

# VIRGINIA ANIMALS & THEIR HABITATS

## Topic 4 What is a Life Cycle?

### TABLE OF CONTENTS

<b>TOPIC 4 – WHAT IS A LIFE CYCLE?</b> .....	<b>111</b>
<b>Topic 4: Overall Information</b> .....	<b>111</b>
<u>Overview</u> .....	<u>111</u>
<u>Topic 4 Virginia SOL</u> .....	<u>111</u>
<u>Teacher Background Knowledge</u> .....	<u>111</u>
<u>Student Learning Expectations</u> .....	<u>112</u>
<u>Procedure</u> .....	<u>112</u>
<b>Session 4.1 – Introduction to Animal Life Cycles</b> .....	<b>113</b>
<b>Session 4.2 – Butterflies and Moths</b> .....	<b>115</b>
<u>Butterflies and Moths</u> .....	<u>117</u>
<u>Butterfly Wing Template – Student Sheet</u> .....	<u>132</u>
<b>Session 4.3 – Frogs</b> .....	<b>133</b>
<u>Bullfrog Information</u> .....	<u>136</u>
<u>Little Grass Frog Information</u> .....	<u>137</u>
<u>Mountain Chorus Frog Information</u> .....	<u>138</u>
<u>Northern Green Frog Information</u> .....	<u>139</u>
<u>Pickerel Frog Information</u> .....	<u>140</u>
<u>A Sampling of Virginia Frog Length Data – Student Sheet</u> .....	<u>141</u>
<u>A Sampling of Virginia Frog Length Data - Teacher Key</u> .....	<u>142</u>
<u>Female Frog Length Recording – Student Sheet</u> .....	<u>143</u>
<u>Male Frog Length Recording – Student Sheet</u> .....	<u>145</u>
<b>Session 4.4 – Life Cycle Models</b> .....	<b>147</b>
<b>Session 4.5 – Project Work Time: Life Cycles</b> .....	<b>149</b>
<u>Life Cycle Planning Page – Student Sheet</u> .....	<u>150</u>
<b>Acknowledgments</b> .....	<b>i</b>
<b>Special Thank You for Permission to Use Items in Virginia Animals and their Habitats</b> .....	<b>iii</b>

## TOPIC 4 – What is a Life Cycle?

### Topic 4: Overall Information

#### Overview

In this group of lessons students will define what a life cycle is and compare different types of life cycles. They will utilize measurement skills and data analysis, and create visual representations of various life cycles throughout the sessions.

Topic 4 Virginia SOL			
Science	English	Mathematics	History & Social Science
2.1 a, b, c, d, e, h, i, j, k, l 2.4 a 2.7 a	2.1 c, d, e 2.2 a, b, c, e 2.3 a, b, c, d, e 2.7 d, e 2.9 a, b, c, d, e, f, g 2.10 b, d 2.12 2.14	2.11 a 2.15	

#### Teacher Background Knowledge

- A life cycle is a defined sequence of changes from birth to maturity to death of a living organism. During an animal’s life cycle it goes through a series of orderly and identifiable changes.
- The word metamorphosis means “change of form.”
- The butterfly goes through a metamorphosis. The stages of the butterfly life cycle are egg, larva (caterpillar), pupa (casing is called a chrysalis), and adult butterfly. When a butterfly emerges from the chrysalis, its wings are wet and need to dry before it can fly.
- At rest, butterflies hold their wings vertically over the back.
- Butterflies are usually brightly colored or strikingly patterned, have club-tipped antennae, and are active during the day.
- Moths also go through a metamorphosis. The stages of the moth life cycle are egg, larva (caterpillar), pupa (called a cocoon), and the adult moth.
- At rest, moths fold their wings tentlike over their body, wrap them around their body, or hold them extended at their sides.
- Moths have stouter bodies than butterflies, their coloring is duller, and they have distinctive feathery or thick antennae.
- The stages of a frog life cycle are egg, tadpole, froglet, and frog. Some sources may mention a polliwog stage between tadpole and froglet.
- Some animals like frogs and butterflies go through a complete metamorphosis as they mature to adults. The baby and adult look nothing alike; whereas, other animals like bears and turtles resemble their parents from birth to maturity and do not have distinct stages.
- Grasshoppers undergo a simple metamorphosis. They resemble their parents but do not have all

---

the body parts of an adult such as wings.

- A symmetrical object is an identical mirror image.
- Measurement of a unit is the distance between each unit. A millimeter is a smaller unit of a centimeter and even smaller unit of a meter.
- See Topic 3, the Habitat topic - for more teacher background information on measurement.
- A picture walk is when the teacher previews the text and illustrations in a book with the students, identifying the key components to set the purpose for reading.

### **Student Learning Expectations**

- Describe the stages in the life cycle of a frog (egg, tadpole, froglet, frog), a butterfly (egg, larva, pupa, butterfly), and a moth (egg, larva, pupa, moth).
- Compare and contrast life cycles using a Venn diagram.
- Identify animals that go through a complete metamorphosis and those that do not go through distinct stages.
- Identify examples of symmetry in nature.
- Collect and analyze data.
- Measure length using the millimeter.

### **Procedure**

**NOTE: The procedures in the topic sessions may be divided into several different lesson periods. Each session may take more than one lesson period to complete.**

## Topic 4: Session 4.1 – Introduction to Animal Life Cycles

### Session Supplies:

- Teacher-selected book on animal life cycles
- Teacher-selected book about the butterfly life cycle

### Session Virginia SOL

Science	English	Mathematics	History & Social Science
2.1 a, b, c, d, k 2.4 a	2.2 a, b, c, e 2.3 a, b, c, d 2.9 a, b, c, d, e, f, g		

Excellent resources about reptiles and amphibians can be found on the New Hampshire Fish and Game Department (NHFGD) Web site at <http://www.wildnh.com/Kids/kids.htm>, *Turtles and Snakes* Vol. 4, Issue 1 and *Frogs, Toads, and Salamanders*, Vol. 4, Issue 2. *Wild Times for Kids* is published twice a year by the NHFGD. The magazine can be downloaded.

## Session 4.1 – Introduction to Animal Life Cycles

Teacher Questions & Notes	Procedures
	<p>PROJECT WORK TIME:</p> <p>Give project teams time to work. During their project work time, meet with each team to monitor their progress and clarify directions.</p>
	<ol style="list-style-type: none"> <li>1. Explain to students that they will learn specifically about the life cycles of individual species that can be found within Virginia. In the students' journals have them answer the question, "What is a life cycle?" Have students share responses to determine their prior knowledge.</li> <li>2. Before reading a book on animal life cycles, take a picture walk of the book, making sure to identify key nonfiction text features such as the title, table of contents, headings, bolded vocabulary, glossary, and index.</li> </ol>
<p>-After reading the book, ask the students again, "What is a life cycle?"</p> <p>-Do people go through life cycles?</p>	<ol style="list-style-type: none"> <li>3. Read the book on animal life cycles.</li> </ol>
	<ol style="list-style-type: none"> <li>4. Develop a class statement such as "A life cycle is a series of stages that an animal goes through as it grows and matures."</li> <li>5. As a group, create a T-table listing "Young animals that look like their parents" and "Young animals that don't look like their parents." Use examples of animals from all six classification groups (mammals, insects, reptiles, amphibians, birds, and fish). Students may want to refer back to the list of animals they made</li> </ol>

## Session 4.1 – Introduction to Animal Life Cycles

Teacher Questions & Notes	Procedures
	<p>at the beginning of the unit. Discuss the results and clarify any misconceptions.</p> <p>6. Instruct students to choose one animal from the chart and draw or write about that animal's life cycle in their journal.</p> <p>7. Have students share with a partner their journal entry.</p>
-Is there anything you want to add to our shared statement?	8. Revise the class statement about life cycles.
	<p>9. During this unit, the student will learn about three specific life cycles (frogs, butterflies, and moths). Use the picture walk strategy before reading a nonfiction book about the butterfly life cycle. Tell the students to listen for the stages in the butterfly's life cycle as you read.</p> <p>10. After reading, have students share with a partner the stages of the butterfly life cycle. Refer back to the shared statement and revise it based on students' suggestions. (This statement will be used again in future sessions.)</p>

Read the background information in the Project WILD Aquatic activities "Are You Me?" (pg.2) and "Turtle Hurdles" (pg. 158) for additional life cycle information.

