



River WaterWorks, Inc
WaterWorks: A River Journey to the Sea
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Program Curriculum for 4th Grade Classrooms
WaterWorks: A River Journey to the Sea

I. Summary: The WaterWorks project will follow the journey of a drop of water from its origins in Lake Chautauqua, NY all the way down the Allegheny, Ohio, and Lower Mississippi Rivers as it makes its way to the Gulf of Mexico and the sea.

II. Objectives:

The WaterWorks curriculum will address the following three concepts in an hour-long interactive and inquiry based classroom presentation:

1. The Journey: Travel, Adventure, and Use of the River
2. Where Does All of the Water Come From?
3. Why Is Water Important?

The program's web presence at <http://www.riverwaterworks.org> will enable classrooms to follow the journey and participate in supplementary lessons both before and after the classroom visit.

III. National Education Standards Met:

The WaterWorks program is an interdisciplinary program constructed around National Educations Standards in the subject areas listed below. Please see part VII of this document describing the details of the program's correlations to the National Standards.

- Science
- Social Studies
- Technology
- Music
- English Language Arts

IV. Instructional Content:

The following is only one example of a lesson plan. Lessons can be modified to meet classroom needs as the teachers or instructors see fit. See Part V. Extensions for more content information.

1. The Journey: Travel, Adventure, and Use of the River (15 minutes)

- Explain where the River WaterWorks vessel started from and where it is going. Tell the story about the boat and adventure thus far and how we ended up in this school.

- Tell the stories of people who have done this journey before such as French Fur Traders, explorers like Lewis Clark, Lumber men, and Entertainers who would sing, dance, juggle, and put on plays. Perform a short vaudeville act for the class.
- What are rivers used for today? Brainstorm, make a list and include drinking water, irrigation for farming, boating, swimming, fishing, travel, trade. What products go up and down the rivers?

2. Where Does All the Water Come From? (25 minutes)

- Use visual aids to describe the water cycle: Rain->Ground->Rivers->Oceans
- Illustrate the geography that river systems coverage by referring to a map of the United States. Show the enormous amount of land that the Mississippi River Basin drains, and talk about how many states and how many miles of rivers there are in the entire system.
- Define the Watershed concept. Have students construct an interactive watershed in the classroom using numerous funnels and hoses. The funnel represents the watershed and the hose is the river that carries the water away. Show how multiple watersheds combine to form one large watershed. Show what happens when “polluted” water enters one watershed, and how it affects all the others.
- Introduce the concept of Groundwater. Demonstrate how the ground acts like a sponge and also a filter. Show how plumes of water move through different sediments using a groundwater display model.
- Discuss what an aquifer is and demonstrate with a short video clip. Show how underground lakes and rivers are similar to the lakes and rivers we see all the time, but how they move more slowly when they are underground.

3. Why is Water Important? (20 minutes)

- The health of a river reflects on the people who live around it. Use two different mirrors to show how rivers can reflect either a healthy or unhealthy way of life.
- What is biodiversity? Show students different insects collected from the river in a sample bucket. Talk about how biodiversity makes life more interesting and more healthy for all plants and animals.
- Actions people take in rivers effect everyone who lives downstream. Remember the watershed example with the funnels? We all live “downstream”! Personal responsibility.
- What can you do to conserve water? Why is water conservation important? What other questions should you ask about water? Brainstorm ideas.

V. EXTENSIONS:

This extension information will be presented on our website, <http://www.riverwaterworks.org> to use as supplementary material either before and/or after River WaterWorks visits the school.

Some of the following material could also be included in the River WaterWorks classroom presentation at the discretion of the teacher or instructor.

- Use the raw river data from YSI Data Logging Device to monitor biological, chemical and physical properties of the water. Does the temperature change? What does turbidity mean? Does the turbidity change? What might cause this? How much oxygen is there in the river? Does the amount of oxygen in the water change? What does oxygen do for creatures living in the river?
- Write about what you would do if you were traveling on the river.
- Why are there Dams on the River? What is a dam? How many are there on the rivers? Dams help to prevent floods and make it so rivers don't dry up when it doesn't rain for a long time.
- Draw a picture showing what you would see if you were floating down the river.
- Dump a cup of water into ground, and talk about the journey it takes on its way to the sea.
- Look at your shirt. Does it have buttons on it? What are the buttons made of? Demonstrate how clamshells used to be made into buttons before plastic was invented.
- Wetlands and Marshes also act like sponges and filters. Why are they important?
- Where does water from the faucet in our homes come from? It comes from Groundwater (springs), lakes (reservoirs), or rivers. The water is filtered, and sometimes stored in big towers.
- Where does the water go when it goes down the drain? Either to a Sewage Treatment Plant or a Septic System- both filters out dirty things in different ways. It can also go directly into the rivers without treatment! This can be bad.

