Okmulgee- Deep Fork National Wildlife Refuge - Elementary
Title: Animals Have Structures That Serve Different Functions
Video Title on SDE Website: Animals Have Structures E
Length: 0:07:53

Teacher Tool – Primary Focus: 3rd Grade
Description of the Bellringer:
Cheryl Cheadle, of the Oklahoma Conservation Commission's Blue Thumb program, assists 5th grade and middle school students of Okmulgee Public Schools as they catch and observe fish, crustaceans amphibians and macroinvertebrates. Ms. Cheadle discusses some of the features/structures of these animals (gills, lungs, exoskeleton and a tadpole's tail) and the functions of these features.

Curriculum Application

***PASS* for Life Science**

Grade 3 Standard 2.2 Each plant or animal has different structures that serve different functions in growth and survival.

Background Information: Definitions

Predator	An animal that kills and eats another animal. A dragonfly is a predatory insect.
Odonata	A category of insects that consists of dragonfly and damselfly species. This Latin word refers to the tooth-shaped jaws which dragonflies and damselflies use to capture and kill their prey.
Gills	An organ that enables an animal to obtain dissolved oxygen from water and that places the oxygen in the organism's blood.
Lungs	An organ that enables an animal to obtain oxygen from the air and that places it in the organism's blood.
Exoskeleton	A hard, protective, covering for such invertebrate animal's as crustaceans, crayfish, lobster and many insects (i.e. dragonflies). Having no backbone, an exoskeleton provides support for the invertebrate animal's body. Because the exoskeleton is rigid, as these animals grow they must shed their old exoskeleton and grow a new, and slightly larger, exoskeleton.
Chitin	Pronounced *Kite-'n*, this is the substance that makes the outer layer of a crustacean's exoskeleton so hard.
Molt	A term that is used in this bellringer to describe the process by which a crayfish shed's it's exoskeleton prior to growing a new, slightly larger, exoskeleton.
Amphibian	Animals such as frogs, toads and salamanders which live their lives in two habitats: water and land (amphi is a Greek word that means "double-life"). They begin life in an aquatic habitat, gills to breathe dissolved oxygen. During their metamorphosis into an adult, they develop lungs to breathe oxygen from the atmosphere. They have a thin, permeable, skin, which makes them vulnerable to environmental pollutants in the air, soil and water.

Okmulgee – Deep Fork National Wildlife Refuge - Elementary
Title: Environmental Changes Can Affect an Organism's Survival
Video Title on SDE Website: Environmental Changes Affect E
Length: 0:08:21

Teacher Tool – Primary Focus: 5th Grade

Description of the Bellringer:
Ms. Cheryl Cheadle, of the Oklahoma Conservation Commission's Blue Thumb program, shows 5th grade and middle school students of Okmulgee Public Schools how the presence, or absence, of certain aquatic animals can tell us about the quality of a particular body of water. Ms. Cheadle notes that some aquatic organisms are sensitive to pollution, meaning that they can't survive in water that is polluted and/or that has low levels of dissolved oxygen. On the other hand, other aquatic organisms are tolerant of poor water quality conditions. Mr. Darrin Unruh, manager of the Deep Fork National Wildlife Refuge, tells the students that as certain animal species become fewer in number, it indicates that something in the environment is not right. Some animal species are in decline because of loss of habitat. Another factor is that pollution in the environment may be harming certain animal populations.

Curriculum Application

***PASS* for Life Science**

Grade 5 Standard 2.2 Changes in environmental conditions due to human interactions or natural phenomena can affect the survival of individual organisms and/or entire species.

Additional Resources
For more information about the use of benthic macroinvertebrates as an indicator of water quality:

Oklahoma Conservation Commission's **Blue Thumb** program.
http://www.ok.gov/conservation/Agency_Divisions/Water_Quality_Division/Blue_Thumb/

Oklahoma Conservation Commission's **WOW! The Wonders of Wetlands** program.
http://www.ok.gov/conservation/Agency_Divisions/Conservation_Programs_Division/Conservation_Education/WOW_Wonder_of_Wetlands.html

Project WILD, "Environmental Barometer", okprojectwild@fullnet.net

Biological Indicators of Watershed Health: www.epa.gov/bioiweb1/html/benthosclean.html

Macroinvertebrate Monitoring: www.chicagoriver.org/upload/MacroinvertebrateMonitoring.pdf

For information about rare and endangered wildlife populations:

U.S. Fish and Wildlife Service – Endangered Species Program http://www.fws.gov/endangered

Audubon Society – Conservation Programs http://conservation.audubon.org

National Wildlife Federation http://www.nwf.org/wildlife.aspx

The Cornell University Lab of Ornithology http://www.birds.cornell.edu

Okmulgee – Deep Fork Natl. Wildlife Refuge - Elementary
Title: Introduction to a Bottomland Hardwood Wetland Within the Deep Fork NWR
Video Title on SDE Website: Intro to a Bottomland E
Length: 0:04:16

Teacher Tool – Primary Focus: 4th and 5th Grades

Description of the Bellringer:
Ms. Cheryl Cheadle, of the Oklahoma Conservation Commission's Blue Thumb Water Pollution Education Program, describes what a wetland is and why this type of habitat is so important, not only for wildlife, but also for people. The participants in this bellringer are 5th grade and middle school students of Okmulgee Public Schools.