## Topic 4: Session 4.2 – Butterflies and Moths

### Session Supplies:

- Shared statement about animal life cycles written in Topic 4, Session 4.1
- *Butterfly and Moth* sheets (pg. 117-131)
- Pattern blocks or small 1 x 1 centimeter squares of colored paper
- *Butterfly Wing Template* sheet (pg. 132)

### Session Virginia SOL

Science	English	Mathematics	History & Social Science
2.1 a, b, c, d, i, j, k 2.4 a 2.7 a		2.15	

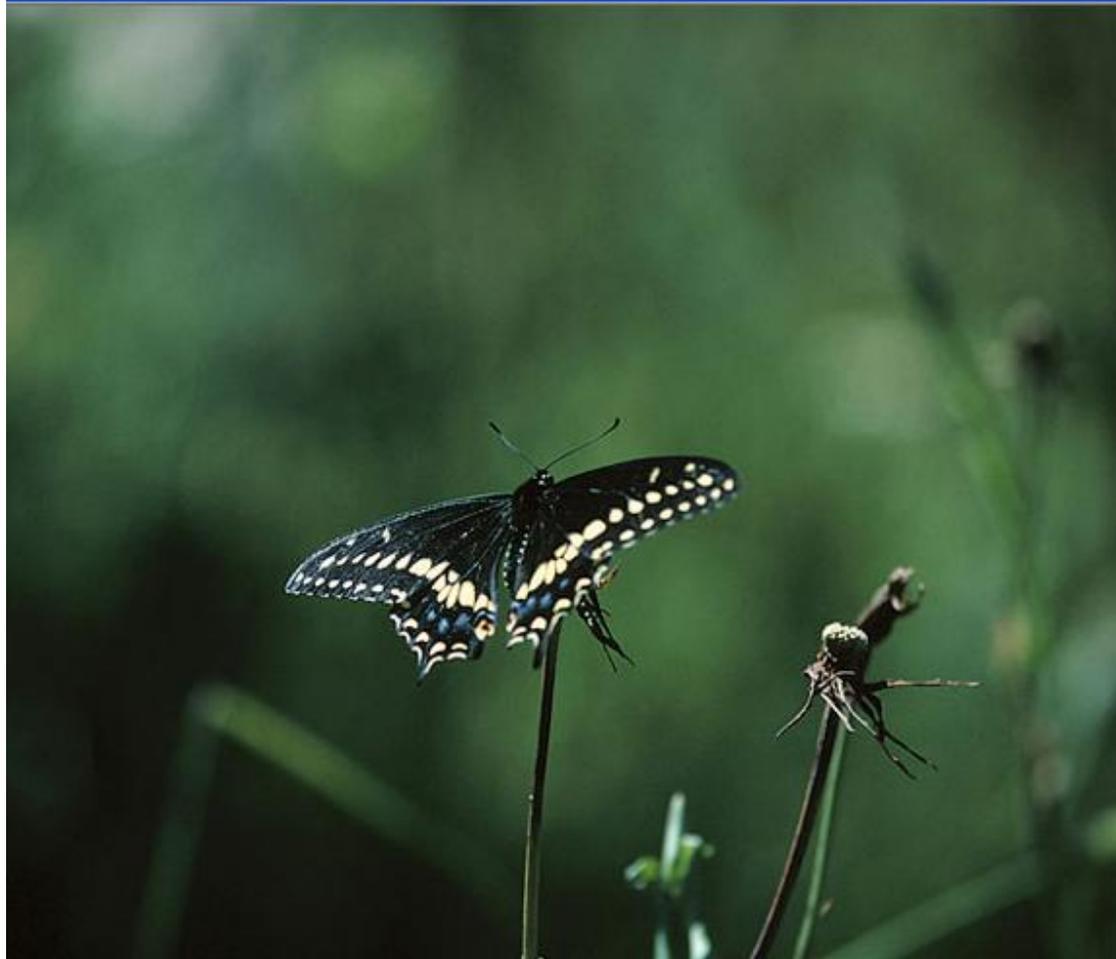
## Session 4.2 – Butterflies and Moths

Teacher Questions & Notes	Procedures
<p>-Do you think all butterflies have the same life cycle?</p> <p>-What are the stages of a moth’s life cycle? (egg, larva-<i>caterpillar</i>, pupa-<i>cocoon</i>, moth)</p> <p>-How are the stages of the butterfly’s life cycle and the stages of the moth’s life cycle alike? Different? (pupa for a butterfly is a chrysalis, pupa for a moth is a cocoon)</p>	<ol style="list-style-type: none"> <li>1. Begin the lesson by reviewing the shared statement and stages in a butterfly life cycle discussed in Topic 4, Session 4.1.</li> <li>2. Discuss the life cycle of a moth.</li> <li>3. Compare how the life cycle of a butterfly and a moth are the same and how they are different.</li> </ol>
	<ol style="list-style-type: none"> <li>4. Show the pictures of a variety of different butterflies and moths found on the <i>Butterfly and Moth</i> sheets. <p style="text-align: center;"><i>For other pictures, you can use the computer to project photographs up on the screen. “Google Images” is a great resource. If technology is not readily accessible, you can also use photographs from nonfiction books.</i></p> </li> </ol>
	<ol style="list-style-type: none"> <li>5. Guide students to understand that different species of butterflies go through the same life-cycle stages and the different species of moths go through the same life-cycle stages.</li> </ol>
	<ol style="list-style-type: none"> <li>6. As a class, review the photographs. Discuss similarities and differences between the different butterflies and moths. (<i>Refer to the “Teacher Background Knowledge” section of the “Topic 4 Overview” (pg. 111-112)</i>)</li> <li>7. Compare the differences between butterflies and moths.</li> </ol>
<p>-What is symmetry?</p> <p>-Why do you think we see symmetry in nature?</p>	<ol style="list-style-type: none"> <li>8. Allow students to brainstorm ideas, but guide them toward the symmetrical characteristics of the butterfly and moth wings.</li> </ol>

