



# Pond Water and Pollywogs

## Unit Summary

The local zoo has a new amphibian exhibit and needs a newsletter to help visitors understand and appreciate frogs. On their way to becoming frog experts, students investigate the universal features of habitats, observe frogs in their natural environment, and raise frogs from eggs in an artificial habitat. Students record their observations and reflections in words and pictures in a science log, and use a spreadsheet to record their data collection. They show their understanding of habitats in general and the specific features of a frog habitat in a slideshow presentation. Students create a newsletter illustrating the frog life cycle and habitat, both natural and man-made, and give specific details about the frog exhibit.

## Curriculum-Framing Questions

- **Essential Question**  
Why do people say, "There is no place like home"?
- **Unit Questions**  
How do frogs fit into where they live?  
How does a frog's classroom home compare to its home in the wild?
- **Content Questions**  
What is the life cycle of a frog?  
What is *pH*, and what can it tell us about the health of a pond?  
What is needed for a healthy frog habitat?

## Assessment Processes

View how a variety of student-centered [assessments](#) are used in the Pond Water and Pollywogs Unit Plan. These assessments help students and teachers set goals; monitor student progress; provide feedback; assess thinking, processes, performances, and products; and reflect on learning throughout the learning cycle.

## Instructional Procedures

### In Preparation for the Unit

To introduce the project-based learning scenario, prepare a [letter](#), addressed to the class, describing the zoo's frog exhibit. This will appear to have been written by someone at the zoo (or you could actually have someone at the zoo write a letter on official letterhead) requesting students' help.

If collecting frogs from the wild, determine rules for collection and release of animals in the area (the state department of fish and wildlife is a good starting place). Arrange for frog eggs to be collected or delivered.

Get an aquarium (approximately 20 gallons) and materials necessary for a tadpole/frog habitat (see the [Resources](#) section for habitat requirements). Gather frog videos, books, printed materials, and electronic resources, and line up an amphibian's expert to visit the classroom.

### Introduce the Project

On the first day of the unit, "deliver" a letter from the local zoo to the class. Read and discuss the letter, and develop the scenario. Discuss frogs, and start a Know-Wonder-Learn (K-W-L) chart to record prior knowledge and questions about frogs. Chart ideas as well as thoughts on steps students can take to answer their questions. Present and discuss the Essential Question, *Why do people say, "There is no place like home"?* Have students discuss the question as a whole group, covering topics such as why they like their homes, what activities they do at their homes, and why homes are important. Record student responses on chart paper. Students could draw pictures of their homes and write words to represent why their homes are important to them. This could be the first entry in their frog observation journals.

In their journals, students record ideas and thoughts, using writing and drawing. [Observation journal questions](#) are used

### At a Glance

**Grade Level:** K-2

**Subjects:** Life Science

**Topics:** Frogs, Biology

**Higher-Order Thinking**

**Skills:** Analysis, Investigation

**Key Learnings:** Diversity, Habitat, Interdependence, Life Cycle, Metamorphosis

**Time Needed:** 12-15 weeks, 45-minute lessons, daily

**Background:** [From the Classroom](#) in Maryland, United States

### Things You Need

[Assessment](#)

[Standards](#)

[Resources](#)

to probe understanding throughout the course of the unit, with students writing, drawing, or dictating responses. In a discussion, compare what frogs and people need to grow. Record similarities and differences on a T-chart. Introduce the term *habitat* as the concept that encompasses comparisons among homes, diets, air and water usage, and so forth.

Have students record what they believe to be the necessary features of a frog habitat in their journals. Share ideas and chart them on chart paper for students to refer to throughout the unit. For homework, challenge students to come up with a list of essential features of a frog habitat.

### **Learning about a Frog's Habitat**

At the end of the first week, visit a local pond as a class and observe a natural frog habitat. Have students gather the evidence they need to begin to address the Unit and Content Questions:

- *How do frogs fit into where they live?*
- *How does a frog's classroom home compare to its home in the wild?*
- *What is pH, and what can it tell us about the health of a pond?*
- *What is needed for a healthy frog habitat?*

Have students photograph the site and features of the pond to refer back to when setting up the aquarium at school. (Digital images are also useful for later projects and presentations.) Using various instruments, have students measure and record water quality. The pH (alkalinity/acidity), temperature, and dissolved oxygen are three factors of water quality that can be measured. Kits for testing pH and dissolved oxygen can be found at many pet stores.

After the field trip, revisit the Content Question, *What is needed for a healthy frog habitat?* Ask students to respond to the question in their frog journals by illustrating and labeling the features of the frog habitat they observed. In groups, have students discuss the characteristics of the frog habitat and develop a list of criteria for their artificial frog habitat. Develop the K-W-L chart further. Using a book on amphibian husbandry, elaborate on habitat requirements that may not have been developed thus far, and have students record new information in their journals.

