



AQUATIC ECOLOGIST

Teacher's Pre & Post Trip Information

Grades: 3-8

Theme: Abundant clean water is essential for sustaining life for animals and humans.

Objectives:

- Students will be able to explain why conserving and protecting water resources in Illinois are important
- Students will be able to describe the water cycle and define watershed
- Students will analyze water quality using simple water test kits and, based on the results, predict the aquatic invertebrates that will be present
- Students will collect and identify aquatic invertebrates
- Students will identify several ways to conserve and protect water resources

Learning Plan:

Topics: Water use, water cycle, watersheds, aquatic invertebrates, pollution, water quality

Student activities: watershed activity, Who Polluted the Salt Fork, water testing, invertebrate sampling, macro-invertebrate game

Learning Area	Goal #	Standard	Level and Benchmark
Science	11	A	1a, 1d, 1f, 2b, 3a, 3c
	12	B	3a
	12	E	1a, 2a
	13	A	1a, 1c, 2a, 2c
	13	B	1a, 2f
Language Arts	4	A	1a-d, 2a-c, 3c
	4	B	1a-b, 2a-b
	5	A	1a-b
Social Sciences	17	A	1a, 1b, 2b
	17	B	1a, 1b, 2b, 3a
	17	C	1a, 2c
Physical Education	21	A	1a-b, 2a-b, 3a
	21	B	1
	22	C	1, 3a

Vocabulary:

- **Respect** – to honor, to show concern for
- **Preserve** – to keep safe, to save or protect
- **Habitat** – the arrangement of food, water, shelter and space suitable to an animal's need
- **Water cycle** – the continuous circulation of water in systems throughout the planet, involving condensation, precipitation, runoff, evaporation, and transpiration
- **Precipitation** – any form of water that falls from the sky (rain, snow, hail, sleet, etc.)
- **Groundwater** – water that has been absorbed by the soil (where it will still keep flowing 'downhill')
- **Surface water** – open water in lakes, streams, rivers, ponds and wetlands
- **Runoff** – the part of precipitation that is not held in the soil but drains freely away
- **Photosynthesis** – the process that plants use to make food using energy from the sun
- **Aquatic invertebrates** – those invertebrates that spend some or all of their lives in or on water; includes insects, mussels, arthropods, crustaceans, crayfish, etc.
- **Watershed** – the area of land that drains into a body of water
- **Pollution** – contamination of soil, water or atmosphere by the addition of harmful substances
- **Effluent** – water that is returned to the environment after being used by people
- **Water quality** – water's ability to sustain life and its suitability for human consumption. Aspects of water quality include: dissolved oxygen, pH, ammonia and nitrate.
 - **Dissolved Oxygen:** amount of oxygen in the water.
 - **pH:** Level of acidity of water.
 - **Ammonia:** Waste product of fish and other animals.
 - **Nitrate:** Found in fertilizers and human and animal waste.

Supplemental Activities:

The following activities are suggestions for use in the classroom before and/or after the school program. Not all are appropriate for all age groups. Feel free to adapt them for your students' abilities.

Science Activities:

- One Drop at a Time

Set a large bowl or bucket under a tap and turn it on so it drips once every second.

Answer the following questions.

How many cups of water do you think will be in the bowl after an hour?

Let the tap drip for an hour, and then use a measuring cup to see how many cups of water leaked out of the tap.

1. How many cups were in the bowl after one hour?
2. How many cups of water would leak out of the faucet in 1 day (24 hours)?
3. How many cups of water would leak out of the faucet in 1 year (365 days)?
How many gallons would that be? (there are 16 cups in one gallon)

Water is a very precious resource, and there are places in the U.S. where people are struggling to have enough water to go around. Even here in Illinois, we have an aquifer that we get a lot of our water from, and no one knows how long it will last. One way to save water is to make sure the faucets in your house don't drip when you're not using them. Dripping faucets waste a lot of water!