## Session 4.2 – Butterflies and Moths

Teacher Questions & Notes	Procedures
<p>-Where else in nature do you see symmetry? -How do you think it helps animals to survive?</p>	<ol style="list-style-type: none"><li>9. Choose one distinct photograph to use. Have students observe one wing and compare it to the other wing. Lead the students to define symmetry.</li><li>10. Discuss as a class where else in nature students have seen symmetry.</li><li>11. Tell students that they will be creating one side of a butterfly wing using pattern blocks. Pass out the pattern blocks and the <i>Butterfly Wing Template</i> sheet (pg. 132) and have students create their design.</li><li>12. When students are done, have them switch seats with a partner. They will recreate the other wing on the partner's design. Have students check each others' work.</li><li>13. Have them glue the butterfly wing template page directly in their journals. <i>If the students used the pattern blocks to build the symmetrical wings, have them draw the symmetrical wings on their butterflies before they cut out and paste them in their journals. If they used the colored 1 x 1 centimeter squares, have them glue the squares on their butterflies before they cut out and paste them in their journals.</i></li></ol>

## Butterflies and Moths



**Black Swallowtail**

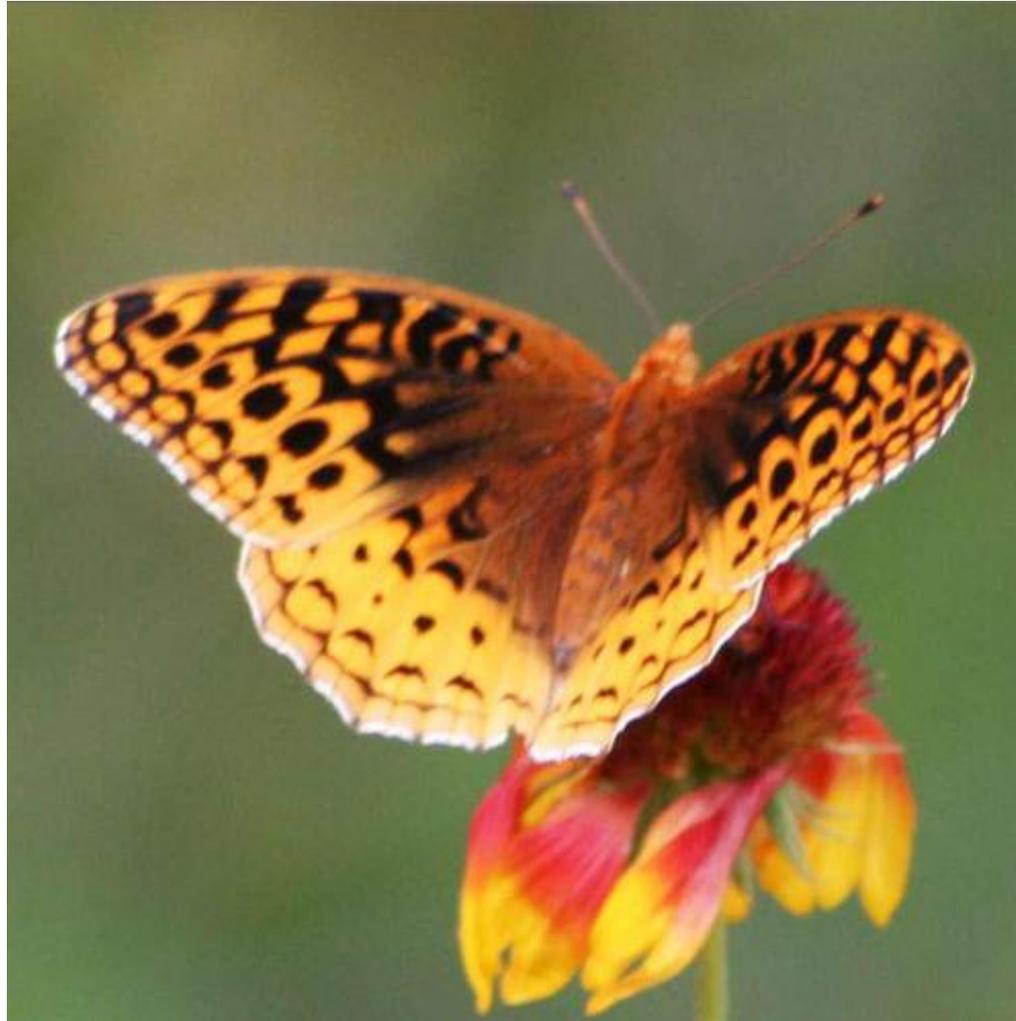
**Smithsonian National Zoological Park**

<http://nationalzoo.si.edu/Animals/BackyardBiology/UrbanNatureWatch/ButterflyWatch/>



**American / Painted Lady**  
**Smithsonian National Zoological Park**

<http://nationalzoo.si.edu/Animals/BackyardBiology/UrbanNatureWatch/ButterflyWatch/>



**Great Spangled Fritillary**

**Smithsonian National Zoological Park**

<http://nationalzoo.si.edu/Animals/BackyardBiology/UrbanNatureWatch/ButterflyWatch/>



## **Monarch**

**Smithsonian National Zoological Park**

<http://nationalzoo.si.edu/Animals/BackyardBiology/UrbanNatureWatch/ButterflyWatch/>



## **Tiger Swallowtail**

**Smithsonian National Zoological Park**

<http://nationalzoo.si.edu/Animals/BackyardBiology/UrbanNatureWatch/ButterflyWatch/>



### **Tailed Jay Butterfly**

(Jon Lelito, PSU Entomology)

<http://ento.psu.edu/extension/insect-image-gallery/all-images/tailed-jay.jpg/view>



### **Postman Butterfly**

(Jon Lelito, PSU Entomology)

<http://ento.psu.edu/extension/insect-image-gallery/all-images/postman-butterfly.jpg/view>



### **Julia Butterfly**

(Jon Lelito, PSU Entomology)

<http://ento.psu.edu/extension/insect-image-gallery/all-images/julia-butterfly.jpg/view>



### **Isabella Butterfly**

(Jon Lelito, PSU Entomology)

<http://ento.psu.edu/extension/insect-image-gallery/all-images/isabella-butterfly.jpg/view>



### **Waved Sphinx Moth**

(B. Newton, 2002)

<http://www.uky.edu/Ag/CritterFiles/casefile/insects/butterflies/butterflies.htm>



**Clearwing Sphinx Moth or Hummingbird Moth**

(B. Newton, 2005)

<http://www.uky.edu/Ag/CritterFiles/casefile/insects/butterflies/sphinx/sphinx.htm#carolina>



**Gypsy Moth (laying an egg mass)**

<http://www.ext.vt.edu/pubs/entomology/444-750/444-750.pdf>



## Leopard Moth

(Maryann Frazier, PSU Entomology)

<http://ento.psu.edu/extension/insect-image-gallery/all-images/leopard-moth-adult.jpg/view>



### **Imperial Moth**

(Maryann Frazier, PSU Entomology)

<http://ento.psu.edu/extension/insect-image-gallery/all-images/imperial-moth.jpg/view>



## **Io Moth**

(wings open)

(Maryann Frazier, PSU Entomology)

<http://ento.psu.edu/extension/insect-image-gallery/all-images/io-moth-wings-open.jpg/view>

Name: \_\_\_\_\_

## Butterfly Wing Template – Student Sheet

### Directions:

1. Partner 1 – use pattern blocks or colored squares to create the butterfly wing on the left side of the butterfly’s body.
2. Partner 2 – use pattern blocks or colored squares to create the right side wing.