Instruct students to complete either or both of the following activities:

- Using the frog habitat criteria developed by the students, have students paint murals of frogs in their natural habitat. Have students label the illustrations, and post the murals around the room.
- Using field guides and illustrations for reference, have students paint or draw frogs indigenous to the region. Have students add captions that synthesize what they learned about the frogs.

The drawings become a dynamic part of the project as students add to them throughout the course of the unit.

Help students apply their knowledge of natural habitat by working as a class to create the aquarium habitat for the frog eggs. After the new habitat is constructed, revisit the Unit Question, *How does a frog's classroom home compare to its home in the wild?* Construct a Venn diagram to depict similarities and differences between the two habitats.

### **Data Gathering and Organization**

Help students address and answer the Content Question, *What is the life cycle of a frog?* Students experience the developmental process firsthand, from egg to frog. Have students use the [frog life cycle spreadsheet](#) to record observations every few days. Students can use the spreadsheet either by printing it and writing their observations in the spreadsheet cells, or by entering data into the spreadsheet directly on the computer. The first entry occurs when eggs are first placed in the aquarium. The first page of the spreadsheet is used to record data from their observations of the eggs. As the frog develops, have the students use the next four pages of the spreadsheet—tadpole, tadpole with legs, froglet, and adult frog—to record their observations. Guide students as they draw their observations of frog development, record dates of entry, and write, if possible, about the changes they see. Water quality (pH, temperature, and dissolved oxygen) should be tested and recorded daily, and modified as needed.

Periodically, have students demonstrate their understanding by having them answer questions in their journals (see the [observation journal questions](#)).

### **Student Multimedia Presentation**

Have students create a class [slideshow](#) on habitats in general and a frog habitat in particular to share with the another class at school. Tell students the presentation must answer the following questions:

- *How do frogs fit into where they live?*
- *How does a frog's classroom home compare to its home in the wild?*
- *What is pH, and what can it tell us about the health of a pond?*
- *What is needed for a healthy frog habitat?*
- *Why do people say, "There is no place like home"?*

Also tell the class that the presentation must include the following components as supporting evidence for the questions:

- Title slide
- Introduction to the frog project
- Explanation of elements of a healthy frog habitat
- Description of the creation of an artificial frog habitat
- Description of observations

- Comparison of natural and artificial habitats
- Description of why a home is important to a frog

Have students collaborate in small heterogeneous groups, and assign one of the preceding components of the presentation to each group. Then, assign a role to each member of the group, with roles rotating among members. The timekeeper, the typist, the supply gatherer, and the supporter are sample roles that can be used. Pass out the [presentation self-assessment](#) and review requirements. Model using the assessment with students, so they are aware of expectations, and then check for understanding. Have students develop a rough draft of group work on a storyboard planning sheet prior to creating the slideshow. Use a template to structure the presentation. Slide details, sequence, transitions, and timing can be determined by class consensus as slides are organized into a class show.

### Research Activities—Frog Life Cycle

Using the Curriculum-Framing Questions to focus learning, have students gather more information about the frog life cycle. Make sure students continue writing questions that arise in their journals. These are used as the basis for class discussion. As students study, tell them to record interesting information in their journals.

Introduce the frog life cycle in a puzzle format. Using the [life cycle diagram](#), create enough puzzle packs for pairs of students to share. To make the puzzles, cut the diagrams apart, and separate pictures from labels. To re-create the puzzles, have students put the diagrams in order, and match the diagrams to the correct labels. After completing the puzzles, encourage students to read the captions aloud to one another.

Students can document the frog life cycle on a large poster as they watch their frogs develop. Throughout this research period, enlist adult helpers or upper-grade buddies to assist students with reading, writing, and computer use.

### Student Newsletter

Have students summarize the unit content and apply it to create a newsletter for zoo visitors. Working in groups, have each group develop one component of the newsletter. When rough drafts are complete, arrange for students to meet with another group, so students can get feedback and suggestions for improvement. When revisions are complete, have students submit their contributions. Enlist the help of an adult to assemble the newsletter. Make sure the [newsletter](#) includes the following components:

- Introduction explaining the Pond Water and Pollywogs Unit Plan study
- Planning process by which a habitat was created for the developing frogs
- What a frogs eats in the wild and how frogs gather food
- What a frog is and whether it makes a good pet
- Book review
- Comparison of frogs and toads
- Life cycle of a frog, with pictures and captions
- "About the authors" information and resource information
- Digital pictures, graphics, or scanned artwork

### Revisiting the Essential Question and Wrapping Up

Have students look back at the K-W-L chart created at the beginning of the unit. Discuss the questions they posed, and then begin to fill out the LEARN section with student ideas. Point out how exciting it is that they have learned so much information about habitats and frogs! Pose the Essential Question, *Why do people say, "There is no place like home"?* again to students. Have students share their ideas in small groups and then discuss with the whole class, reminding them to use examples from their frog study.

