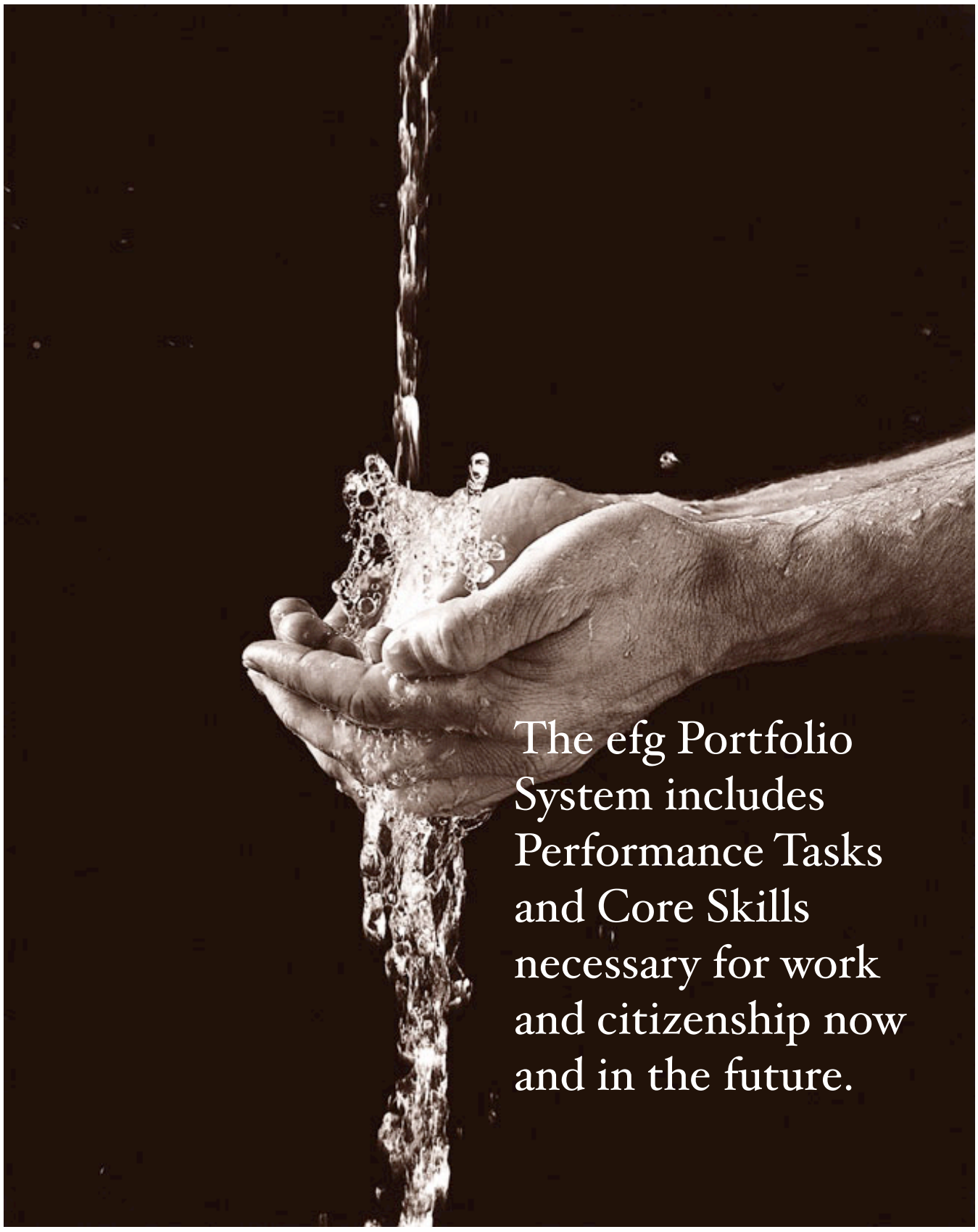
Water H²O

Vocabulary

- AQUIFER
- FLEET
- PRESSURE
- BIOLOGIST
- FLOOD
- PURIFICATION
- BIOLOGY
- GAS
- RAINFALL
- BOAT
- GEYSER
- RIVER
- CANAL
- GLACIER
- SEA LEVEL
- CAPILLARY
- ACTION
- GULF
- SHIP
- CHEMICAL
- HARBOR
- SOLID
- CHROMATOGRAPHY
- INSOLUBLE
- STREAM
- IMMISCIBLE
- SURVEY

WHAT WILL BE LEARNED

The Water H²O project will help you develop an understanding of the importance of water through the study of water sources, the water cycle, water quality and water use. It will help you develop an appreciation of water and its uses, showing the need for responsible action in protecting and preserving water as a vital, limited resource locally and globally.


The efg Portfolio System includes Performance Tasks and Core Skills necessary for work and citizenship now and in the future.