**REMEMBER: The two wings should be symmetrical.**



## Topic 4: Session 4.3 – Frogs

### Session Supplies:

- Teacher-selected nonfiction book about the life cycle of frogs
- Photographs of a variety of different frogs
- Computer internet access (if possible)
- Fact pages on the pickerel frog, bullfrog, little grass frog, northern green frog, and mountain chorus frog (pg. 136-140) (or online at <http://www.dgif.virginia.gov/wildlife/information/?t=1> )
- *Sampling of Virginia Frog Length Data* sheet (pg. 141) (There are two data sheets on each page. Cut the page in half. Each student needs only one data sheet.)
- *Sampling of Virginia Frog Length Data – teacher key* (pg. 142)
- Meter stick
- *Female Frog Length Recording* sheets (pg. 143-144)
- *Male Frog Length Recording* sheets (pg. 145-146)

### Session Virginia SOL

Science	English	Mathematics	History & Social Science
2.1 a, b, c, d, e, h, i, j, k, 1 2.4 a	2.2 a, b, c, e 2.3 a, b, c, d, e 2.7 e 2.9 a, c, d, e, f 2.10 b, d 2.12 a, c, d 2.14	2.11 a	

## Session 4.3 – Frogs

Teacher Questions & Notes	Procedures
-Do you think all frogs have the same life cycle?	1. Read and discuss the teacher-selected nonfiction book about the life cycle of frogs.
	2. Show students photographs of a variety of frogs. Lead students to the understanding that different species still go through the same stages of a life cycle.
-What do you notice about the frogs?	3. Compare and contrast the photographs of the frogs. Guide students to notice the different sizes of the frogs.
	4. Tell students that they are going to look at one specific characteristic of frogs for several Virginia frog species. They will research information for each species, record it on a data table, and analyze what has been discovered.  <i>NOTE: The specific Virginia frogs for which students will gather data are:</i> a. pickerel frog b. bullfrog

## Session 4.3 – Frogs

Teacher Questions & Notes	Procedures
	<p>c. little grass frog d. northern green frog e. mountain chorus frog</p> <p>5. Give each group a blank <i>Sampling of Virginia Frog Length Data</i> sheet (pg. 141) and have them research the sizes of given species of frogs. (A teacher key is provided on pg. 142.) Have students read each fact sheet (pg. 136-140) and record their findings on the data sheet. Remind students that scientists and mathematicians always include the units of measurement. (For this activity the units are mm – millimeters.)</p> <p><i>NOTE: Options for Getting Frog Data</i></p> <p>a. Online Option: Show students how to access the Virginia Department of Game and Inland Fisheries (VDGIF) Web site and navigate to the page on frogs. They can find the information they need to complete the table at this Web site.</p> <p style="text-align: center;"><i>To access the VDGIF Web site:</i></p> <p>(1) Type in <a href="http://www.dgif.virginia.gov">http://www.dgif.virginia.gov</a> .</p> <p>(2) On the left hand side, click on Wildlife Information.</p> <p>(3) Click on Amphibians. (You may want to bookmark this site ahead of time).</p> <p>(4) Scroll down and find each species listed on the data chart.</p> <p>b. Paper Option: Give each group a printout of fact pages (pg. 136-140) for pickerel frog, bullfrog, little grass frog, northern green frog, and mountain chorus frog.</p>
	<p>6. Have students examine the table they have filled in on the <i>Sampling of Virginia Frog Length Data</i> sheet. Have them ask themselves, “What does this table tell me?” Discuss their answers as a class.</p> <p>7. Guide the students to identify the table elements - title, headings, and data.</p>
-Do you know what the “mm” on the	8. Remind students that in the habitat sessions they used a meter

## Session 4.3 – Frogs

Teacher Questions & Notes	Procedures
table stands for? -How do you think a meter stick relates to a millimeter? -Is a millimeter bigger or smaller than a meter? -Why do you think that? -What tool would you use to measure how long a mm is?	stick to measure an area. Discuss what they know about millimeters.
-Is a millimeter bigger or smaller than a centimeter? Than a meter? -Why would a scientist measure a frog's length in mm and not cm or m? -What else could you measure in mm?	9. Tell students that what they recorded on the table was scientific data. Scientists measure actual frogs to determine their length.  10. Pass out the <i>Female Frog Length Recording</i> sheets (pg. 143-144) and the <i>Male Frog Length Recording</i> sheets (pg. 145-146). Ask, "Who can tell me what they see?" When students have noticed the lines, tell students to put a finger on five and another finger on six. Ask them to count the number of lines from finger to finger. Ask them if it is true that there are nine lines and ten spaces between any two numbers on the strip? Mathematicians and scientists call the spaces between each line a millimeter.
	11. Have students use the data they collected to mark each frog's length on the <i>Male and Female Frog Length Recording sheets</i> . <i>The data they collected is a range. You will need to decide whether to have students mark the upper end of the range or the lower end of the range on their recording sheets. For consistency, all students should use the same value.</i>
-What do you notice about the length of the different species of frogs? -How is the length of the male frog different from the length of the female frog? -How does a bullfrog compare to a pickerel frog?	12. Have students record specific statements about the data in their journal using both the table and their visual representations of the frogs' lengths. Typically students will record statements such as: The pickerel frog is 46-64 mm. Although this is an important step, you will want to guide students to also make comparisons amongst the data. For example, the male Little Grass frog is shorter than the female Little Grass frog.
-Why do you think frogs are different sizes? - How do you think this helps them to survive within their own habitat?	13. Have students find a partner and share their statements. Then discuss them as a class.

A very good source of photographs of Virginia frogs is the Department of Game and Inland Fisheries Website - [www.dgif.virginia.gov](http://www.dgif.virginia.gov).



- Hunting
- Fishing
- Boating
- Wildlife Watching
- Wildlife Information**
- Habitat
- Education
- Licenses
- Permits
- Forms
- About VDGI

## bullfrog (*Rana catesbeiana*)

### Characteristics

This is the largest native frog with the males from 85-180 mm, and females from 89-200 mm. They are broad in body with the color greenish drab, and yellowish white below. This species breeds from May-August. The egg mass is a large floating mat up to a meter wide. Territories are established by croaking and defended by vocalizations, postures, and combat. The voice is a croak said to resemble the distant roaring of a bull.

### Distribution

This species is aquatic and prefers larger bodies of water than most other frogs. This species is rather general in habitat selection, and may be found in a great variety of aquatic situations.

### Foods

This species will eat almost anything living that it can at least partially swallow. Insects and crayfish the most important food item in this species' diet. The consumption of plant food is considered accidental.

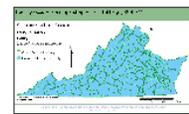
### More Information

For more information, please visit the [Virginia Fish & Wildlife Information Service](#) (direct link to species booklet).

### Photos



### Distribution Map



Virginia.gov Online Services | Commonwealth Sites | Help | Governor

 Virginia Department of Game and Inland Fisheries

Home » [Wildlife Information](#) » [Species Information](#) » [Amphibians](#) » little grass frog

- Hunting
- Fishing
- Boating
- Wildlife Watching
- Wildlife Information**
- Habitat
- Education
- Licenses
- Permits
- Forms
- About VDGIF

## little grass frog (*Pseudacris ocularis*)

### Characteristics

This species is very small with the males 11.5-15.5 mm and the females 12.0-17.5 mm. The general coloration is variable from tan, brown, greenish, pink, to reddish, with a dark line passing through the eye and onto the side of the body. There is usually a narrow dark mid-dorsal stripe starting as a triangle between the eyes and extending to the anal region. This species breeds from January to September in shallow grassy ponds. About 100 individual brown and cream eggs are laid on the bottom of ponds and in vegetation in shallow water. Climbing is restricted to low vegetation, and the voice is a tinkling insect-like call, *set-see, set-see*.