Instruct students to make one last entry in their frog observation journal about what they learned about habitat and frogs. Consider choosing one of the following final prompts:

- Using all you have learned, draw the life cycle of the frog. Label your drawing with important information.
- Draw a picture of a frog's natural habitat. Show everything a frog needs to be happy and healthy.
- Draw a picture of the frog's artificial habitat that we created in class. Show everything we included.
- *How are the two habitats the same? How are they different? How might one be better than the other, and in what ways?*

Adding pictures of students participating in the frog study would be a great addition to their journals.

Use the [science content scoring guide](#) to assess student work, participation, and understanding of science-related content.

### Prerequisite Skills

- Basic computer navigation skills (including using a mouse and keyboard)
- Reading
- Research using books and the Internet
- Writing

### Differentiated Instruction

#### Resource Student

- Arrange students in heterogeneous groups as described in the three projects to allow every student to experience success
- Give the student additional adult assistance, extra work time, and task modifications as needed

### **Gifted Student**

- Allow the student to help others and serve as an expert in reading, writing, and technology use
- Encourage the student to do research on an aspect of frogs that is not focused on in class

### **English Language Learner (ELL)**

- Ask the ELL teacher to help the student translate basic terms into an English/first language glossary, and post translated terms around the room for all students to learn
- Have the ELL teacher explain difficult concepts to the student and help the student complete journal entries
- Pair bilingual students with nonnative speakers for tasks that require reading and writing
- Allow the student to complete journal writing in the student's first language for later translation
- Adapt assignments for the student
- Give the student additional time to complete tasks as necessary

### **Credits**

Lisa-helen Shapiro participated in the Intel® Teach Program, which resulted in this idea for a classroom project. A team of teachers expanded the plan into the example you see here.

# Designing Effective Projects: Pond Water and Pollywogs From the Classroom

## **A Resourceful School**

Lisa-helen Shapiro teaches first grade at Washington Grove Elementary School in Gaithersburg, Maryland. Her school is a Phase 1 Tech Mod school, which, simply put, means it's using technology to good ends. Washington Grove has one computer for every four students. Many of the staff have participated in the Intel® Teach Program and are skillfully integrating technology into their lessons.

## **A Qualified Teacher**

Lisa-helen came to teaching several years ago, after being employed in a variety of jobs. "I worked in a myriad of different fields before finding myself," she says. "Right before I went to school to get my degree in teaching I worked in retail. I also worked with severely handicapped children in Rochester New York. I worked with several AIDs organizations in my area as well. I don't know if any of these life experiences have made me a better teacher, or if it's something that you just have, or if it's just age... I like to think it's a little bit of all three." Lisa-helen continues to develop professionally. She is pursuing a master's degree in education technology at Johns Hopkins, and works as a master trainer in the Intel® Teach Program.

## **Systematic Technology Choices**

Teachers at Washington Grove help students use an AGOPP (Ask, Gather, Organize, Prepare, Present) research strategy to guide their project work. This overarching structure makes choosing how and when to use technology fairly easy for Lisa-helen. "I look at the separate phases of a project, and determine how technology is going to be helpful to me or support the students' learning. I consider the skills and the content of the curriculum, and I use the ISTE National Education Technology Standards, and it comes together naturally. My goal is for seamless integration, technology flowing into a project invisibly. I don't let technology take over, and I never use technology for technology's sake."

## **Early Learners and Technology**

In first grade, Lisa-helen knows technology choices need to be thoughtfully made and developmentally sound. Lisa-helen introduces technology gradually in small measures, starting the year with demonstrations of the various tools. Over time, students take on more electronic tasks themselves, and by the end of the year they are pecking out words, navigating, creating files and saving their work. Whether it's keying survey data in a spreadsheet or producing a slideshow, students have been introduced to a wide variety of tools they can use at every phase of their learning. The Internet becomes a useful resource, too. Lisa-helen focuses her students' efforts by building closed Web sites that guide them to useful, age-appropriate resources.