RESEARCH LOCATIONS/BOOKS

Water Science for Schools - http://ga.water.usgs.gov/edu/

The Evergreen Project - http://www.evergreen.ca/en/index.html

EPA Kid's Stuff (drinking water experiments & activities) - http://www.epa.gov/water/kids.html

American Water Works Association - http://www.awwa.org/

California Department of Water Resources - http://wwwdwr.water.ca.gov/

California State Water Resources Control Board - http://www.swrcb.ca.gov/

California Water Service - http://www.calwater.com/

Canadian Water Resources Association - http://www.cwra.org/

Castaic Lake Water Agency - http://www.clwa.org/about/about.cfm

City of Austin, TX - http://www.ci.austin.tx.us/

Educating Young People about Water - http://www.uwex.edu/erc/eypaw/

EPA Site on Water Monitoring Resources - http://www.epa.gov/owow/monitoring/

Environmental Kid's Club: Water (EPA Kids' Page) - http://www.epa.gov/kids/water.htm

Give Water a Hand (environmental education) - http://www.uwex.edu/erc/gwah/

Groundwater Education - http://www.groundwater.org/kc/kc.html

Groundwater Foundation - http://www.groundwater.org/index.html

International Rivers Network - http://www.irn.org/

Keepers of the River - http://www.tpl.org/tier3_cd.cfm?content_item_id=1440&folder_id=965

Keypals - http://www.teaching.com/keypals/

Municipal Authority of Westmoreland County, PA - http://www.mawc.org/

Osmonics - http://www.gewater.com/index.jsp

Surf Your Watershed - http://www.epa.gov/surf/

Think Earth Environmental Education Foundation - http://thinkearth.org/

USGS National Water Conditions - http://water.usgs.gov/nwc/

USGS Water Resources of US - http://water.usgs.gov/

Water Art - http://www.tomegan.net/

Water Department of Independence, MO - http://www.ci.independence.mo.us/water/index.stm

Water Education Foundation - http://www.water-ed.org/

Vocabulary

- **CONDENSATION**
- **IRRIGATION**
- **SWAMP**
- **CURRENT**
- **LAGOON**
- **THUNDER**
- **CYCLE**
- **LAKE**
- **TIDAL WAVE**
- **CYCLONE**
- **LEVY**
- **TIDE POOL**
- **DAM**
- **LIQUID**
- **TIDES**
- **DELTA**
- **MARINE**
- **WATER**
- **DENSITY**
- **MATTER**
- **WATER MOLECULE**
- **DISPLACEMENT**
- **OCEAN**
- **WATER VAPOR**
- **DIVER**
- **OCEANOGRAPHY**
- **WATERSHED**
- **DROUGHT**
- **PHYSICAL**
- **WAVE**
- **EVAPORATION**
- **PRECIPITATION**

Water Environment Federation - http://www.wef.org/
Water On-Line - http://www.wateronline.com/content/homepage/default.asp?VNETCOOKIE=NO
Water Quality Information Center - National Agricultural Library - http://www.nal.usda.gov/wqic/
Water Quality Parameters Chart - http://waterontheweb.org/under/waterquality/oxygen.html
Waterfront Trust (Lake Ontario) - http://www.waterfronttrail.org/
Waterlink - http://www.waterlink.com/index.cfm

SUGGESTIONS FOR USING WORLD WIDE WEB SITES

Read about water use, water quality, and other water issues.
Water Education Foundation - http://www.water-ed.org/
Water Quality Information Center - National Agricultural Library - http://www.nal.usda.gov/wqic/
Keepers of the River - http://www.tpl.org/tier3_cd.cfm?content_item_id=1440&folder_id=965

Conduct a mathematical analysis of the cost of different sources of water.
Municipal Authority of Westmoreland County, PA - http://www.mawc.org/
California Water Service - http://www.calwater.com/
City of Austin, TX - http://www.ci.austin.tx.us/

Find a map, graph, or chart about water quality.
Water Quality Parameters Chart - http://waterontheweb.org/under/waterquality/oxygen.html
Water Department of Independence, MO - http://www.ci.independence.mo.us/water/index.stm

Look for information about water quality in a another country.
International Rivers Network - http://www.irn.org/
Canadian Water Resources Association - http://www.cwra.org/

Research changes in water conservation and acquisition.
Water Environment Federation - http://www.wef.org/
International Rivers Network - http://www.irn.org/

Identify the technologies in purifying water.
American Water Works Association - http://www.awwa.org/
Waterlink - http://www.waterlink.com/index.cfm
Osmonics - http://www.gewater.com/index.jsp

Create an original water mural.
Water Art - http://www.tomegan.net/

Write a report about the importance of water.
Water Education Foundation - http://www.water-ed.org/
Water Quality Information Center - National Agricultural Library - http://www.nal.usda.gov/wqic/
Water Environment Federation - http://www.wef.org/

Ask students at another school about water issues in their community.
Keypals - http://www.teaching.com/keypals/

Investigate ways that people can clean up a water ecosystem in their area.
California State Water Resources Control Board - http://www.swrcb.ca.gov/
Waterfront Trust (Lake Ontario) - http://www.waterfronttrail.org/

List the scientific and water-related careers that are mentioned on these "links."
Water Education Foundation - http://www.water-ed.org/
Water Quality Information Center - National Agricultural Library - http://www.nal.usda.gov/wqic/
California State Water Resources Control Board - http://www.swrcb.ca.gov/
Water Environment Federation - http://www.wef.org/