### Distribution

This frog is found in southeastern Virginia. It is most often found in moist grassy areas near ponds, bogs, pools or streams in hardwood forests and wooded swamps. Breeding sites are largely restricted to flooded grassy areas including roadside ditches, logged areas, meadows, emergent shrub wetlands, flooded pastures.

### Foods

This frog climbs on low vegetation near shallow ponds in search of insects.

### More Information

For more information, please visit the [Virginia Fish & Wildlife Information Service \(direct link to species booklet\)](#).

© 2008 Virginia Department of Game and Inland Fisheries  
[Web Policy](#)  
WAI-A Compliant

#### Photos



#### Distribution Map



Photo by Paul Sattler



- Hunting
- Fishing
- Boating
- Wildlife Watching
- Wildlife Information**
- Habitat
- Education
- Licenses
- Permits
- Forms
- About VDGIF

## mountain chrous frog (*Pseudacris brachyphona*)

### Characteristics

This species is gray or brown in color with 2 curved stripes on the back. The stripes may touch in the center of the back to form a crude dark 'X'. A dark triangle between eyes is usually present and there is a white line on the upper lip. The males are 24-32 mm, and the females are from 27-34 mm. This species breeds from March to July. There are 10-50 eggs that are attached to vegetation or trash. The egg complement is from 300-1500. They are often found long distances from the water. This species breeds in shallow woodland pools. The voice is a rasp, suggestive of a wagon wheel turning without benefit of lubrication.

### Distribution

This species is found on forested hillsides often near springs and rivulets and may range upward to elevations of at least 3,500 feet. It breeds in shallow pools in woods or at its edge. Breeding habitat consists of virtually any small standing body of water including roadside ditches, seepages, and flooded pastures adjacent to streams.

### Foods

The chorus frogs climb little and only into weeds in pursuit of insects.

### More Information

For more information, please visit the [Virginia Fish & Wildlife Information Service](#) ([direct link to species booklet](#)).

### Photos



### Distribution Map

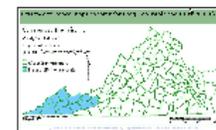


Photo by Paul Sattler

- Hunting
- Fishing
- Boating
- Wildlife Watching
- Wildlife Information**
- Habitat
- Education
- Licenses
- Permits
- Forms
- About YDGIF

## northern green frog (*Rana clamitans melanota*)

### Characteristics

This species is brown or greenish with dorso-lateral folds that do not extend to the groin and with no light line along the upper jaw. The length of the male is 52-77 mm, and the female is 58-75 mm. The belly is white to gray and the throat is dusky or yellowish, or bright yellow. The tadpoles are olive green and large, up to 64 mm. It breeds from May through August. The eggs are black and white, 1.5 mm in diameter. This species is considered the most active of all native frogs, and is capable of enormous leaps. The voice is like a pluck of a banjo string.

### Distribution

This species can be found wherever there is shallow fresh water and are fairly widespread in Virginia.

### Foods

This species will eat any living thing it can capture and swallow.

### More Information

For more information, please visit the [Virginia Fish & Wildlife Information Service](#) (direct link to species booklet).

### Photos



### Distribution Map

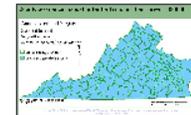


Photo by Paul Sattler



# Virginia Department of Game and Inland Fisheries

- Hunting
- Fishing
- Boating
- Wildlife Watching
- Wildlife Information**
- Habitat
- Education
- Licenses
- Permits
- Forms
- About VDGIF

## pickerel frog (*Rana palustris*)

### Characteristics

This is a medium sized frog, males 46-64 mm, females 49-79 mm. They are gray or tan with a double row of squarish blotches between the complete dorsolateral folds. The belly is white or yellowish. The concealed surface of the hind legs yellow or orange. This species breeds from April to May and often gathers in large numbers in small areas. The brown and bright yellow eggs are submerged, attached to twigs or grass stems and number 2000-3000. The eggs are 1.6 mm in diameter. This species is quite active, often found far from water in the summer. The voice is a weak snore with a duration of 1 to 3 seconds and calls are given from above and below the water. Few snakes will eat pickerel frogs because of noxious skin secretions.

### Distribution

The pickerel frog is found statewide except for extreme Southeastern Virginia and much of the Eastern Shore. This species is often found in sphagnum bogs, rocky ravines, and meadow streams.

### Foods

The pickerel frog is an insectivore.

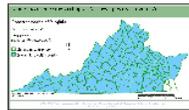
### More Information

For more information, please visit the [Virginia Fish & Wildlife Information Service](#) (direct link to species booklet).

### Photos



### Distribution Map



© John White

Name: \_\_\_\_\_

### A Sampling of Virginia Frog Length Data – Student Sheet

Record the lengths of these frogs.

<b>Type of Frog</b>	<b>Male</b>	<b>Female</b>
Pickerel frog		
Bullfrog		
Little Grass frog		
Northern Green frog		
Mountain Chorus frog		

Name: \_\_\_\_\_

### A Sampling of Virginia Frog Length Data – Student Sheet

Record the lengths of these frogs.

<b>Type of Frog</b>	<b>Male</b>	<b>Female</b>
Pickerel frog		
Bullfrog		
Little Grass frog		
Northern Green frog		
Mountain Chorus frog		

## A Sampling of Virginia Frog Length Data - Teacher Key

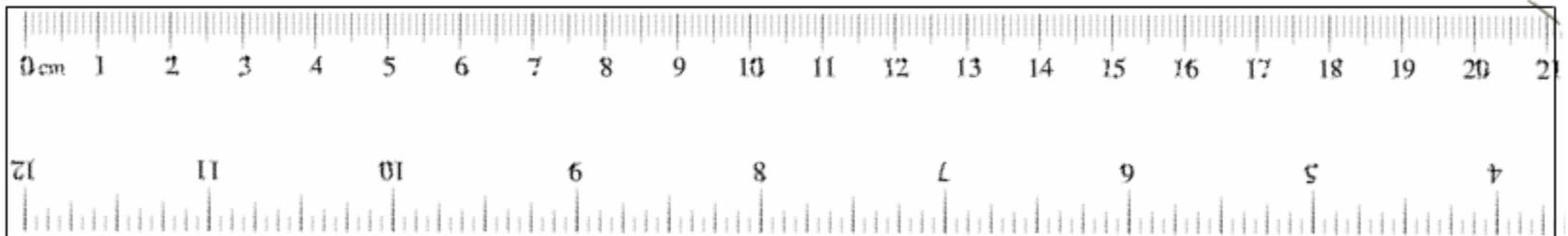
<b>Type of Frog</b>	<b>Male</b>	<b>Female</b>
Pickerel frog	46-64 mm	49-79 mm
Bullfrog	85-180 mm	89-200 mm
Little Grass frog	11.5-15.5 mm	12-17.5 mm
Northern Green frog	52-77 mm	58-75 mm
Mountain Chorus frog	24-32 mm	27-34 mm