Curriculum Application

***PASS* for Life Science**

Grade 4 Standard 3.1 Organisms can survive only in environments in which their needs are met.

Grade 5 Standard 2.1 Organisms in a community depend upon each other for food, shelter and reproduction.

Background Information:
Wetlands are defined as those areas that are covered by water or that have waterlogged soils. Wetlands include such places as swamps, marshes and bogs. Wetlands may also be places that are wet during some times of the year, but dry at other times. All wetlands have vegetation that is adapted to growing on saturated soils. Oklahoma has the following types of wetlands:
• playa wetlands (Panhandle counties)
• riparian corridors along rivers and streams
• forested wetlands, including bottomland hardwood forests
• marshes and bogs
• oxbow lakes
• cypress swamps (only in southeastern Oklahoma, near Idabel)
Prior to pioneer settlement, about 200 million acres of present-day Oklahoma were wetlands. During the past 200 years many of these wetland areas have been drained or filled so that they can be used for farming, road construction and urban development. Currently wetlands cover about 950,000 acres of Oklahoma. Wetlands have many benefits. They provide excellent habitat for many plant and animal species. A number of endangered species depend upon wetland habitats for their survival. Wetlands benefit people by serving as a storage place for flood waters. Wetlands help to recharge ground water resources, called aquifers. Wetlands are sometimes called the kidneys of the Earth for they act as Nature's filter, removing sediments, excess nutrients and toxic materials from the water which flows through them.

Additional Resources
Oklahoma Conservation Commission's **Project WET, WOW! (The Wonders of Wetlands) & Blue Thumb** programs.
http://www.ok.gov/conservation/Agency_Divisions/Conservation_Programs_Division/Conservation_Education/Project_WET.html
http://www.ok.gov/conservation/Agency_Divisions/Water_Quality_Division/Blue_Thumb/

Project WILD Aquatic okprojectwild@fullnet.net

Project Learning Tree www.forestry.ok.gov/project-learning-tree

Okmulgee- Deep Fork National Wildlife Refuge - Elementary
Title: Organisms in a Community Depend Upon Each Other for Survival
Video Title on SDE Website: Organisms in Community E
Length: 0:08:40

Teacher Tool – Primary Focus: 5th Grade

Description of the Bellringer:
Students observe animals as they obtain food that is present in their habitat. In turn, it is noted that animals help plants to survive, with such examples as woodpeckers removing insects from a tree and the role of hummingbirds and butterflies and other pollinators.

This bellringer also discusses the role of beaver as a "keystone species." As beaver cause a wetland to be formed, this wetland in turn serves as habitat for many other animal, as well as plant, species. In this way the beaver is a "key", for without it these other species are not able to survive in a particular place.

Mr. Darrin Unruh, the manager of the Deep Fork Wildlife Refuge, describes the different layers of a forest: the understory, mid-story, and canopy. Each layer provides a habitat for different species of birds. Even large trees that are dead, called snags, are important to wildlife. Woodpeckers make cavities for their nests in these dead trees. Other animals, such as squirrels, also use these cavities as places to raise their young.

Curriculum Application

***PASS* for Life Science**

Grade 5 Standard 2.1 Organisms in an ecosystem depend on each other for food, shelter and reproduction. Ecosystems include food chains and food webs.

Additional Resources
Oklahoma Conservation Commission's **WOW! The Wonders of Wetlands,** page 31 – 40, "Wetlands as Home"; and page 38, "Beavers- Wetland Movers and Shakers"
http://www.ok.gov/conservation/Agency_Divisions/Conservation_Programs_Division/Conservation_Education/WOW_Wonder_of_Wetlands.html

Project Learning Tree, provides a number of activities that focus on habitat and ecosystems, ex. "Trees as Habitats", www.forestry.ok.gov/project-learning-tree

Project WILD, provides a number of activities that focus on a) habitat, ex."What's That, Habitat?"; b) food chain, ex. "Energy Pipeline", www.projectwild@fullnet.net