TEST SITES

21st Century Academy, Chattanooga, TN
San Diego County Academies, San Diego, CA
Thomas Elementary School, Flagstaff, AZ
Bancroft Elementary School, Spring Valley, CA
Bellflower Middle and High Schools, Bellflower, CA
Washington Elementary School, Bellflower, CA
Robinson Elementary School, Jacksonville, FL
Palo Verde High School, Tucson, AZ
Princeton School District, Cincinnati, OH
Sabin Magnet School, Chicago, IL
St. Joseph School, Hamilton, New Zealand
Spring Branch Educational Center, Spring Branch, TX
Silver Creek High School, San Jose, CA

PARTNERSHIP POSSIBILITIES

- Aquariums
- Science centers
- Water-related companies and utilities
- YMCA
- Chamber of Commerce
- City Council
- Marinas or boat docks
- National Geographic
- University/College Environmental Science Depts.
- Red Cross
- U.S. Naval Reserve
- Fire Departments
- U. S. Coast Guard

Life2Learning Lessons

1. **LAKES AND STREAMS**
2. **RIVERS**
3. **BOTTLED WATER AND TAP WATER**
4. **CANALS AND DELTAS**
5. **WATER QUALITY**
6. **RECREATION**
7. **PORT CITIES**
8. **POWERFUL WATER**
9. **HYDROELECTRIC POWER**
10. **CONSERVATION**

Lesson 1

Lakes and Streams

RESEARCH LOCATIONS / BOOKS

Frogs - http://

www.exploratorium.edu/frogs/

Read about fresh water fish in an encyclopedia

Read library books such as: "Frogs and Toads" by Jane Dallenger

Read "Tadpoles" by Elaine Pascoe

1. READING

Recognize, sound out, and write the water vocabulary words.

- Butterfly
- Fisherman
- Pupa
- Caterpillar
- Food chain
- Reeds
- Construct
- Fresh
- Reptiles
- Cost
- Frog
- Snakes
- Creature
- Gallon
- Species
- Cubic feet
- Habitats

- Stock
- Cycle
- Lake
- Stream
- Dam
- Life
- Swamp
- Duck
- Marsh
- Water
- Duck weed
- Migrate
- Water lilies
- Egg
- Pond
- Water strider
- Fish
- Pond scum

– Read –

The Story of Lake Petersburg

Introduction

The following story is an account of how a lake was built through the effort of its citizens. Lake Petersburg came into being because of twelve people who refused to give up, regardless of the many obstacles. Lake Petersburg is located between the small town of Petersburg and Lincoln's New Salem State Park in Central Illinois. When Abraham Lincoln was a young man he lived at New Salem and he surveyed the new town of Petersburg.

The Story

Like all beginnings, a few people had a dream - not a final plan, but an idea. These people were able to visualize the task of creating a man-made lake for the benefit of the residents of Petersburg and the surrounding community. It would also benefit future generations.

A committee was formed by the Chamber of Commerce to investigate the possibility of building the lake. An engineering firm conducted a site survey. In the spring of 1959, a report was delivered and a committee, comprised of eight men, was formed to be in charge of lake planning. This committee formed a not-for-profit corporation to build and run the lake. It was called the Lake Petersburg Association.

The Association purchased property from eight owners. The cost of this purchase was $210,606.39. All of the costs of the project were paid for by lot leases and loans from people and business in Petersburg. Officers were elected for the Lake Petersburg Association. Their names were Wilber, Gerald, Bill and Thomas. Hundreds of people wanted to buy lots on the new lake. People paid $200 for a down payment and $25. for membership in the Lake Association.

The groundbreaking ceremony for the dam took place on August 7, 1961. A construction company built the dam by moving 894,000 cubic yards of earth. The cost for this work was $365,000. Before work could be started on the dam, 158,361 cubic yards of dirt had to be removed. This cost of this work was $55,000. The dam needed 571,592 cubic yards of compacted dirt. The cost was $182,909.44.

Telephone and public utility lines were completed. Roads and a water system were built. Several building were constructed and the dam was completed. Houses were built around the lake. Lake Petersburg was stocked with 25,000 large mouth, breeder bass fingerlings, 500 sunfish and 3000 channel catfish. Migrating ducks stopped at the lake.

Lake Petersburg was officially dedicated on September 2, 1963. The celebration included a ski show, food, a band concert and fireworks. All of the people in Petersburg were proud of their beautiful lake.

2. MATH

How long did it take to build Lake Petersburg? How much did it cost to build lake Petersburg? How much earth did they move to build the lake? What is a cubic yard?

3. MAPS / CHART

Make a map of a body of water in your community.

4. WORLD LANGUAGE

Recognize these vocabulary words in another language

- Clean
- Frog
- Pond
- Cost
- Lake
- Stream
- Duck
- Life
- Water
- Fish

5. SCIENCE

Describe the growth cycle of a frog. Describe a plant or animal that lives in a pond or stream. List the fish that were placed in Lake Petersburg . Describe each kind of fish

6. SOCIAL STUDIES

Describe how the Chamber of Commerce was involved in Lake Petersburg. Write a paragraph about the Chamber of Commerce in your community

7. HEALTH / FITNESS

Determine how water quality in a lake affects the health of residents surrounding the lake.

8. TECHNOLOGY

Determine how you would use technology to compare lakes or steams in different locations.

9. CREATIVE EXPRESSION

Create a water painting or mural. Make a water book mark

10. CAREERS

Identify the careers in your community or state that maintain water quality in lakes and streams. Research careers in the fishing industry and their role in lakes and streams.