VI. ADDITIONAL REFERENCES:

More books and web reference materials will be made available on the <http://www.riverwaterworks.org> website throughout the summer and fall of 2005.

Books to Read:

Minn of the Mississippi, by Holling C. Holling

Paddle-to-the-Sea, by Holling C. Holling

A Drop Of Water, by Walter Wick

The Magic School Bus Wet All Over: A Book About The Water Cycle, by Pat Relf

Where the River Begins, by Thomas Locker

A Drop Around the World, by Barbara Shaw McKinney, Michael S. Maydak

Websites:

<http://www.riverwaterworks.org>

<http://www.projectwet.org>

<http://www.projectwild.org>

VII. NATIONAL EDUCATION STANDARDS DESCRIPTIONS:

TECHNOLOGY FOUNDATION STANDARDS:

http://cnets.iste.org/students/s_stands.html

2. Social, ethical, and human issues: Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

3. Technology productivity tools: Students use technology tools to enhance learning, increase productivity, and promote creativity.

4. Technology communications tools: Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.

SCIENCE STANDARDS:

<http://cnets.iste.org/currstands/cstands-sK4.html>

STANDARD A: SCIENCE AS INQUIRY

A1. Abilities necessary to do scientific inquiry:

A2. Understanding about scientific inquiry:

STANDARD C: LIFE SCIENCE

C1. The characteristics of organisms

C3. Organisms and environments

STANDARD D: EARTH AND SPACE SCIENCE

D1. Properties of earth materials

D3. Changes in earth and sky

STANDARD E: SCIENCE AND TECHNOLOGY

E2. Understanding about science and technology

E3. Abilities to distinguish between natural objects and objects made by humans

STANDARD F: SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVES

F1. Personal health

F3. Types of resources

F4. Changes in environments

SOCIAL STUDIES STANDARDS:

<http://cnets.iste.org/currstands/>

III. People, Places, and Environments: Social studies programs should include experiences that provide for the study of people, places and environments, so that the learner can:

1. construct and use mental maps of locales, regions, and the world that demonstrate understanding of relative location, direction, size, and shape;
2. interpret, use, and distinguish various representations of the earth, such as maps, globes, and photographs;
3. use appropriate resources, data sources, and geographic tools such as atlases, data bases, grid systems, charts, graphs, and maps to generate, manipulate, and interpret information;
4. estimate distances and calculate scale;
5. locate and distinguish among varying landforms and geographic features, such as mountains, plateaus, islands, and oceans;
6. describe and speculate about physical system changes, such as seasons, climate and weather, and the water cycle;
8. examine the interaction of human beings and their physical environment, the use of land, building of cities, and ecosystem changes in selected locales and regions;

10. observe and speculate about social and economic effects of environmental changes and crises resulting from phenomena such as floods, storms, and drought;
11. consider existing uses and propose and evaluate alternative uses of resources and land in home, school, community, the region, and beyond.

VIII. Science, Technology, and Society: Social studies programs should include experiences that provide for the study of relationships among science, technology, and society, so that the learner can:

2. identify and describe examples in which science and technology have led to changes in the physical environment, such as the building of dams and levees, offshore oil drilling, medicine from rain forests, and loss of rain forests due to extraction of resources or alternative uses;
3. describe instances in which changes in values, beliefs, and attitudes have resulted from new scientific and technological knowledge, such as conservation of resources and awareness of chemicals harmful to life and the environment;

IX. Global Connections: Social studies programs should include experiences that provide for the study of global connections and interdependence, so that the learner can:

4. explore causes, consequences, and possible solutions to persistent, contemporary, and emerging global issues, such as pollution and endangered species;
5. examine the relationships and tensions between personal wants and needs and various global concerns, such as use of imported oil, land use, and environmental protection;

MUSIC STANDARDS

<http://www.menc.org/publication/books/prek12st.html>

6. Content Standard: Listening to, analyzing, and describing music

d. identify the sounds of a variety of instruments, including many orchestra and band instruments, and instruments from various cultures, as well as children's voices and male and female adult voices

9. Content Standard: Understanding music in relation to history and culture

a. identify by genre or style aural examples of music from various historical periods and cultures

ENGLISH LANGUAGE ARTS STANDARDS

<http://www.didax.com/standards/languagearts/>

1. Students read a wide range of print and nonprint texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information; to respond to the needs and demands of society and the workplace; and for personal fulfillment. Among these texts are fiction and nonfiction, classic and contemporary works.

5. Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.

8. Students use a variety of technological and informational resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.

12. Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).