Okmulgee – Deep Fork National Wildlife Refuge – Elementary
Title: Science Processes and Inquiry
Video Title on SDE Website: Science Processes E
Length: 0:09:10

Teacher Tool – Primary Focus: Process Standards for Elementary Grades

Description of the Bellringer:
Students learn how to use a seine and dip net to catch fish and other aquatic animals for study. Ms. Cheryl Cheadle, of the Oklahoma Conservation Commission's Blue Thumb Water Pollution Education Program, also assists 5th grade and middle school students of Okmulgee Public Schools, as they use a bug box, which is a magnification tool, to observe macroinvertebrate animals. Ms. Cheadle points out that it is helpful to use such things as a dichotomous key to correctly identify species that are similar in appearance. She also reminds us to be careful to not injure the creatures that are being studied. For example, a person should always wet their hands before handling a fish. In this way a fish's protective coating, called ich (or ick) isn't removed. At the conclusion of this field study, the animals are safely returned to their wetland habitat. We are always respectful of the organisms that we study.

Curriculum Application

***PASS* for Life Science Process Standards**

Standard 2.1 Classify a set of organisms using observable properties and a dichotomous key.

Standard 3.3 Use tools to gather data.

Additional Resources
Attached is an example of a dichotomous key for classifying some species of benthic macroinvertebrates and other aquatic animals.

A website that contains photo images of macroinvertebrates is:
www.bgsd.k12.wa.us/hml/jr_cam/macros/amc/index.html

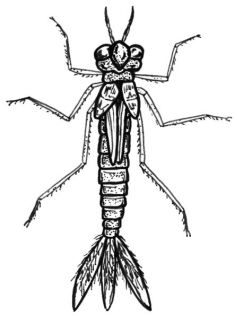
Dichotomous Key

Thorax (body part that is behind the head) has easily observable segmented legs;
(the insect has 3 pairs of legs) and no shell.
Possibilities: larva of mayfly, damselfly, dragonfly, dobsonfly, caddisfly, cranefly, or whirligig beetle

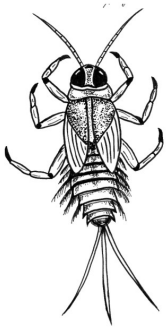
Abdomen (body part that is behind the thorax)

1. **has 3 tail-like structures** (mayfly or damselfly larva) **OR** 2. **has 1,2 or no tail-like structures** (dragonfly, dobsonfly, caddisfly, cranefly or whirligig beetle larva)

1.A **has feathery tails** (gills) and round eyes **OR** 1.B **has hair-like tails** and **gills** on the **sides of its abdomen**



Damselfly larva

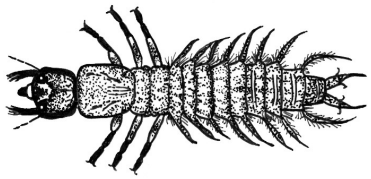


Mayfly larva

2.A **has a large head OR** 2.B **doesn't have** a large head

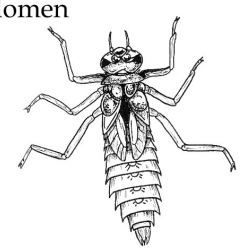
2.A **has** a large head **OR**

2.A.i **has** 8 pairs of spurs along the sides of its abdomen



Dobsonfly larva

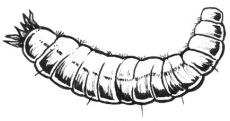
2.A.ii **doesn't have** spurs along its abdomen



Dragonfly larva

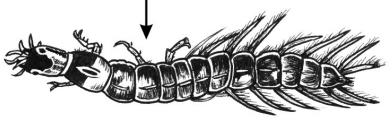
2.B **doesn't** have a large head

2.B.i head is **small,** but viewable **OR** 2.B.ii head **isn't easily viewable** (retracted into the thorax)



Cranefly larva

2.B.i.a has **feathery projections** along its abdomen



Whirligig beetle larva

2.B.i.b **doesn't have** projections along its abdomen

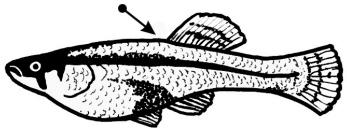
Caddisfly larva

Aquatic Animals that don't have easily observable segmented legs. None of them have a shell.

1. **Swims** in the water. **OR** 2. **Doesn't swim** in the water.