11. COMMUNITY SERVICE

Develop a clean up plan for a lake or stream in your area. How would you communicate this plan? When and how often would it take place?

12. REPORT

Write a paragraph or report comparing local and national lakes that you have researched. Identify the primary sources of information that you have used.

13. PRESENTATION

Present your community service clean up plan to your school or a community agency.

Lesson 2

Rivers

RESEARCH LOCATIONS / BOOKS

California Water Service - http://www.calwater.com/

Canadian Water Resources Association - http://www.cwra.org/

City of Austin, TX - http:// www.ci.austin.tx.us/

International Rivers Network - http://www.irn.org/

Visit a town or city located on a river and identify how that river benefits business and the community.

Visit a boat dock or marina on a river.

Read:

"The Adventures of Tom Sawyer and Huckleberry Finn" by Mark Twain.

"Four Against the River" by Nancy Polishuk.

"Scuffy the Tugboat and His Adventures Down the River" by Gertrude Crampton.

"The Story about Ping" by Marjorie Flack.

Read another river book in your school or community library.

1. READING

Recognize, sound, and write the water vocabulary words.

- Acre-foot

- Dam
- Ocean
- Aquifer
- Delta
- People
- Agriculture
- Drinking
- Reclaimed
- Alligator
- Everglades
- Reservoir
- Animals
- Farming
- River
- Aqueduct
- Fish
- Soil
- Bay
- Flood
- Stream
- Boat
- Irrigation
- Swamp
- Control
- Lake
- Swimming
- Conservation
- Landfill
- Trade
- Converging
- Marina
- Transportation
- Crocodile
- Mississippi
- Tributaries
- Current
- Natural

2. MATH

Compare the length of the Mississippi River to the Nile. Identify how people make money using a river.

3. MAPS / CHART

Locate the Mississippi River and Nile on a world map. Make a map of a local river and take a picture or video tape portions of the river.

4. WORLD LANGUAGE

Use "river" words in another language.

5. SCIENCE

Describe where rivers usually begin and end. Research a water pollution disaster and the effects on plants, animals and people located near the river.

6. SOCIAL STUDIES

Write a paragraph that describes the reasons why communities were built along rivers. Answer the following questions:

What is the land called in the crescent between the Tigris and Euphrates rivers? Can you identify other locations in the world that have the same land form? What is the most important reason that people settled in river valleys? How did rivers contribute to farming and growth of cities?

7. HEALTH / FITNESS

Identify the health problems you might have if you swim in a river.

8. TECHNOLOGY

Use technology tools to compare the length and geographic location of two different rivers.

9. CREATIVE EXPRESSION

Sing songs about the River. Is there a historical significance with some of these songs? How have movies portrayed rivers? Can you name these movies?

10. CAREERS

Describe the career of a river boat captain. Identify the rivers where they might work.

11. COMMUNITY SERVICE

Identify several ways you could help prepare for or clean up after a flood.

12. REPORT

Write an article for a newspaper that encourages citizens to practice good safety rules around a river.

13. PRESENTATION

Create a power point presentation of your article and present to students at your school or a community agency.

Lesson 3

Bottled Water & Tap Water

RESEARCH LOCATIONS / BOOKS

Castaic Lake Water Agency - http://www.clwa.org/about/ about.cfm

Water Quality Information Center - National Agricultural Library - http:// www.nal.usda.gov/wqic/

Go to a grocery store or market and count the number of different brands of water. Write the brand names in your Portfolio.

Identify the size of the container and the cost for each brands of water. Write the cost next to the brand name.

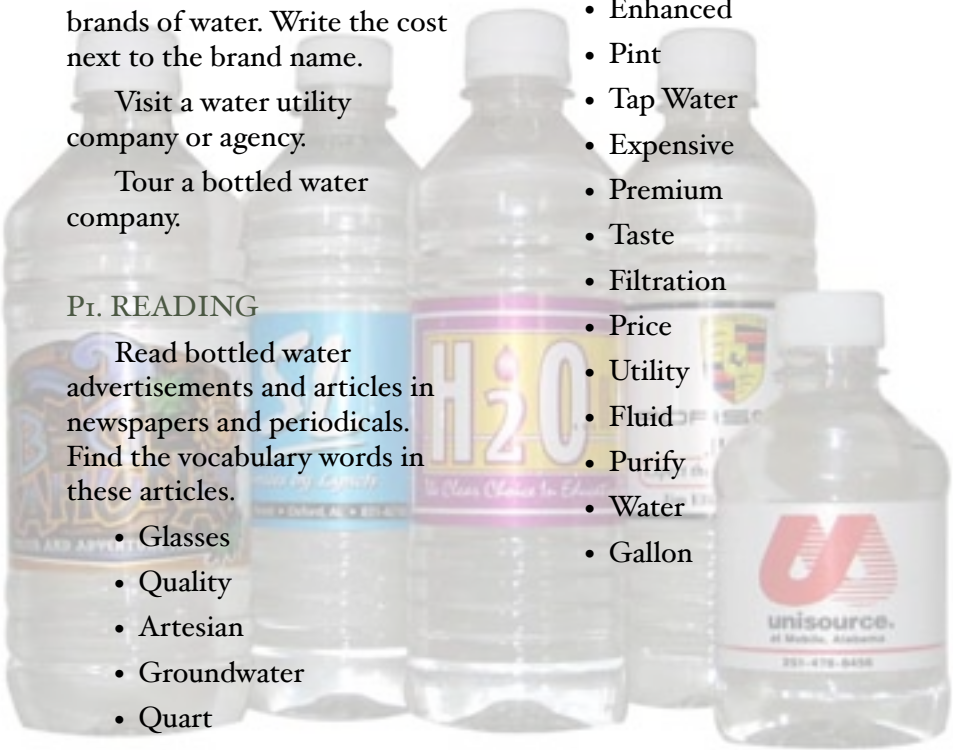
Visit a water utility company or agency.

