Bodies and Behaviors

Students will learn how Reptile and Amphibians behavioral and physical adaptations help them survive and reproduce.

This activity satisfies one of the required JNMN lessons needed to complete the Junior Zoology Master Badge.

ZOOLOGY MASTER

Appropriate Ages 8-12

Expected Time: 55 min

Learning Objectives:

Students will learn Internal structures, bones, not only support the body, but also allow specific movements relative to reptile, amphibians, or turtles.

Students will learn (lesser known) behavioral adaptations, including winter survival.

Students will learn that an individual's behavioral and physical adaptations both play a role in successful reproduction.

NE Science Standards:
Grades 4-6

SC.6.9.3
SC.3.7.2
SC.4.13.4
SC.6.13.4

Did You Know...
Turtles can breathe through their butt while hibernating underwater!

When multiple snakes are found together in the Spring, that this is a normal event, a temporary winter survival strategy?

JUNIOR NEBRASKA MASTER NATURALIST

BEFORE YOU TEACH

BACKGROUND KNOWLEDGE

Reptiles and Amphibians sometimes are overlooked when compared to soft furry mammal babies, but the tactics they use to survive are fascinating. Many animals in this category are prey for larger animals, but also occasionally find themselves at the top of a singular food chain, their existence within a food web is crucial for the overall functioning of an ecosystem.

MATERIALS AND PREP:

Engage: 10 Min

Review Nebraska reptiles, amphibians, and turtles by asking for examples. What are some differences between reptiles, turtles, and amphibians. Clues might be...

- time of day they're active,
- outer coverings on bodies,
- speed that they move,
- habitat,
- the place they lay eggs, etc.

List similarities on an erase board. Clues might be...

- how they catch their prey, (ambush)
- their babies hatch,
- internal structure of the back,
- body temperature,
- action to warm their bodies and
- what they do in the winter.

Explore: 25 Min

Softshell aquatic turtles bury into mud for an ambush, snakes smell that the prey have used a path, and sit and wait along that path. Frogs sit and wait underneath the water where just their eyes are above water. Another behavioral adaptation is that some species of snakes can climb trees

VOCABULARY

Reproduce: To produce new individuals of the same kind

Adaptation: A change in an organism or its parts that fits it better for the conditions of its environment

Aquatic: living in or often found in water

Ectotherm: An animal that relies primarily on its external environment to regulate the temperature of its body

Brumate: When reptiles stop eating and become inactive. It's different from hibernation in that during brumaiton, the reptiles are not technically in a sleeping state but rather have a slowed down metabolism that requires them to eat less.

Hibernaculum: A burrow, crevice a shelter occupied during the winter by an animal that is almost hibernating.

Vertebrate: Having a spinal column

Metamorphosis: A process of change in the form and habits of some animals during transformation from an immature stage (as a tadpole) to an adult stage (Frog)

Explore Continued:
Another behavioral adaptation is that some species of snakes can climb trees

Display skeletons and turtle shells. Point out…
1. the neck vertebrate in the turtle, and
2. the ribs attached to the backbone in the snake,
3. the broad feet and long legs for jumping in the frog skeleton.
4. Hand out snakeskins to every student, what adaptation does what you're holding represent?

Next, show the tools that may open the walnut. Try both the walnut cracker tool and the pliers on the walnut, then make the connection that a snake's jaws are like the pliers. Can we open our jaws like that? It would be impossible, to put something in your mouth the size of a watermelon.

Explain: 15 Min
Have students break into 6 groups, number them and hand out the frog namecards, Using the flash-drive, play frog call #1, pause for their vocalization. Similarly, each group listens, memorizes and vocalizes their frog's call. Play the chorus of 2-3 frog calls together, distinguish? Have students decide as a group if their frog was featured in the audio recording. Repeat with other chorus recordings. Give each person in the winning group a mini plastic frog.

Extend: 5 Min
Walk by students with the embossed jars and plastic pieces of the frog's life cycle. Ask which of the plastic metamorphosis pieces goes first in the life cycle of the frogs? List the different phases on the whiteboard and seek student's life experiences with seeing the different phases. Then quiz students of what's the average number of eggs laid by North American frogs? Answer is 1000-6000? Land and Aquatic Turtles? 4-50, and the final question how many eggs laid by small snakes versus large snakes? 12, 100. Why do reptiles and amphibians lay so many eggs? Introduce term brumate, what does this behavior seem like to you? Where do reptiles brumate? Snakes in groups so they can stay warm? Introduce term Hibernaculum and inform students that once Spring arrives, the snakes disperse into separate territories. Frogs? Aquatic turtles bury themselves in the mud of their habitat, and land turtles burrow down into the ground.

Evaluate: 5 Min

Is a frog's call a physical or behavioral adaptation? What behaviors are necessary to find other animals of its own kind when reproducing? Which of the five senses are used by frogs to find another frog? What sense for reptiles and turtles? Smell. To reproduce and lay eggs they must find one another – if not enough frogs, may be unable to reproduce, same with turtles and reptiles who often travel to find their mates.

How can scientists check to see whether species are reproducing enough to keep their populations numbers up, radio transmitter chips under the snakes' skins, and citizens report sightings to help the scientists. Introduce Dennis card help track numbers of, rep, turtle and identify your frog by recording a video on your phone, then comparing with this website. Share website, select identify from menu, choose a species, and scroll down to its call recording. Notice the Report tab and share the data collection page.

Hands On Extension

In the Lab: *Classroom Experiment*

snake craft with snake movement worksheet

In the Field:
Hibernaculum build, with diagram
or Herp Walk

In the Community:
Invite UNL's herpetology expert to speak virtually or in person about conservation of snakes and frogs in Nebraska.

*COMPLETING ANY ACTIVITY FROM THIS SECTION WILL COUNT AS YOUR SECOND ACTIVITY REQUIREMENT FOR THE ZOOLOGY MASTER BADGE.

RESEARCH AND RESOURCES

For information on the biodiverstiy of Nebraska's mammals, visit
http://outdoornebraska.gov/watchablewildlifereptilesamphibians/

For information on identifying Nebraska's reptiles and amphibians, visit https://herpneb.unl.edu/

Hands On Nature, Introducing Reptiles, Hickman, Pamela, 1993
Hands-On Herpetology, Schneider, Krasny, Morreale, 2001

Are Frogs Nocturnal? - AZ Animals (a-z-animals.com)
Are Turtles Nocturnal or Diurnal? (Beginner's Guide) – Reptiles Time
How Many Eggs Do Frogs Lay? (toadsnfrogs.com)
The Secrets of Wintering Wildlife: Turtles, Frogs and Snakes (delaware.gov)
https://a-z-animals.com/blog/everything-youve-ever-wanted-to-know-about-snake-eggs/
Frog Skin: Everything to Know (toadsnfrogs.com)
How do Snakes Mate? (With Pictures) - ReptileHow.com
Softshell Turtle - Description, Habitat, Image, Diet, and Interesting Facts (animals.net)
Life Cycle of a Frog: Stages of Frog Development Explained (reptile.guide)
Snake Predation Strategies – Part 1: Bodies and behaviours (unimelb.edu.au)
Similarities & Difference Between Amphibians and Reptiles (bioexplorer.net)