1.A **Whips tail** to move **OR** 1.B **Doesn't whip** tail to move

1.A.i **Has fins** **OR** 1.A.ii **Doesn't have** fins

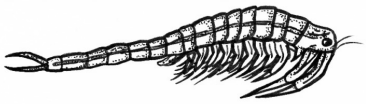


Mosquito fish

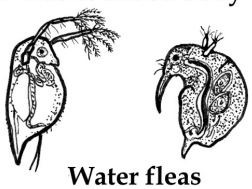
Tadpole

1.B **Swims, has tiny, feathery legs**

1.B.i **Has slender body** 1.B.ii **Has rounded body**



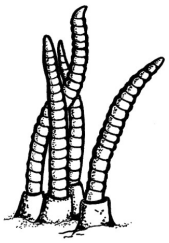
Fairy shrimp



Water fleas

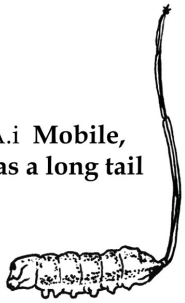
2. **Doesn't swim, shaped like a worm**

2.A **Mobile** **OR** 2.B **isn't mobile**



Tubifex worms

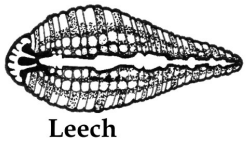
2.A.i **Mobile, has a long tail** **OR** 2.A.ii **Mobile, no tail or short tail**



Rat-tail maggot

Mobile, no tail or short tail

2.A.ii.a **Flattened body** **OR** 2.A.ii.b **Cylindrical shaped body**



Leech

Cylindrical body

2.A.ii.b* **No** breathing tube, tiny legs **OR** 2.A.ii.b** **Has** a breathing tube at end of body

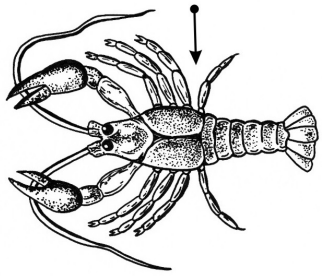
Midgefly larva

Mosquito larva

Animals That Have Shells or Carapace

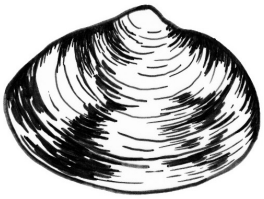
1. **Shell covers entire body**

2. **Shell doesn't cover entire body**



Crayfish

1.A Shell is **oval-shaped**



Fingernail clam

1.B Shell is **peanut-shaped.**

Lung snail

Okmulgee – Deep Fork National Wildlife Refuge - Elementary
Title: Wetlands are Important Ecosystems
Video Title on SDE Website: Wetlands Are Important E
Length: 0:09:41

Teacher Tool – Primary Focus: 5th Grade

Description of the Bellringer:
Mr. Darrin Unruh, manager of the Deep Fork National Wildlife Refuge, Ms. Cheryl Cheadle, of the Blue Thumb Water Pollution Education Program, and Mr. Roger Wyrick, manager of Okmulgee State Park, explain why wetlands are such important ecosystems. Many wetlands have been lost due to changes in land use. In this bellringer these individuals point out that wetlands are not only important for wildlife but also provide many benefits to people. The students are reminded that national wildlife refuges are the property of all citizens of this country. The future of national wildlife refuges depends upon present and future generations making sure that such special places remain. This bellringer highlights both the wetland of the Deep Fork National Wildlife Refuge as well as the boardwalk and wetland of nearby Okmulgee State Park. Both locations welcome schools to use these facilities for field trips and science exploration.

Curriculum Application

***PASS* for Life Science**

Grade 5 Standard 2.2 Changes in environmental conditions due to human interactions or natural phenomena can affect the survival of individual organisms and/or entire species.

Additional Resources
History and Mission of the U.S. Fish and Wildlife Service www.fws.gov/refuges/

Oklahoma Conservation Commission's **Blue Thumb and WOW! The Wonders of Wetlands** programs. Pages 120 – 122,"Treatment Plants"
http://www.ok.gov/conservation/Agency_Divisions/Conservation_Programs_Division/Conservation_Education/WOW_Wonder_of_Wetlands.html

The following is a partial listing of opportunities for aquatic outdoor education that are available in Oklahoma. These locations all have trained staff who are eager to serve school's who seek an aquatic field trip.

Oklahoma State Parks www.oklahomaparks.com

U.S. Dept. of Interior: Deep Fork NWR, (918) 756-0815; Salt Plains NWR, (580) 626-4794; Wichita Mountains NWR, (580) 429-3221; Chickasaw Natl. Rec. Area (580) 231-4422

Rogers County Conservation District Education Reserve, thereserve@rogerscountyconservationdistrict.org

Quartz Mountain Nature Park, sue@quartzmountain.org, (580) 563-2666

Okla. Dept. of Wildlife Conservation: Arcadia (405) 396-2223; Hackberry Flat (405) 990-4977