Research Activities:

- Have the students start a notebook to keep track of how much water they each use in one day. Have them mark down things like: how many times do you wash your hands, how many times do you flush the toilet, did you take a shower or a bath? Do research to find out how much water each activity uses.
- Where is the Water?

Have the students think about where the water in your school/house comes from, the water cycle, groundwater, and where the water goes from your house. Have the students do research and answer the following questions.

1. Where does the water in your school come from? (well, city water supply, etc.)
2. Where might the water in your faucet have been a day ago?
3. Where might the water in your faucet have been 200 years ago?
4. Where might it be in a week after it goes down the drain?
5. Where might it be in a year?

Writing Activities:

- Thank you Water!!

Write a letter to the water in the world, and say thank you for all the things water does for us and all the other living things on earth. Here's some ideas: water to drink, swim in, rain to water plants, animals that live in water, pretty waves, taking a shower, snow, and more!

Suggested Readings:

- **Aquatic Entomology**
McCafferty
This book provides a pictorial introduction to aquatic insects, their environment, and their relationship to human life.
- **Crawdads Creek***
Scott R Sanders
A world of discoveries awaits young readers as they follow Michael and Lizzie, who pan for gold and hunt for arrowheads. Lyrical descriptions based on the author's own childhood experiences introduce the amazing variety of wildlife that can be found in and around a backyard creek...from whirligig beetles, turtles and crawdads to rabbits, deer, and raccoon.
- **Hidden Life of the Pond**
by David Schwartz
Photographs and text introduce the animals, insects, and plants in a pond.
- **One Small Square Pond***
Donald M. Silver
Fish and fungi, plants and protists, mammals and monera all seem to get along swimmingly in and around the peaceful-looking pond environment. But a closer look

at a small square reveals an ever-changing world. . .home to a larger variety of creatures and goings-on than you'd ever imagine, even in just a drop of its water!

- **Pond and Brook: A Guide to Nature Study in Freshwater Environments**
by Michael J. Caduto
A complete guide to the plants and animals of ponds, lakes, streams, rivers, and wetlands.
- **Pond Life***
Barbara Taylor
These stunning photographic information will enthrall any child who has ever wondered how a butterfly wing looks to another butterfly or how a spider sees its own web. Text and annotations give a real sense of where each plant or creature lives, how it eats, breeds, survives, and adapts to its particular habitat.
- **The Web at Dragonfly Pond**
by Brian Ellis
Storyteller Brian "Fox" Ellis draws from his memories of fishing with his father to tell this true tale of a fish, a frog, a dragonfly, a mosquito, and himself. The experience helped mold Fox's life-long connection with nature, and is a wonderful example of entertainment that educates.

Additional Resources:

Websites

- <http://www.epa.gov/safewater/kids/> Activities for kids grades K - 12, including interactive learning. This site has a good interactive water cycle. Includes resources for parents too.
- <http://www.epa.gov/waterscience/KidsStuff/> A collection of fun facts, games, and projects for kids to learn about our water environment.
- <http://ga.water.usgs.gov/edu/msac.html> USGS Water Science Activity Center. This is the interactive section of their site where you can answer challenge questions, give opinions, and participate in questionnaires concerning water issues.
- http://water.usgs.gov/wsc/map_index.html An interactive map that shows watersheds in the US and leads you through smaller and smaller watersheds to find the one you live in.
- <http://64.78.32.69/webrangers/activities/waterquality/?id=37> This is a great interactive website where children can count macroinvertebrates to see how healthy the water is.

DNR Education Website: <http://dnr.state.il.us/lands/education/index.htm>

- Educational supplements (CD-ROMs, educational trunks, posters, books, etc.)
- ENTICE workshop schedule
- Contests and grants

Audubon Illinois Wildlife Series Display Boards

- Butterflies and Moths
- Amazing Bats
- Illinois Owls

See www.champaigncountyaudubon.org for a list of resources for loan housed at the Education Center at the Homer Lake Forest Preserve.

**Available for loan from the Education Center at Homer Lake Forest Preserve. We have many more items in addition to those listed – please call 896-2455 for more information.*

