

Okmulgee – Deep Fork National Wildlife Refuge – Middle School

Title: Diversity and Adaptations of Organisms: Classification by Internal and External Structures

Video Title on SDE Website: Diversity and Adaptations MS

Length: 0:05:48

Teacher Tool – Primary Focus: 8th Grade

Description of the Bellringer:

Ms. Cheryl Cheadle of the Conservation Commission’s Blue Thumb Program leads middle school and fifth grade students of Okmulgee Public Schools as they conduct a life hunt of aquatic animals that live in the Deep Fork National Wildlife Refuge. Crayfish, tadpoles, fish and dragonfly larva serve as the subjects for discussion about the differences between vertebrate and invertebrate animals, as well as between those animals that have gills versus those that have lungs.

Curriculum Application

PASS for Life Science

Grade 8 Standard 3.2 Organisms have a great variety of internal and external structures that enable them to survive in a specific habitat.

Additional Resources

Oklahoma Conservation Commission’s **WOW! The Wonders of Wetlands**, page 35 – 36, “Wetland Animals”, and pages 94 – 97, “Wetland Wierdos”

Okmulgee – Deep Fork National Wildlife Refuge – Middle School

Title: Interdependence of Organisms

Video Title on SDE Website: Interdependence of Organisms MS

Length: 0:06:55

Teacher Tool – Primary Focus: 6th Grade

Description of the Bellringer:

Ms. Cheryl Cheadle, of the Oklahoma Conservation Commission’s Blue Thumb program, helps middle school and 5th grade students of Okmulgee Public Schools as they explore a wetland within the Deep Fork National Wildlife Refuge. Among the species that are shown in this bellringer are: a green sunfish, which Ms. Cheadle describes as an aggressive predator; a mosquito fish, which feeds on mosquito larva; a dragonfly which is another excellent predator; and a tadpole which is a source of food for fish. Ms. Cheadle also shows the students a just-hatched baby fish. Such baby fish are called “young of the year”. Because baby fish are more sensitive to water pollution than older fish, the presence of “young of the year” is a good indicator that the water within this wetland is of good quality. The bellringer also points out that aquatic plants, along with sunlight and decaying plant material (detritus) are the basis of the wetland’s food chain. These aquatic plants provide oxygen, as well as food and shelter, for many of the animals that live in this wetland habitat.

Curriculum Application

PASS for Life Science

Grade 6 Standard 4.1 Organisms within an ecosystem are dependent on one another and on nonliving components of the environment. Some source of energy is needed for all organisms to stay alive and grow. Energy transfer can be followed in food chains and webs.

Additional Resources

Oklahoma Conservation Commission’s **WOW! The Wonders of Wetlands**, pages 31 – 40 “Wetlands as Home”; also pages 109 – 111 “Marsh Market”

Oklahoma Conservation Commission’s **Blue Thumb Program**

http://www.ok.gov/conservation/Agency_Divisions/Water_Quality_Division/Blue_Thumb/
Biological Monitoring of Oklahoma’s water bodies

Project Learning Tree provides activities that focus on energy transfer and food chains/webs, ex. “Web of Life”, www.forestry.ok.gov/project-learning-tree

Project WILD Aquatic okprojectwild@fullnet.net

Okmulgee Deep Fork National Wildlife Refuge – Middle School

Title: Living Organisms Have Physical and Behavioral Responses to External Stimuli

Video Title on SDE Website: Living Organisms Physical MS

Length: 0:05:45

Teacher Tool – Primary Focus: 7th Grade

Description of the Bellringer:

This bellringer provides examples of how certain plants and animals that live in the Deep Fork National Wildlife Refuge respond to changing environmental conditions. Ms. Cheryl Cheadle, of the Blue Thumb Water Monitoring Program, uses a fresh water clam and an orange spotted sunfish to discuss this topic with middle school and fifth grade students of Okmulgee Public Schools. The bellringer concludes this discussion using several other examples of animal and plant responses to seasonal changes in their environments.

Curriculum Application

***PASS* for Life Science**

Grade 7 Standard 4.2 Living organisms have physical and/or behavioral responses to external stimuli.