Tour a bottled water company.

P1. READING

Read bottled water advertisements and articles in newspapers and periodicals. Find the vocabulary words in these articles.

- Glasses
- Quality
- Artesian
- Groundwater
- Quart
- Bottled
- Household
- Recycle
- Brand
- Ingredients
- Refreshing
- Comparison
- Liter
- Reverse osmosis
- Consumer
- Minerals
- Source
- Cubic feet
- Non-carbonated
- Sports
- Designer
- Nutrition
- Standards
- Drinking
- Ounces
- Storage
- Enhanced
- Pint
- Tap Water
- Expensive
- Premium
- Taste
- Filtration
- Price
- Utility
- Fluid
- Purify
- Water
- Gallon



– Read –

The Cost of Tap Water

Basically, water is free. Or at lest it starts out that way. The cost comes in delivering water. Water transported through aqueducts can be moved hundreds of miles.

Water that is moved through the California aqueduct, for example, travels 444 miles to a water agency in Southern California. there are water, city and agricultural organizations that also pay for water deliveries as it winds its way the 444 miles.

The cost for transporting water through aqueducts pays for the original construction (usually paid over may years), operation, maintenance (including some improvements). Even with these costs this water remains economical. Local storage, water quality technology and water agency costs are then added at the final destination.

If your community has groundwater, the cost is cheaper. Electric pups bring the groundwater to the surface, the water is stored in water tanks and travels only a short distance to your home.

In both cases, particularly when two types of water are used, the cost is spread out over the number of consumers in an area. In Southern California, at times, that could mean spread out over 16 million consumers!

Learning Experience

Pricing Water

What if tap water was the same price as "designer" waters? Flavored water at an upscale, trendy restaurant may run $3 for an eight-ounce glass. Compare prices with other water sources using 11,500 cubic feet per month (one cubic foot is approximately equal to 7.5 gallons) as the average household (in and around the home) usage (This usage average will vary depending on where you live.)

Water Delivery	Approximate Price	Price Per Gallon
Designer water (16 oz.)	$3.00	$24.00
Sports bottle (32 oz.)	$0.99	$4.00
Gallon jug water (128 oz.)	$99	$0.99
Five-gallon bottle (640 oz.)	$7.50	$1.50
Tap Water (1 cu.foot = 7.5 gal.)	$600. per acre-foot	$0.018

Go Figure

A. If an acre-foot is about 326,000 gallons, approximately how many cubic feet are there per acre-foot?

B. About how many cubic feet could you get for $1?

C. About how many gallons could you get for $1?

D. About how many 16 oz. glasses of tap water could you get for $1?

E. One 16 oz. glass of boutique water is how many times more expensive than a 16 oz. glass of tap water? What factors could occur that could change costs?

P2. MATH

One cubic foot is = 7.5 gallons

Gallon water jug = 128 oz

Sports bottle of water = 32 oz.

Designer bottle = 16 oz

Can you conduct a financial analysis comparing cost of different brands of bottled water? Can you compare the cost of bottled water with the tap water in your home?

P3. MAPS/GRAPHS/CHARTS

Can you make a chart of the bottled water names and prices. How would you graph the number of glasses of water that members of your family drink each day for a period of one week

4. WORLD LANGUAGE

Can you identify the bottled water names in other languages and the countries of origin?

5. SCIENCE

What are the ingredients in bottled water? How do they compare with your tap water. Can you write a brief analysis comparing bottled and tap water?

6. SOCIAL STUDIES

Identify different sources of drinking water in the world. Research and write about reasons for purchasing bottled

water. Describe a store or company that sells one type of bottled water in your community. Compare this to locations in the world where drinking water is scarce.

7. HEALTH/ FITNESS

Determine which ingredients in bottled water or tap water affect your health. Describe water sources that are not safe to drink. Identify the amount of water a person should drink per day. Are there different opinions about the amount?

8. TECHNOLOGY

How is technology used to advertise and sell bottled water?

9. CREATIVE EXPRESSIONS

Can you create a name and design a logo and label for a new brand of Bottled Water?

10. CAREERS

Identify 5 careers in the bottled water industry. How do these careers compare to those in the water utility companies?

11. COMMUNITY SERVICE

Determine how water bottles are discarded in your school or community. What type of community service could you provide and what are the benefits?

12. WRITING

Write an advertisement for a particular brand of bottled water. State multiple benefits and reasons why people would want to buy this brand.

13. PRESENTATION

Present your advertisement in print and using digital communication tools.

Lesson 4

Canals & Deltas

RESEARCH LOCATION / BOOKS

Water Environment Federation - http://www.wef.org/

Visit a canal, delta region or marina in your area.