Name: \_\_\_\_\_

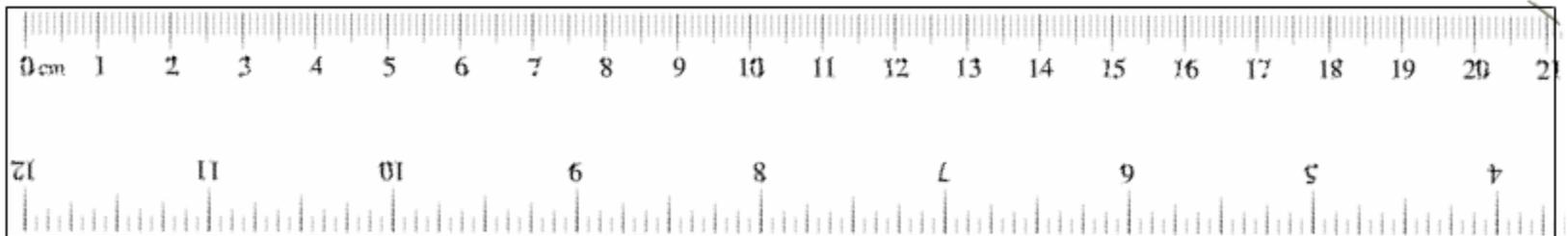
### Female Frog Length Recording – Student Sheet

Use the Virginia frog length data to shade in the length of each species of frog on the rulers below. Color neatly!

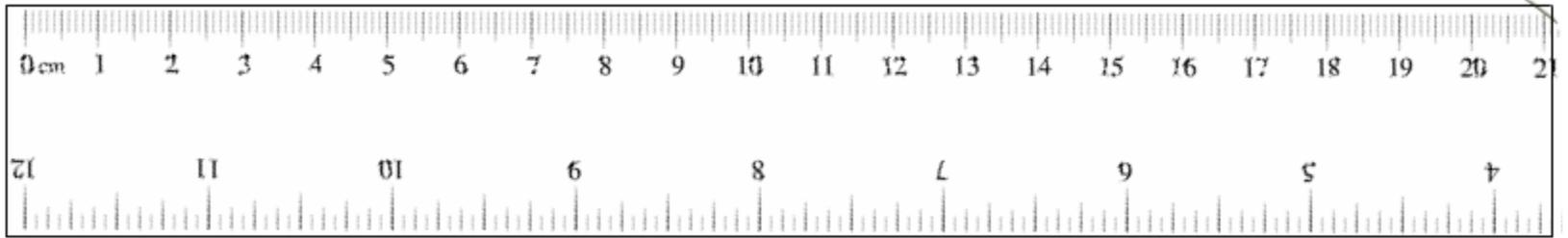
Pickerel frog



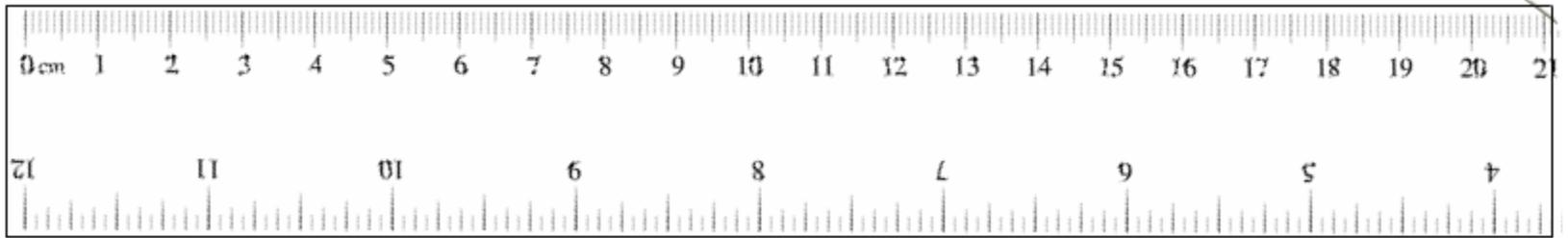
Bullfrog



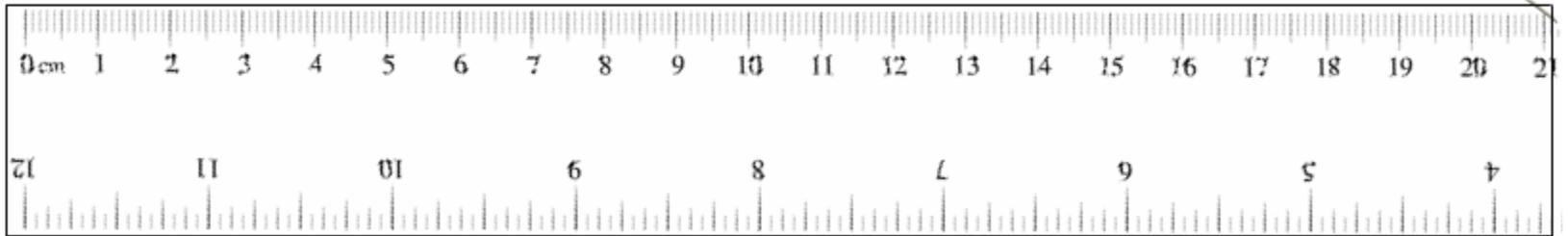
Little Grass frog



Northern Green frog



Mountain Chorus frog

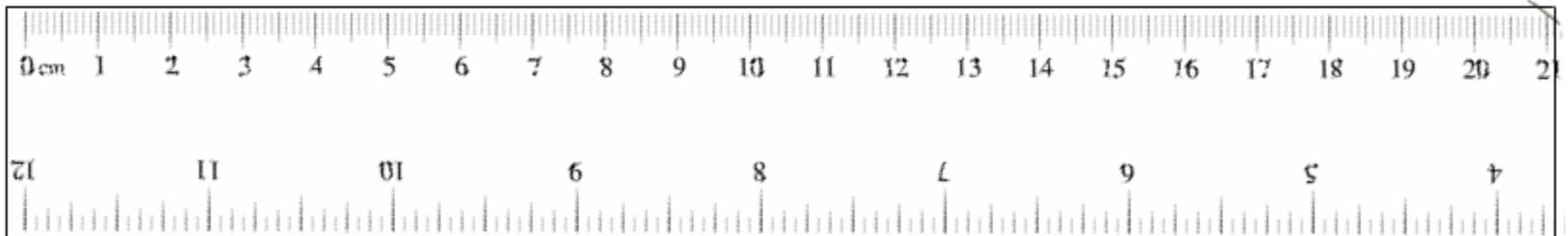


Name: \_\_\_\_\_

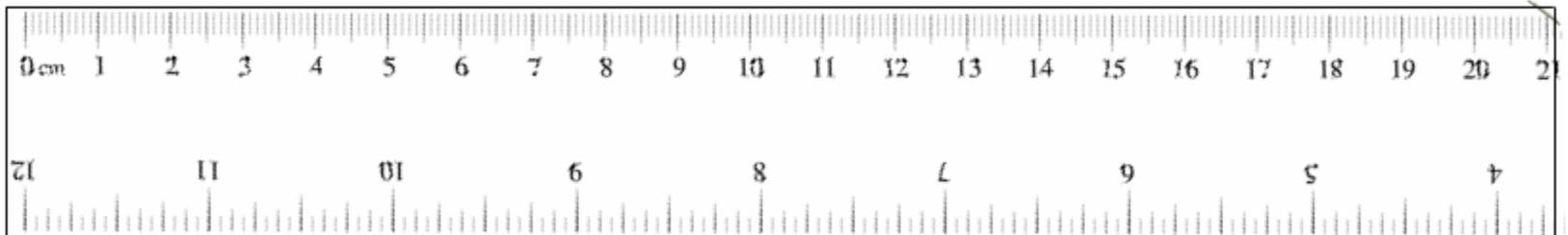
### Male Frog Length Recording – Student Sheet

Use the Virginia frog length data to shade in the length of each species of frog on the rulers below. Color neatly!