## **Pond Water and Pollywogs**

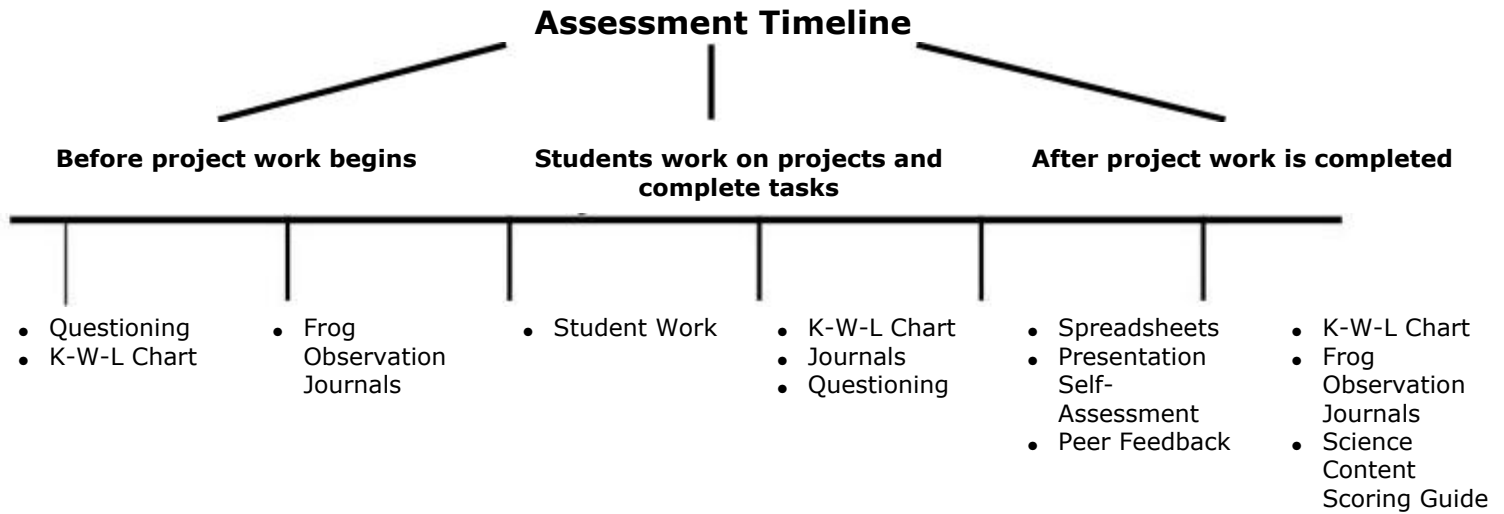
This progressive accumulation of technology skills culminates in the "Pond Water and Pollywogs" study. "This unit is a natural fit," Lisa-helen reflects, "Because the separate skills that are taught and developed through the year come together in this project." During frog habitat studies, students take digital photographs of frog habitat, use thermometers and water quality test kits, see their data put in spreadsheets to make graphs, and contribute their ideas to slideshows and newsletters. "Kids are so empowered. They can work like scientists, and they can produce work that shows what they do is important, because it's polished and professional looking."

## **Hurricanes! Hooray!**

Project work is important to Lisa-helen and her team. "We see more discussion, true discussion about important matters—the way kids interact, it's almost adult-like." An engaging project focuses student effort, and using computers focuses it even more., "At times, it's harder for me, especially at the planning and preparation phases," Lisa-helen says, "And when projects start I'm tearing around facilitating lots of activities at once. Project days are harder than paper and pencil days, but the kids are so charged, so deeply engaged, it's worth it." Lisa-helen was getting ready to write a hurricanes Web quest over the weekend "We'll have a bunch of happy little hurricanes experts when we're through," she says.

# Designing Effective Projects: Pond Water and Pollywogs Assessment Plan

## Assessment Plan



Prior knowledge of frogs and a frog's life cycle is assessed and built on using a K-W-L chart. Higher-order thinking is prompted throughout the unit through class discussions and use of the Curriculum-Framing Questions. Students demonstrate their learning on an ongoing basis as they respond to questioning within their frog observation journals. Use the [observation journal questions](#) as prompts for students to respond to through writing, drawing, and discussions. Frequent probing for understanding allows for monitoring and adjusting of instruction in a responsive way.

The students' understanding of science content is assessed using the [science content scoring guide](#). This scoring guide should be used to assess students' observational journal entries and student work, including homework, in class work, and newsletter. Student groups receive and offer peer feedback on their newsletter contributions and have an opportunity to self-assess their own work for the slideshow presentation using the [presentation self-assessment](#).

# Designing Effective Projects: Pond Water and Pollywogs

## Content Standards and Objectives

### Targeted Content Standards and Benchmarks

#### Maryland Content Standards

##### Skills and Processes

- Students demonstrate the thinking and acting inherent in the practice of science.

##### Life Science

- Students use scientific skills and processes to explain the dynamic nature of living things, their interactions, and the results from the interactions that occur over time.

##### Environmental Science

- Students use scientific skills and processes to explain the interactions of environmental factors (living and nonliving) and analyze their impact from a local to a global perspective.