1. READING

Identify main idea, important information and location about deltas around the world. Spell the words and use them in a paragraph.

- Canal
- Flood
- River
- Channel
- Harbor
- Sedimentation
- Convoy
- Lake
- Replenish
- Delta
- Landfill
- Ship
- Dock
- Levy
- Starboard
- Economic
- Lock
- Tides
- Ecosystem
- Ocean
- Waterway
- Fleet
- Port

– Read –

Deltas: Waterways of the World

A Delta is defined as a "triangular regions where sand and soil have been left at the mouth of a river." The definition is so simple, but the deltas and their waterways in the United States and in countries around the world are so very important in so many different ways.

Two very important deltas, for example, are the Mississippi River Delta, where the river meets the Gulf of Mexico in Louisiana and the Sacramento-

San Joaquin Rivers Delta in California, which meets San Francisco Bay and eventually, the Pacific Ocean. Each of these two deltas is critical to their region for a number of reasons, many of which are shared by other delta regions throughout the world. These reasons include being:

•a key passageway for trading, both agricultural and industrial

•a vital part of the local and regional ecosystem and perhaps its water supply

•a barometer of the water quality of its freshwater and saltwater sources

•a critical habitat area for species and plant life that thrive in brackish (a mixture of salt and fresh water) water, and for species (anadromous, like a salmon) which pass back and forth between fresh and salt water

Learning Experiences

In the learning experience below you will explore and discover the similarities and differences between delta regions of the world. You will need a standard world atlas and access to resource materials in your library, resource center or on software programs and internet sites.

Step A

Using an atlas (physical relief) or a geography software program, locate the following ten delta regions around the world (identified by delta name, country/ state location and the continent):

1. Sacramento-San Joaquin, U.S.A., North America
2. Amazon, Brazil, South America
3. Nile, Egypt, Africa
4. Tigris-Euphrates, Iraq/ Iran, West Asia
5. Yangtze, China (PRC), Asia
6. Ganges, Bangladesh, Southwest Asia
7. Po, Italy, Europe
8. Mississippi, U.S.A., North America
9. Irrawaddy, Burma, Southern Asia
10. Okovango, Botswana, Africa

Step B

Using the resources that you have available, find the answers to the following questions for one delta:

a. What peoples originally settled there? Give a very brief history of that group.

b. What is the physical geography, climate and average yearly precipitation like?

c. What body of water is the source of your delta's water?

d. What is the region's population? What is the population of the largest nearby city?

e. Is any of the water that passes through your delta a part of water supplies for cities? If yes, is it a groundwater supply or is it imported through aqueducts?

f. What kind of economy does the delta support (industry, farming, fishing)?

g. What species and plant life are a part of the delta's ecosystem?

h. Very important: Identify three major problems in your delta region (for example, a damaged ecosystem, poor water quality, saltwater intrusion).

Step C

If you were the leader of a new World Delta Protection League (not a real name), what would be your plan to help solve some of the common water, farming, environmental and other problems you have identified, in the world's deltas? Write a report about your recommendations.

2. MATH

Compare the size of various delta's and canals around the world. Apply measurements based upon those used in that part of the world.

3. MAPS / CHART

Locate the ten delta regions around the world on a map. Label the map with the names. Locate Bethel Island on a map of California. Locate the Suez Canal on a map. Label Bitter Island on the Suez Canal. Label the two seas that are connected by the Suez Canal. Create and use maps of water around the world identifying adjacent land forms and climate. Graph or chart the types of boats or ships used in the past compared to the present

4. WORLD LANGUAGE

Identify the languages spoken in each Delta Region. Label your map with the language name.

5. SCIENCE

Compare 3 delta regions in the world. Determine the physical geography, climate and average precipitation. Identify the species and plant life in the ecosystems.

6. SOCIAL STUDIES

Identify 5 discoveries, inventions, or innovations in water transportation. Write a paragraph describing how ships pass each other on the Suez canal. Determine what kind of economy that a delta supports. (industry, farming, fishing)? Identify the water transportation channels around the world. What is the historical significance of the Panama Canal?

7. HEALTH / FITNESS

Identify three major health problems related to the water in a delta region.

8. TECHNOLOGY

Describe the technology used in the Panama Canal. Has that technology been used in other Canal's. How has it been improved over time?

9. CREATIVE EXPRESSION

Create a travel brochure for a ship traveling through the Panama Canal, a ferry on a famous canal in the world, or a house boat rental company in a delta region.

10. CAREERS

How many careers can you identify that are associated with canals and deltas? Compare the skills necessary for these careers.

11. COMMUNITY SERVICE

What types of water transportation do you have in your region or state? Can you create a safety poster for one of these companies?

12. REPORT

Identify one canal or delta region and describe the geographic location, physical environment / characteristics, climate, and types of transportation.

13. PRESENTATION

Create a web page of your report that can be shared with other students.

