfish to shoot through the water backward. It's jet-propelled!! The movement raises a curtain of silt between the crayfish and its predator. Predators have to be quick to catch a crayfish.

Crayfish are hunted by blackbirds, night herons, fish, otters, raccoons, snakes, turtles, and frogs. A crayfish fisherman in Louisiana said "Sometimes when you pick up a bullfrog, he'll crunch, he's so full of crayfish."

If a predator gets hold of a crayfish leg, the crustacean has a muscular reflex that snaps off the leg at its narrowest point. The small break clots quickly, and in time a leg grows back. If a crayfish is wounded anywhere else, it can bleed to death quickly.



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Station 3 – Eggs, tadpoles and frogs

Frogs are **amphibians**, just like toads and salamanders. Amphibian comes from the Greek word that means “two lives”. Most amphibians start their lives in water and then move to land after their bodies change or after they go through **metamorphosis** (from the Greek word for “transformation”).

Amphibians:

- Are **vertebrates** (have backbones)
- Are **ectothermic** (cold blooded) so that their body temperature changes according to the outside temperature. Ectotherms are more active when the weather is warm.
- Have naked skin – no scales, fur or feathers.
- Have skin that is permeable to gases and water
- Can dry out, but than can also breathe through their skin when they are **dormant**.
- Are **dormant** in cold weather when they hibernate
- Are **dormant** in hot weather and drought when they **estivate**

Frog eggs hatch into tadpoles. Tadpoles are not completely developed. They use their mouths to cling to some support in the water at first. They have long tails and look like a little fish.

Tadpoles breathe through their gills which are hidden under a cover of skin.

As tadpoles grow, their form changes. The tail becomes larger and makes it possible for the tadpole to swim around and to get food. They eat plants and decaying animal material.

After a period of time (different for each species), tadpoles begin to grow legs. The hind legs appear first. After the lungs start to develop, the front legs appear. Then the digestive system changes to allow frogs to eat live animals. Finally the tadpole loses its gills. It is a frog now, but it still has a tail. The frog now comes out of the water to live. Eventually the tail is absorbed and the frog is in its complete adult stage.

Ask students to study the information on the student worksheet, then have them draw a frog metamorphosis from memory.



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Station 4 – Water Life

Talk with students about other animals that go through metamorphosis (butterflies, mosquitos, mayflies, dragonflies). Use the Water Life Study page 1 & 2 as a guide. Then get students to do the Water Life Puzzle.

Have Pond Life guide books as a resource.



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Reptile/Amphibian Vocabulary

Reptile	a cold blooded vertebrate with lungs and scales or horny plates; most lay eggs
Vertebrates	animals that have a backbone
Carapace	hard bony covering like the plates on the back of a turtle
Plastron	the bottom shell of a turtle
Webbed	membrane joining the digits of various water animals
Vegetation	plant life in general
Larvae	early form of an animal after it hatches that is very different from its parents
Hibernate	to spend the winter in a resting state
Dewlap	loose flap of skin that hangs from the neck of male anoles
Epidermis	outer layer of skin
Pigment	cells that give skin its color
Diurnal	active during the day
Jacobson's organs	nerves that are found in the roof of a snakes mouth that detect smells
Dorsal	top side of body
Ventral	bottom side of body
Vibrant	lively; bright
Prey	an animal that is hunted and killed by another animal for food
Constriction	to kill prey by squeezing
Venomous	full of venom; poisonous; to kill prey by injecting poison
Metamorphosis	a change in the form of an animal during its development



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Transformation	a change in the form or appearance of
Duckweed	a plant that floats on the surface of water; does not have true leaves or stems; a favorite food of waterfowl
Fron	the leaves of a fern or palm
Crustacean	a class of arthropods that includes shrimp, crabs and lobsters; have a hard outer shell
Thorax	part of the body between the neck and abdomen; the middle segment
Abdomen	part of the body between the diaphragm and pelvis; the belly
Nocturnal	active at night
Omnivorous	an animal that eats both plants and animals and dead plant and animal material
Amphibian	“two lives”; animal that starts life in the water and then moves to land
Dormant	inactive
Estivate	to pass the summer in an inactive state

Curriculum Standards

**ES Week 3
Amphibians and Reptiles**

Reading/English Language Arts

I. Reading/Literature

- The student will read and learn the meanings of unfamiliar words and phrases.
 - Use knowledge of root words, prefixes, and suffixes.
 - Expand vocabulary through listening, reading, and writing words which reflect both general knowledge and specific subject-related vocabulary.

II. Listening

- The student will listen, draw conclusions, and share responses in subject-related group learning activities.
 - Participate in and contribute to discussions across content areas.
 - Summarize information gathered in group activities.



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- Follow multi-step oral directions.

III. Writing

- The student will write for a variety of purposes to describe, to inform, to entertain, and to explain.
 - Choose planning strategies for various writing purposes.
 - Organize information.
 - Use vocabulary effectively.
 - Revise writing for clarity.

Science

IV. Inquiry

- **Process Skills**
 - Observe
 - Use the senses and simple tools to gather information about objects or events such as size, shape, color, texture, sound, position, and change (qualitative observations)
 - Classify
 - Compare, sort and group concrete objects according to two attributes.
 - Infer
 - Explain or interpret an observation based on data and prior knowledge.
 - Discriminate between observations and inferences.

V. Life Sciences

- **Populations and Ecosystems**
 - Populations of organisms can be categorized by the function they serve in an ecosystem. Plants and some microorganisms are producers – they make their own food. All animals, including humans, are consumers, which obtain food by eating other organisms. Decomposers, primarily bacteria and fungi, are consumers that use waste materials and dead organisms for food.
 - Distinguish among the roles organisms serve in a food web (producers, decomposers, consumers, prey and predators).
 - Describe an organism by its niche in an ecosystem.