#### National Content Standards

##### Science: Grades K-4

- Develop abilities necessary to do scientific inquiry
- Develop understanding about scientific inquiry

##### Life Science: Grades K-4

- Know the characteristics of organisms
- Know life cycles of organisms
- Know organisms and environments

#### National Educational Technology Standards (NETS)

##### Technology: Grades K-2

- Use input devices (such as mouse, keyboard, and remote control) and output devices (such as monitor and printer) to successfully operate computers, VCRs, audiotapes, and other technologies
- Use a variety of media and technology resources for directed and independent learning activities
- Use developmentally appropriate multimedia resources (such as interactive books, educational software, and elementary multimedia encyclopedias) to support learning
- Create developmentally appropriate multimedia products with support from teachers, family members, or student partners
- Use technology resources for problem solving, communication, and illustration of thoughts, ideas, and stories

### Student Objectives

#### Students will be able to:

- Understand a frog's life cycle and development by hatching frog eggs and observing tadpole growth and development
- Describe the characteristics of frogs and compare them to characteristics of toads
- Describe the characteristics of amphibians as contrasted to fish, reptiles, or mammals
- Describe a frog's habitat and how it supports the life of a frog
- Work cooperatively in small groups
- Document observations in a journal or learning log
- Ask questions, gather research, organize information, prepare data, and present findings in writing

# Designing Effective Projects: Pond Water and Pollywogs

## Resources

### Materials and Resources

#### Printed Materials

- Bartlett, R. D. (1996). *Frogs, toads and treefrogs*. Hauppauge, NY: Barron's Educational Series, Inc.
- Gibbons, G. (1993). *Frogs*. NY: Holiday House.
- Lobel, A. (1970). *Frog and toad are friends*. New York: HarperCollins Publications.
- Pfeffer, W. (1994). *From tadpole to frog*. New York: HarperCollins and Let's Read-and-Find-Out.

#### Supplies

- Aquarium and tadpole/frog habitat supplies
- Basic art supplies
- Butcher paper
- Poster paper
- Tempera paints
- Storyboards/templates for designing slideshows
- Water quality test kits, available at pet stores or [Carolina Biological Supply Company](#)\*

#### Internet Resources

- All About Frogs for Kids and Teachers  
[www.kiddyhouse.com/Themes/frogs](http://www.kiddyhouse.com/Themes/frogs)\*  
Tips for creating a wildlife habitat in your own backyard
- Center for Global Environmental Education: A Thousand Friends of Frogs  
<http://cgee.hamline.edu/frogs>\*  
A resource for children, parents, educators, and scientists to study and celebrate frogs and their habitats
- Exploratorium: Frogs  
[www.exploratorium.edu/frogs](http://www.exploratorium.edu/frogs)\*  
From an Exploratorium exhibit, includes frog articles, interactive exhibits, and hands-on activities
- The Froggy Page  
[www.frogsonice.com/froggy](http://www.frogsonice.com/froggy)\*  
A frog resources site, includes a section of links to frog stories
- Froggyville  
[www.froggyville.com](http://www.froggyville.com)\*  
A frog resource site that includes directions for setting up an ideal frog habitat
- Frogs!  
[www.bry-backmanor.org/gardenfun/froggies.html](http://www.bry-backmanor.org/gardenfun/froggies.html)\*  
Includes free frog clip art
- Frogs and Toads for Children  
<http://web.ukonline.co.uk/conker/pond-dip/frogs.htm>\*  
Students can send in their work to this site
- Frogs at EnchantedLearning.com  
[www.enchantedlearning.com/themes/frog.shtml](http://www.enchantedlearning.com/themes/frog.shtml)\*  
Printouts for noncommercial, educational use
- The Frogs of New England  
<http://library.thinkquest.org/11034>\*  
Facts, anatomy, life cycle, and habitat information for 11 species of frogs in the New England area
- Sounds of North American Frogs CD  
[www.folkways.si.edu/search/AlbumDetails.aspx?ID=2421](http://www.folkways.si.edu/search/AlbumDetails.aspx?ID=2421)\*  
View the album and listen to examples of frog sounds
- Thorntown Zoo WebQuest  
[www.bsw.primetap.com/Zoo.html](http://www.bsw.primetap.com/Zoo.html)\*  
Includes links to habitat information and other animal Web sites
- TrackStar  
<http://trackstar.4teachers.org/trackstar/index.jsp>\*  
Search for tracks already created on frogs and use as a resource in the classroom

#### Technology—Hardware

- Computers to create slideshow and newsletter projects



- Digital camera to take pictures of the pond and of students participating in the project
- Internet connection to locate frog and habitat information
- Printer to publish newsletter to send to parents

### **Technology—Software**

- Encyclopedia on CD-ROM to research frogs and habitats Internet
- Web browser to research frogs and habitats
- Publishing software for newsletter publications
- Presentation software for slideshows

## Observation Journal Questions—Pond Water and Pollywogs

These questions are posed at different learning points in the unit. Students are encouraged to respond through drawing and writing, or dictation. Students can copy vocabulary from a unit word bank poster that has developed through the course of the unit. Possible responses are shown in parentheses.