Additional Resources

Oklahoma Conservation Commission’s **WOW! Wonders of Wetlands**, page 38, “Responses to Environmental Changes”; **Blue Thumb Water Monitoring Program**

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

Project WILD Aquatic, “Environmental Barometer”, okprojectwild@fullnet.net

Okmulgee – Deep Fork National Wildlife Refuge – Middle School

Title: Organisms with Similar Needs May Compete with One Another for Resources

Video Title on SDE Website: Organisms with Similar Needs MS

Length: 0:06:15

Teacher Tool- Primary Focus: 6th Grade

Description of Bellringer:

Mr. Darrin Unruh, manager of the Deep Fork National Wildlife Refuge, talks to middle school and fifth grade students of Okmulgee Public Schools about competition between organisms that have similar needs. Two examples from this refuge's upland forest habitat are: the competition for sunlight between trees; and, competition between native plants and invasive plant species. The non-native Japanese honeysuckle is crowding out some native plant species within the Deep Fork National Wildlife Refuge.

This bellringer also notes that some species seek those habitats that have few competing species. For example, some shorebirds improve their chances for survival by migrating to Arctic regions to nest and raise their young. Shorebirds have few competing species in these tundra habitats.

Curriculum Application

PASS for Life Science

Grade 6 Standard 4.2 In all environments, organisms with similar needs may compete with one another for resources.

Additional Resources

Oklahoma Conservation Commission's **WOW! Wonders of Wetlands**: Wetland Interactions, pages 38 -39.

Project Learning Tree: "Invasive Species" <http://www.forestry.ok.gov/project-learning-tree>

For information about shorebirds:

www.whsrn.org/western-hemisphere-shorebird-reserve-network

Okmulgee – Deep Fork National Wildlife Refuge – Middle School

Title: Science Process and Inquiry

Video Title on SDE Website: Science Processes MS

Length: 0:10:06

Teacher Tool – Primary Focus: Process Standards

Description of Bellringer:

Ms. Cheryl Cheadle, of the Oklahoma Conservation Commission's Blue Thumb program, assists middle school and fifth grade students from Okmulgee Public Schools as they learn how to use a seine and dip nets to catch fish and benthic macroinvertebrates that live in a wetland within the Deep Fork National Wildlife Refuge. The students also learn to use magnification tools to observe the macroinvertebrates and discuss how a dichotomous key helps in classifying the organisms that they find.

Curriculum Application

***PASS* for Science Process Standards**

Standard 1.2 Use appropriate tools;

Standard 2.1 Use observable properties and a dichotomous key to classify an organism.

Additional Resources

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

Images of Benthic Macroinvertebrates: 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, crane fly, or whirligig beetle

Abdomen (body part that is behind the thorax)

1. has 3 tail-like structures
(mayfly or damselfly larva) OR

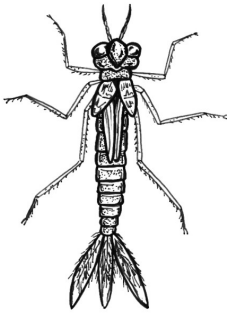
2. has 1,2 or no tail-like structures
(dragonfly, dobsonfly, caddisfly,
crane fly or whirligig beetle larva)

1.A has feathery tails
(gills) and
round eyes

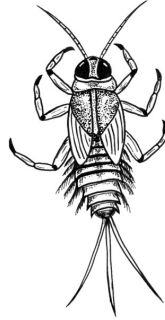
1.B has hair-like
tails and gills on the
sides of its abdomen

2.A has a large head OR

2.B doesn't have a large
head



Damselfly larva

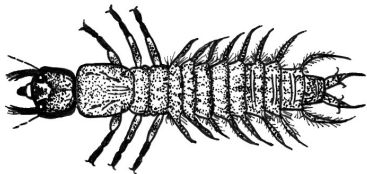


Mayfly larva

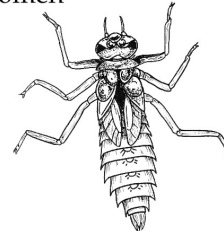
2.A.i has 8 pairs of
spurs along the sides
of its abdomen