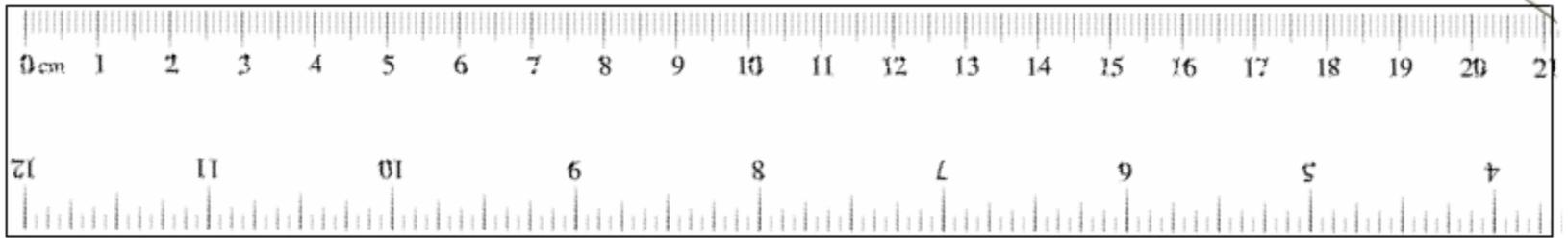
Pickerel frog



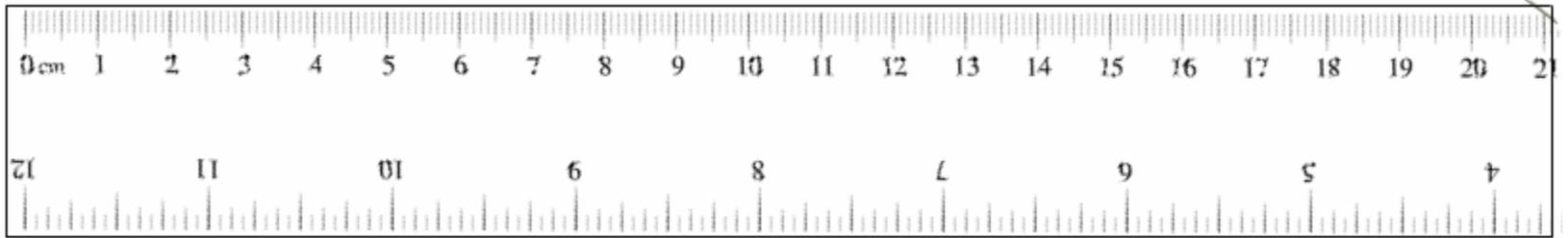
Bullfrog



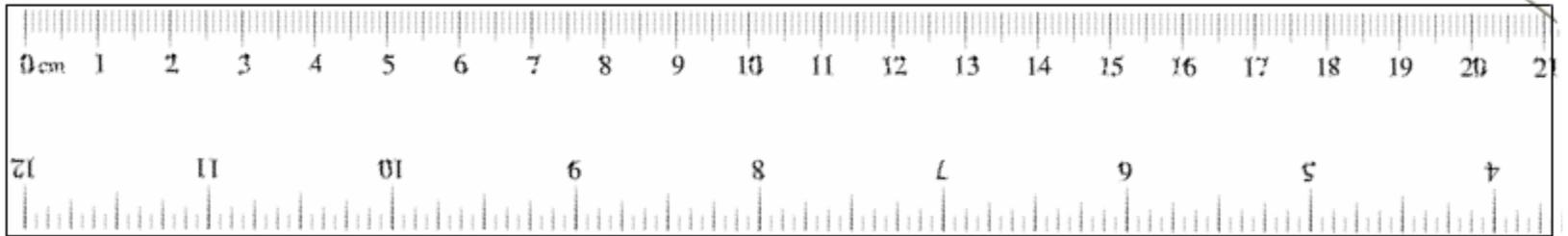
Little Grass frog



Northern Green frog



Mountain Chorus frog



## Topic 4: Session 4.4 – Life Cycle Models

### Session Supplies:

- Materials for students to make models - plates, different kinds of macaroni noodles, beans, cotton, crayons, clay, construction paper, etc.
- Scissors
- Glue

### Session Virginia SOL

Science	English	Mathematics	History & Social Science
2.1 i, j, k, l 2.4 a	2.1 c, d, e 2.2 a, b, c, e 2.3 a, b, c		

## Session 4.4 – Life Cycle Models

Teacher Questions & Notes	Procedures
	<p><b>Topic 4, Session 4</b></p> <p><i>Prior to this session, the teacher will need to gather materials for students to use when creating their life-cycle models. A list of suggested supplies can be found in the materials section, but you may use any materials you have available. This session may need to be broken into two sessions depending on time available.</i></p>
	<ol style="list-style-type: none"> <li>1. Scientists record information in a variety of ways. Students will demonstrate what they have learned by constructing a model of the life cycle of a butterfly, a moth, or a frog.               <ol style="list-style-type: none"> <li>a. Show students the available supplies. If technology is available, you may give students the option to create a PowerPoint, claymation, etc.</li> <li>b. On the board, list three criteria for their projects:                   <ol style="list-style-type: none"> <li>i. Your model must show the four life-cycle stages.</li> <li>ii. Your model must be labeled.</li> <li>iii. Your model must include a fact sheet that has at least two additional facts about the butterfly, the moth, or the frog.</li> </ol> </li> </ol> </li> <li>2. Have students construct their models.</li> <li>3. Have students present their models to the class.</li> <li>4. Using the information learned during the life-cycle presentations, create a class Venn diagram comparing the butterfly, the moth, and the frog life cycles. Also include at least one other animal (e.g., dog, grasshopper, squirrel). Included on the Venn diagram can be information about their life cycle, habitat, physical</li> </ol>

## **Session 4.4 – Life Cycle Models**

<b>Teacher Questions &amp; Notes</b>	<b>Procedures</b>
	<p>characteristics, adaptations, etc. The goal is for students to reiterate the fact that some animals like butterflies, moths, and frogs go through a complete metamorphosis as they mature to adults (the baby and adult look nothing alike) and some animals do not go through metamorphosis as they grow and mature (the baby looks similar to the adult).</p>

## Topic 4: Session 4.5 – Project Work Time: Life Cycles

### Session Supplies:

- Design Brief for the project – a copy should be located in each team project notebook and was introduced in Topic 3, Session 3.4
- *Life Cycle Planning* sheet (pg. 150)

### Session Virginia SOL

Science	English	Mathematics	History & Social Science
2.1 i, j, k, l 2.4 a	2.7 d, e 2.12 2.14		