1. What makes a frog a frog? *(Frogs are amphibians, so they live in water and on land at different life stages. Frogs have squat bodies, long muscular hind legs, moist smooth skin, and bulging eyes.)*
2. How do frogs grow? *(Ask this question repeatedly through the course of the unit.)*
3. How are frogs and toads different? *(Frogs have strong, long, webbed hind feet for leaping and swimming, Frogs have smooth or slimy skin. Frogs tend to like moist environments, and they lay eggs in clusters. Toads have stubby bodies with short hind legs for walking instead of hopping. Toads have warty and dry skin, are usually found in drier climates, and they tend to lay eggs in long chains.)*
4. What do tadpoles and frogs eat? *(Tadpoles eat algae, tiny pond creatures, and decomposing plant and animal material. Adult frogs hunt insects and worms mostly, but also eat smaller fish and frogs.)*
5. What does a frog habitat look like? How does this habitat help frogs?
6. What does our classroom habitat for frogs need?
7. What is *pH*, and what can it tell us about the health of a pond?
8. What changes happen to a frog egg while becoming a frog?
9. What is needed for a healthy frog habitat?
10. What is the life cycle of a frog?
11. What do you know about frogs now that you didn't know before?
12. What frog questions would you like to investigate next?

# Pond Water and Pollywogs Scoring Guide



| 4   | 3                   | 2   | 1                          |
|---|---------------------|---|----------------------------|
| I am an expert. I can teach or help others. | I can do it myself. | I can do it with a little help from others. | I need the teacher's help. |

| Task   | Score | Comments |
|--|-------|----------|
| <b>Life Cycle</b>                                      |       |          |
| I explain the life cycle of a frog.                    |       |          |
| I draw the life cycle of a frog.                       |       |          |
| I describe a frog's habitat.                           |       |          |
| I tell how the habitat supports the frog.              |       |          |
| <b>Classifying</b>                                     |       |          |
| I know what makes an animal an amphibian.              |       |          |
| I explain how frogs and toads are alike and different. |       |          |
| <b>Scientific Investigation</b>                        |       |          |
| I use what I know to make a guess.                     |       |          |
| I test my guess.                                       |       |          |
| I ask questions.                                       |       |          |
| I gather information.                                  |       |          |

|  |  |  |
|--|--|--|
| I write about what I see.                                  |  |  |
| I draw pictures and charts to show what I see or find out. |  |  |
| I sort results.  |  |  |
| I write about what I learned.                              |  |  |
| <b>Technology</b>  |  |  |
| I use the keyboard to type words.                          |  |  |
| I add a picture to a slide.                                |  |  |

|          |                  |           |                         |
|----------|------------------|-----------|-------------------------|
| <b>4</b> | <b>3</b>         | <b>2</b>  | <b>1</b>                |
| Always   | Most of the time | Sometimes | I need to work on this. |

| <b>Task</b>                      | <b>Score</b> | <b>Comments</b> |
|----------------------------------|--------------|-----------------|
| <b>Work Habits</b>               |              |                 |
| I finish all parts of a project. |              |                 |
| I work well with others.         |              |                 |
| I listen to others.              |              |                 |
| I share my ideas.                |              |                 |
| I do my best.                    |              |                 |

# Slideshow Presentation Self-Assessment
















Name \_\_\_\_\_

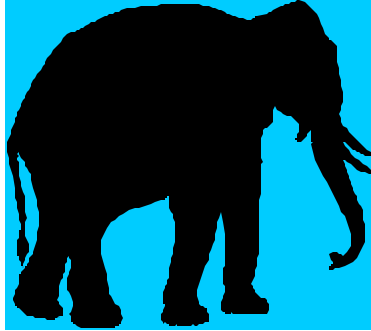
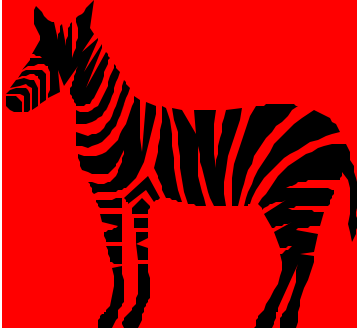
## Key

☺ = I did an excellent job!

☹ = I did an okay job.

☹ = I need to improve.

|   | Always  | Sometimes  | Never   |
|---|---|--|---|
| I listened to group members.                    |    |    |    |
| I worked well with group members.               |    |    |    |
| I gave my ideas.                                |  |  |  |
| I worked hard.                                  |  |  |  |
| I helped make a slide with correct information. |  |  |  |



**Baltimore Zoo | Druid Hill Park | Baltimore, Maryland**

**Hours: Open daily, year-round 10 a.m.-4 p.m.**

**Admission: Adults (ages 16-61) \$10 | Seniors (ages 62+) \$6 |**

**Children (ages 2-15) \$6 | Children under 2 are free**

April 10, 2005

Lisa-Helen Shapiro  
Washington Grove Elementary School  
8712 Oakmont Avenue  
Gaithersburg, Maryland 20877

To Miss Shapiro and Her First Grade Class:

The Baltimore Zoo is hosting a new exhibit on amphibians and frogs next month. When we heard that you were beginning a study of frogs in your class, we thought we would ask for your help. We need informational brochures about frogs for the exhibit. These brochures should include a diagram of the frog life cycle as well as some interesting facts about frogs. Please include information about your class and your frog habitat, since we are also asking other schools to participate in this project. If you are interested in assisting us, please contact me at the number listed below. And remember, Maryland school groups receive free admission to the zoo! Call to reserve your field trip and receive planning materials and activities for your class.