2.A has a large head
OR

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



Dobsonfly larva



Dragonfly larva

2.B doesn't have a large head

2.B.i head is small, but viewable

OR

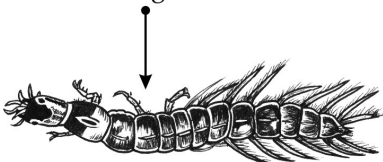
2.B.ii head isn't easily viewable
(retracted into the thorax)



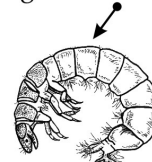
Crane fly larva

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

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

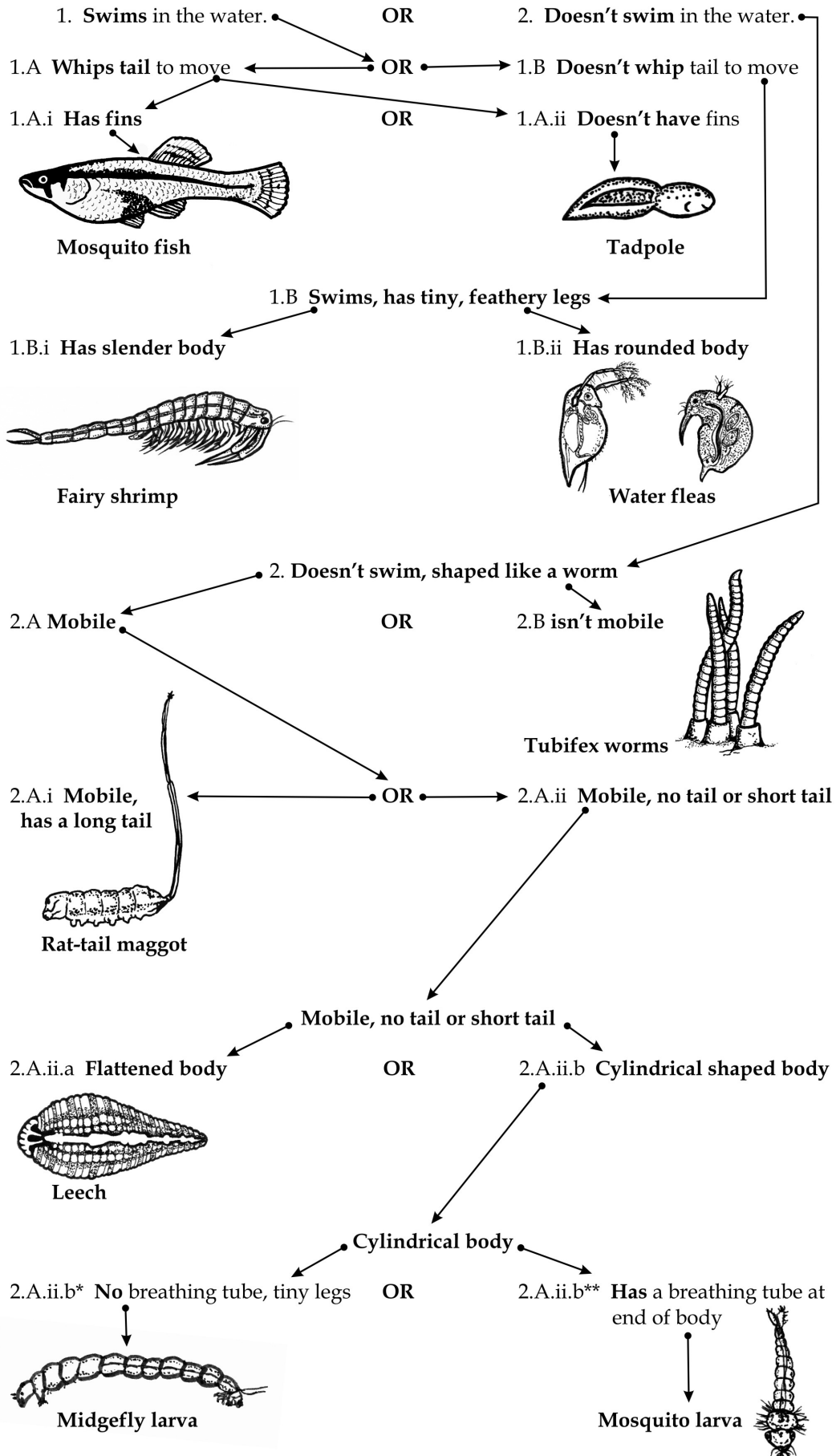


Whirligig beetle larva



Caddisfly larva

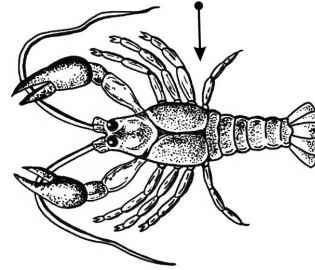
**Aquatic Animals that don't have easily observable segmented legs.
None of them have a shell.**



Animals That Have Shells or Carapace

1. Shell covers entire body

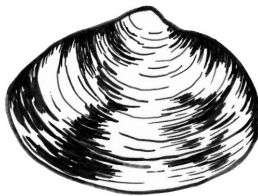
2. Shell doesn't cover entire body



Crayfish

1.A Shell is oval-shaped

1.B Shell is peanut-shaped.



Fingernail clam



Lung snail

Okmulgee – Deep Fork National Wildlife Refuge – Middle School

Title: Specialized Structures Perform Specific Functions

Video Title on SDE Website: Specialized Structures MS

Length: 0:08:44

Teacher Tool – Primary Focus: 7th Grade

Description of the Bellringer:

Ms. Cheryl Cheadle, of the Oklahoma Conservation Commission’s Blue Thumb Water Monitoring Program, shows middle school and fifth grade students of Okmulgee Public Schools some of the specialized structures of aquatic animals. Some of the features of crayfish, dragonfly larva, tadpoles and water boatman are examined with discussion of the functions of these structures. Mr. Darrin Unruh, manager of the Deep Fork National Wildlife Refuge, points out that trees serve as an excellent example of specialized structures for their roots take in oxygen and nutrients, while their leaves provide food to the tree through the process of photosynthesis.