Lesson 5

Water Quality and Chemistry

RESEARCH LOCATIONS / BOOKS

Osmonics - http://www.gewater.com/index.jsp

Water Education Foundation - http://www.water-ed.org/

Water Quality Parameters Chart - http://waterontheweb.org/under/ waterquality/oxygen.html

Water Utility Company

"Experiments with Bubbles" by Robert Garner

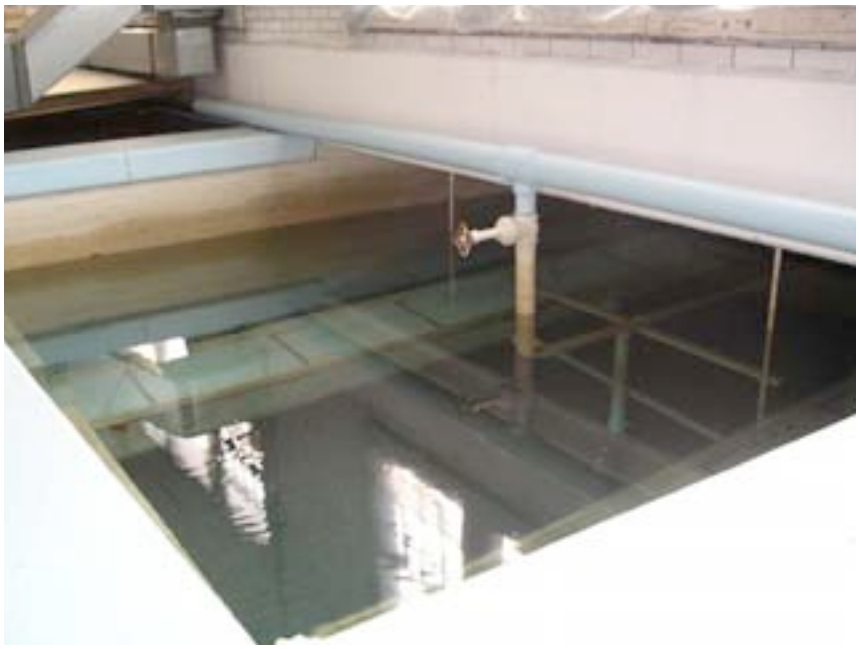
"Great Experiments with H20" by Noel Fearotta

"Acid Rain" by Miller & Berry

1. READING

Read and use vocabulary words in a sentence or one page report.

- Aquifer
- Lagoon
- Protons
- Atomic
- Lake
- Spring
- Calcium
- Natural
- Swim
- Chemical
- Neutrons
- Symbol
- Chemistry
- Nucleus
- Temperature
- Degrees
- Oil spill
- Therapeutic
- Drinking
- Pollution
- Treatment
- Electrons
- Potassium
- Utilities
- Elements
- Potable
- Water supply
- Float
- Pressure
- Dredging
- Periodic table
- Thermal



– Read –

The Nature of Water Quality: Imported and Groundwater

Water can be moved hundreds of miles through an aqueduct or can be part of a watershed system, flowing naturally into a groundwater aquifer. In either case, it is subjected to different kinds of contamination, among them: naturally-occurring organic materials and microorganisms, leaky landfills and underground gas tanks, agricultural and industrial wastewater, cattle and dairy cow waste.

At a water filtration or treatment plant, the technology of water quality science shared with what has been learned from nature's filtering process,

hand, a groundwater aquifer relies on its own ability to filter out water quality problems. Both industrial and agricultural contamination have caused an almost irreversible imbalance in some aquifers' abilities to clean themselves.

Reclaimed water, conservation and desalination, amount others, will certainly be critical parts of any future stories of drinking water supplies. But, it is the success in treatment plants, water quality labs, and the ability of groundwater aquifers to continue to provide safe drinking water that will still be the most important links.

Thus, the treatment plant process -- disinfection (with chlorine), flocculation (using alum), sedimentation, filtration and more disinfection (with chloramine-chlorine and ammonia) in concert with water quality chemistry and microbiology lab tests (hundreds of thousands a year), will maintain the highest standards for imported water.

For groundwater, it is the ability of nature to use the aquifer's layers of gravel, soil, clay sand, and rock to its best water quality advantage. Severe contamination can close a well. If a well is closed, it is a costly and lengthy process to clean it sufficiently to use it again for drinking water. This in turn provides additional demands on uncontaminated aquifers.

It is a critical mixture of nature's skills and the skills of water quality science that will need to remain in "balance" as we enter the water supply and water quality challenges of the future.

Learning Experiences

Build a filter

Materials:

one gallon of dirty water (dirt stirred into tap water) clear funnels or a clear plastic 2 liter soda bottle with the bottom cut out small jars or glasses aluminum sulfate (for particle coagullation-available at drugstores) filtering material (cotton balls, sand, gravel, paper towels, coffee filters, cloth)

Learning Process:

mix about a 1/2 teaspoon of alum into the gallon of dirty water. You should be able to see the dirt patches settle very quickly onto the bottom of the container.

This experience can be done in groups or individually. You will need a jar or glass of dirty water, an empty jar or glass and either a clear funnel or a 2 liter plastic bottle for each learning experience.

Decide which filter materials to use and how to order them as you "build" your filter. Pour about a cup of clean water through the filter and collect the water in the clean jar or glass. Pour your jar of dirty water through your filter into the same jar or glass. If you are working alone - use several filters with different collection jars. Compare the filtered samples to figure out which filter got the water the cleanest.

Discuss with others or write a report about why you think some filters worked better than others. What other variables may have occurred to cause different results.

Go on a field study to your local water district (imported or groundwater).

As a results of the trip:

1. Observe the methods of treatment and filtration used. Ask for a tour of the water quality lab, if they have one on site. Inquire about the cost of treating water and the technology.