Thank you!

John Smith

Education Coordinator of the Baltimore Zoo





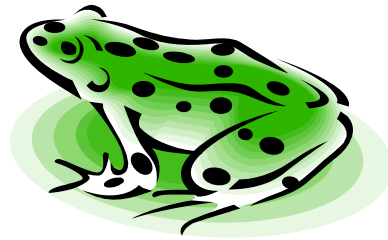




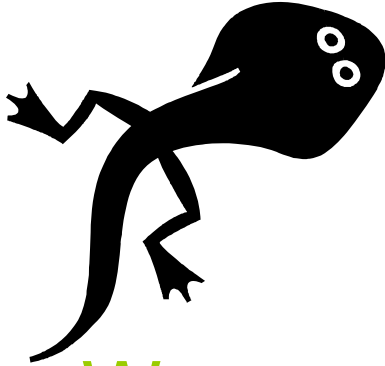




# Pond Water and Pollywogs



Miss Shapiro's Class



# Our Frog Project

- We are raising frog eggs so they can turn into frogs.
- We have an aquarium in our classroom where the eggs are living. We made sure that the water is healthy for the frogs to survive and that its habitat is like where its home is in the wild.
- We are going to watch them every day to see what happens and write in our journals.

# A Healthy Habitat

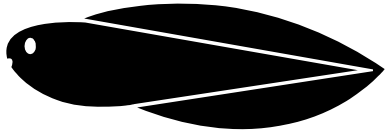
- Tadpoles need:
  - good water quality.
  - the right water temperature.
  - algae and moss.
  - some sunshine and some shade.
- Frogs need:
  - good water quality.
  - the right water temperature.
  - Insects to eat.
  - rocks to climb out of the water.
  - some sunshine and some shade.



# What We Did



- We got an aquarium.
- We used water from the pond to put in our aquarium.
- We put the eggs in the water.
- We made sure the aquarium got some sunlight and some shade.
- We watched the eggs closely every day.



# What We Saw

- The eggs hatched and we saw little tadpoles that looked like baby fish with tails.
- We fed them boiled lettuce.
- We also changed the habitat and added a pile of rocks so they could climb out when they grew their front legs.
- Then the tadpoles grew legs and started to become frogs!
- We started to feed them meal worms and some flies.
- Then they lost their tails and looked like real frogs. It was time to put them back into the pond.





# Natural and Artificial Habitats

- Natural Habitat:
  - Good water quality
  - Sunshine
  - Shade
  - Lots of space
  - Rocks
  - Moss
  - Algae
  - Insects
  - Other animals
- Artificial Habitat:
  - Good water quality
  - Some sunshine
  - Some shade
  - Small aquarium
  - A few rocks
  - Some moss
  - A few insects





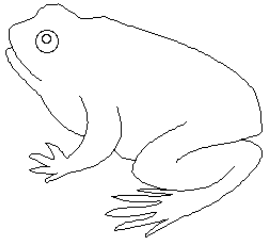
# There's No Place Like Home

- We loved watching the eggs hatch and turn into tadpoles and then frogs. Some of the tadpoles died but many turned into frogs.
- The frogs liked their home in our classroom but when they got big there wasn't enough space for them.
- They were happy when we put them back into their pond home where they had a lot of space to swim and jump.



# Frog Life Cycle Diagram Puzzle

Cut out the pieces on the dotted lines. Mix up the pieces. Then match the labels with the pictures and put them in the correct order.

|  |  |   |   |   |
|--|--|---|---|---|
|   |   |   |    |    |
| <p><b>Stage 1—Egg</b><br/>Tiny frog eggs are laid in masses in the water by a female frog. The eggs hatch into tadpoles.</p> | <p><b>Stage 2—Tadpole</b><br/>Tadpoles are also called <i>pollywogs</i>. This stage hatches from the egg. The tadpole spends its time swimming in the water, eating, and growing. Tadpoles breathe using gills, and they have tails.</p> | <p><b>Stage 3—Tadpole with Legs</b><br/>In this stage, the tadpole sprouts legs (and then arms), has a longer body, and has a more distinct head. It still breathes using gills and has a tail.</p> | <p><b>Stage 4—Froglet</b><br/>In this stage, the almost mature frog breathes with lungs and still has some of its tail.</p> | <p><b>Stage 5—Adult Frog</b><br/>The adult frog breathes with lungs and has no tail because it has been absorbed by the body.</p> |



# Pond Water and Pollywogs

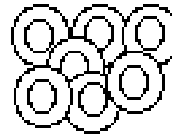
## The Eggs Have Arrived!

On April 20 our frog eggs arrived. Samantha's dad collected the eggs from the Grove Park Pond in Washington Grove.