## Session 4.5 – Project Work Time: Life Cycles

Teacher Questions	Procedures
	<p>PROJECT WORK TIME:</p> <ol style="list-style-type: none"> <li>1. Review the design brief of each team’s written report.</li> <li>2. Have students work in their project teams and give them the <i>Life Cycle Planning</i> sheet (pg. 150). Some teams may need additional planning sheets. Teams will use the <i>Life Cycle Planning</i> sheet to show how their animal grows from a newborn baby to an adult.</li> <li>3. Each team will use their project planning sheets and available resources (e.g., books, textbook, Internet) to research their animal’s life cycle.</li> <li>4. By the end of this project work time, each team should complete a team <i>Life Cycle Planning</i> sheet for their team animal.</li> <li>5. At the end of this project work time, each team member should also complete a reflection page in their journal based on the team’s work on their animal’s life cycle.</li> </ol>

Name: \_\_\_\_\_

### Life Cycle Planning Page – Student Sheet

<hr/> <hr/> <hr/> <hr/>	<hr/> <hr/> <hr/> <hr/>
<hr/> <hr/> <hr/> <hr/>	<hr/> <hr/> <hr/> <hr/>

## ***Acknowledgments***

Copyright © 2010

by the

Virginia Department of Education

P. O. Box 2120

Richmond, Virginia 23218-2120

<http://www.doe.virginia.gov>

in partnership with the

Virginia Department of Game and Inland Fisheries

4010 West Broad Street

Richmond, VA 23230

<http://www.dgif.virginia.gov>

All rights reserved. Reproduction of these materials for instructional purposes in public school classrooms in Virginia is permitted.

## **Virginia Department of Education**

### **Superintendent of Public Instruction**

Patricia I. Wright

### **Assistant Superintendent for Instruction**

Linda M. Wallinger

### **Office of Standards, Curriculum and Instruction**

Mark R. Allan, Director

Barbara P. Young, Science Specialist

Deborah Wickham, Mathematics Specialist

Thomas Santangelo, Reading Specialist

Betsy Barton, History and Social Science Specialist

## **Virginia Department of Game and Inland Fisheries**

### **Executive Director**

Robert W. Duncan

### **Wildlife Education Coordinator / Project WILD Coordinator**

Suzie Gilley

We wish to express our gratitude to the following individuals for their contributions to the development of the *Virginia Animals and their Habitats* grade two cross-curricular unit.

Ginna Glover  
Retired, Virginia Department of Education

Barbara Adcock  
Powhatan County Public Schools

Erin Adams  
Hanover County Public Schools

Debbie Davis  
Chesterfield County Public Schools

Sheri Dixon  
Hanover County Public Schools

Sandra Kelish  
Stafford County Public Schools

Branch Pronk  
Stafford County Public Schools

## **Special Thank You for Permission to Use Items in Virginia Animals and their Habitats**

We wish to express our gratitude to the following for granting permission for the use of photographs and/or lessons in *Virginia Animals and their Habitats* grade two cross-curricular unit.

Great Sand Dunes National Park and Preserve  
Mosca, Colorado

*Roo-Rats Elementary Teachers Lesson Plans*  
*\*Insect Workbook*

Ohio Department of Natural Resources – Division of Wildlife  
Columbus, Ohio

*Twenty/Twenty-Projects and Activities for WILD School Sites*  
*\*Insect Safari*

Pennsylvania State University – Department of Entomology  
State College, Pennsylvania

*Insect Image Gallery*

- \*Tailed Jay Butterfly (Jon Lelito, photographer)*
- \*Postman Butterfly (Jon Lelito, photographer)*
- \*Julia Butterfly (Jon Lelito, photographer)*
- \*Isabella Butterfly (Jon Lelito, photographer)*
- \*Leopard Moth (Maryann Frazier, photographer)*
- \*Imperial Moth (Maryann Frazier, photographer)*
- \*Io Moth (Maryann Frazier, photographer)*
- \*Giant Swallowtail Butterfly Caterpillar (Maryann Frazier, photographer)*
- \*Pandora Sphinx Moth Caterpillar (Maryann Frazier, photographer)*

Smithsonian National Zoological Park  
Washington, DC

*Animals – Backyard Biology*

- \*Black Swallowtail Butterfly*
- \*American Painted Lady Butterfly*
- \*Great Spangled Fritillary*
- \*Monarch Butterfly*
- \*Tiger Swallowtail Butterfly*

University of Kentucky – Extension Entomology  
Lexington, Kentucky

*University of Kentucky Entomology Kentucky Critters*

- \**Waved Sphinx Moth* (Blake Newton, photographer)
- \**Clearwing Sphinx Moth* (Blake Newton, photographer)
- \**Pipevine Swallowtail Caterpillar* (Ric Bessin, photographer)
- \**Spicebush Butterfly Caterpillar* (Ric Bessin, photographer)
- \**Fritillary Caterpillar* (Ric Bessin, photographer)
- \**Monarch Caterpillar* (Ric Bessin, photographer)

USDA Forest Service  
Washington, DC

*The NatureWatch, Wildlife, Fish, and Threatened and Endangered Species  
Program's Photograph Library*

- \**Prince Baskettail* (David Arboux, photographer)
- \**Argiope Spider* (David Arboux, photographer)

Virginia Department of Forestry  
Charlottesville, Virginia

- \**Measuring Tree Height*

Virginia Department of Game and Inland Fisheries  
Richmond, Virginia

*Wildlife Information*

- \**Eastern Gray Fox* (Dave Schaffer, USFWS, photographer)
- \**Virginia Opossum* (John White, photographer)
- \**White-tailed Deer* (Lee Walker, photographer)
- \**White-tailed Deer Fawn* (WJ Berg, USFWS, photographer)
- \**Black Bear* (Steven Ferguson, photographer)
- \**Eastern Gartersnake* (John White, photographer)
- \**Black Vulture*
- \**Gray Squirrel* (Jeff Trollinger, photographer)
- \**Eastern Box Turtle* (John White, photographer)
- \**Osprey*
- \**American Toad* (John White, photographer)
- \**Largemouth Bass*
- \**Bullfrog* (Bob Greenlee, photographer)
- \**Little Grass Frog* (Paul Sattler, photographer)
- \**Mountain Chorus Frog* (Paul Sattler, photographer)
- \**Northern Green Frog* (Paul Sattler, photographer)
- \**Pickerel Frog* (John White, photographer)
- \**Insects student sheet*
- \**A Look Outside DVD*

- \*Compare Yourself to a Black Bear student sheet*
- \*Virginia map with no labels*
- \*Tundra Swan 888 Migration Path*
- \*Tundra Swan 893 Migration Path*
- \*Tundra Swan 894 Migration Path*

Virginia Tech – Department of Entomology  
Blacksburg, Virginia

*Insect Identification Lab*

- \*Gypsy Moth (E.A. Roberts, Senior Research Associate, Department of Entomology; Virginia Tech)*
- \*Tent Caterpillar*
- \*Green-striped Mapleworm*
- \*Gypsy Moth Caterpillar (E.A. Roberts, Senior Research Associate, Department of Entomology; Virginia Tech)*
- \*Hickory-Horned Devil*
- \*Saddleback Caterpillar*
- \*Fall Webworm Caterpillars*