Curriculum Application

PASS for Life Science

Grade 7 Standard 2.2 Specialized structures perform specific functions at all levels of complexity.

Additional Resources

Images of Benthic Macroinvertebrates: www.bgsd.k12.wa.us/hml/jr_cam/macros/amc/index.html

Project Learning Tree: “Tree Factory”, Chapter 63; www.plt.org

WOW! The Wonders of Wetlands, page 35, “Wetland Animals”

Okmulgee – Deep Fork National Wildlife Refuge – Middle School

Title: Water Quality Measurements

Video Title on SDE Website: Water Quality Measurements MS

Length: 0:06:41

Teacher Tool – Primary Focus: Process Standards

Description of the Bellringer:

Ms. Cheryl Cheadle, of the Oklahoma Conservation Commission assists middle school and fifth grade students of Okmulgee Public Schools as they conduct several Blue Thumb water quality tests. Ms. Cheadle explains how the sampling of aquatic organisms and turbidity measures are two of the ways that the health of a wetland can be determined. The students learn how to use a secchi disk in measuring water turbidity. Ms. Cheadle and Ms. Rhnea Stoy of the Okmulgee County Conservation District, explain how Blue Thumb volunteers are so important in helping to monitor Oklahoma's water quality. They invite teachers and students to become involved in this program.

Curriculum Application

***PASS* for Science Process Standards**

- Standard 1.2 Use appropriate tools;
- Standard 2.1 Use observable properties to classify;
- Standard 3.5 Conduct experiments;
- Standard 4.1 Report data

Additional Resources

Oklahoma Conservation Commission's Blue Thumb Monitoring Program,

http://www.ok.gov/conservation/Agency_Divisions/Water_Quality_Division/Blue_Thumb/

Water Quality Index Protocol: www.pathfinderscience.net/stream/cproto4.cfm

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