He collected the eggs in a large water cooler over the past week and they will stay there until we finish setting up the aquarium.

We are all very ex-

cited to watch what will happen to the eggs over the next few weeks! Please come and visit our new friends them develop with us.



Frog eggs

Miss Shapiro's First Grade Class

Volume 1, Issue 1

April 20

### Fun Frog Facts:

- ☺ Frogs eat bugs.
- ☺ Frogs and toads are cousins.
- ☺ Frogs don't give you warts.
- ☺ Frogs are cold-blooded.

### Inside this issue:

|                       |   |
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## What Is a Frog?

A frog is a cold-blooded animal. A frog spends part of its life in water. An animal that lives part of its life in the water and part

of its life on land is called an *amphibian*. A toad is also part of the amphibian family.

## Creating the Best Habitat for Our Frogs

Frogs start their lives in water. When Samantha's dad collected the eggs from Grove Pond he also collected some of the water. Water is important to the tadpoles when they hatch because they don't have lungs yet. The



Adult Tree Frog

frogs breathe through

gills just like fish. We tried to make our aquarium look like a small pond. We put some large rocks and some sticks in the aquarium. The rocks will give the tadpoles a place to hide when they hatch.

## What Does a Frog Eat?

Different frogs eat different things. Most frogs eat small insects, like crickets and flies. Some frogs eat grasses and flowers. The African Bull

Frog eats small animals called *rodents*. A rodent is an animal like a mouse or a rat.

eat goldfish food until we release them into the courtyard pond at our school.

When our eggs hatch, they will be tadpoles. Our tadpoles will

## What Will Happen? Next?

After we have set up the aquarium for the frog eggs, we will have to wait for them to hatch. When they hatch, they will look

like little fish. They will have long tails. They will breathe through gills. The tadpoles will live underwater until they have

grown back and front legs. Once the frogs are adults, we will put them back in the pond to live.

## Is a Frog a Good Pet?

A frog can be a very good pet if you remember some rules.

First, always wash your hands after handling a frog.

Second, when you pick a frog, make sure that you know what kind of frog it is.



Frogs eat grasshoppers.

Third, remember that frogs are not like a dog or a cat. Frogs

don't like to cuddle or give hugs.

Last, frogs eat live bugs, so you need to make sure that you can get them easily. Also, you need to know what kind of a habitat your frog needs. Usually frogs need a wet environment.

## Can Frog and Toad Be Friends?

In book club, we read *Frog and Toad Are Friends* by Arnold Lobel. This book is fiction. There are different stories about Frog

and Toad's adventures. There is a story about Toad losing a button. In another story, Toad gets a headache trying to think of a story to

tell Frog. It is a very funny book.

Sarah says, "Toad is my favorite character. He is funny."

## Frogs and Toads—Are They the Same?

Frogs and toads are amphibians. They lay their eggs in water. Frog and toad tadpoles live in the water until they have grown their



front and back legs. Frogs live near or in the water. Toads live on land and lay their eggs in water. Toads have drier skin with bumps. Frogs have smooth skin. Frogs have long legs for

hopping. Toads have short legs for walking.

All toads are frogs but not all frogs are toads.

# Miss Shapiro's First Grade Class

This newsletter was created by the students in Miss Shapiro's homeroom class. All information for the newsletter was researched by the students with the help of the Internet, Encarta encyclopedia, text-books, and Miss Shapiro. We have learned a lot of stuff about frogs and only some of it has been shared in our newsletter. Please come

visit us and our frogs so you can learn more too.



## Interesting Frog Web Sites

All About Frogs for Kids and Teachers  
[www.kiddyhouse.com/themes/frogs](http://www.kiddyhouse.com/themes/frogs)

Exploratorium: Frogs  
[www.exploratorium.edu/frogs](http://www.exploratorium.edu/frogs)

Frog WebQuest  
[www.geocities.com/shapirli](http://www.geocities.com/shapirli)

Frogland!  
<http://allaboutfrogs.org/frogInd.shtml>

The Somewhat Amusing World of Frogs  
[www.csu.edu.au/faculty/commerce/account/frogs/frog.htm](http://www.csu.edu.au/faculty/commerce/account/frogs/frog.htm)

## The Life Cycle of a Frog



First the eggs are laid and then hatch.



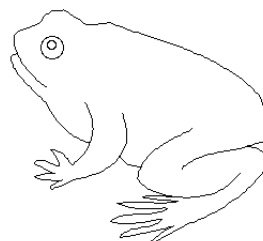
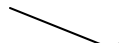
Then the pollywog is born and spends its time swimming, eating, and growing. It breathes using



Next, the tadpole sprouts legs (and then arms), has a longer body, and has more of a head. It still breathes using gills and has a tail.



Now the almost mature frog breathes with lungs and still has some of its tail.



Finally, the adult frog breathes with lungs and has no tail because it has been absorbed by the body.