2. Ask a water district spokesperson or a water quality chemist / microbiologist to simply explain the most recent annual water quality report.

3. Research Internet sites to locate comparable information in other areas of the country and around the world.

4. Identify various careers involved in water treatment and water quality.

Simulate groundwater overdraft and contamination.

1. By using blue food coloring; a large glass bowl, jar or fish tank; sand, soil typical to your area and pea-size gravel or beads / fish tank rocks, and water, show how a groundwater aquifer fills or charges.

2. Show how water is pumped from an aquifer by using a straw or turkey baster. if enough water is taken out, a large concave depression, indicating subsidence, should form. What impact do you think this has on an aquifer and why is that important?

3. To show how contamination affects an aquifer, recharge or refill your groundwater basin and then add red food coloring. What do you notice? How do you think this relates to real-life aquifers?

2. MATH

Read the water bill at your home. Add the amount that you paid over the last few months or for a year. Determine the average cost per month for your water. Read the quality analysis in the water bill. Compare the cost of maintaining water quality.

3. MAPS/GRAPHS/CHARTS

Construct water graphs, tables, or charts to show quality of water from different sources in your community.

4. WORLD LANGUAGE

Recognize all of the water vocabulary words in another language.

5. SCIENCE

Build 3 water filters and determine which filter gets the water the cleanest. Describe your findings. What are the therapeutic properties of Lake Gyuogy-To in Hungary? Investigate water quality standards in local swimming and boating areas.

6. SOCIAL STUDIES

Make a list of ways you use water at home. Make a list of ways water is used in your city. Identify the quality of water that is necessary in these different locations.

7. HEALTH / FITNESS

Identify sources for clean drinking water. Identify locations of clean water for recreation. Identify locations in the world that have serious water problems. Why do people swim in Lake Gyuogy-To in Hungary? List 3 ways that doctors or hospitals in your community use water

8. TECHNOLOGY

Visit a water utility company in your area and determine how they maintain water quality. What types of technology do they use to measure quality?

9. CREATIVE EXPRESSION

Create a water quality poster for a local beach, swimming pool or water recreation area.

10. CAREERS

How much education is required for a scientist in the water quality industry? How have these careers changed over time?

11. COMMUNITY SERVICE

Analyze water quality and create a water poster, brochure or sign warning about the safety of the water, for drinking, in a particular community location.

12. REPORT

Write a report comparing the quality of water in 3 different locations in the world. How has this affected the populations in that part of the world? Has the quality of water changed over time? What should you do if you travel to these locations?

13. PRESENTATION

Present your water quality information to a tourist or travel agency.

Lesson 6

Water Recreation

RESEARCH LOCATIONS / BOOKS

Waterfront Trust (Lake Ontario) - http://www.waterfronttrail.org/

Visit a "water " recreational area in you community to determine how they use water.

Visit a golf course to understand how they irrigate.

Visit a marina to understand controls of water.

- Resource
- Biologist
- Jetty
- River
- Boat
- Kayak
- Roar
- Buoy
- Lake
- Rocky
- Canoe
- Life guard
- Rushing
- Chlorine
- Man made
- Safety
- Coast Guard
- Marina

1. READING

Read the vocabulary words and use as many as possible in a report about water recreation.

- Beach
- Harbor
- Sanitation
- Crashing
- Mist
- Sail
- Cycle

- Motor
- Shore
- Daredevil
- Pool
- Swimming
- Disinfect
- Population
- Utilities
- Dock
- Port
- Soak
- Dive
- Power
- Starboard
- Falls
- Pressure
- Stunt
- Fishing
- Purification
- Tackle
- Gallon
- Recreation
- Whirlpool
- Gear
- Relax
- White water

2. MATH

Compare length, weight, volume, area and temperature of recreational areas, swimming pools, and ocean beaches.

3. MAPS / CHART

Chart the differences between need for drinking water and water recreation. Identify major water recreational areas on a world map.

4. WORLD LANGUAGE

Make signs for water recreation areas in two or more languages.

5. SCIENCE

Identify the chemicals and purification equipment used to clean water recreational areas.

6. SOCIAL STUDIES

Identify the laws that pertain to recreational use of water. Are the laws different for boats on water compared to cars on land? Who enforces these rules or laws? Identify the recreational aspects of Niagara Falls. Compare Niagara Falls with other large water recreational areas. What is the World Cup and where does it take place? Who is involved? Where and how have cities used Aquariums to increase tourism. Can you compare 3 major Aquariums in the world?

7. HEALTH / FITNESS

Make a list of water safety rules at a beach, marina or swimming pool. Demonstrate knowledge of CPR. Identify the water sports that improve fitness?

8. TECHNOLOGY

How do water recreation areas use technology to protect individuals?

9. CREATIVE EXPRESSION

Create a poster for a beach, boat harbor or swimming pool event in the community.

10. CAREERS

Investigate careers in water recreation. What duties do the Coast Guard and Life Guards share? Identify the skills necessary for these careers.

11. COMMUNITY SERVICE

Learn how to swim or take a lifeguard course. Volunteer to supervise children in a water recreation area.

12. REPORT

Describe, in detail, a water recreation area in your community or state. Include quality of water, types of usage, rules and regulations, cost, and other important information.

13. PRESENTATION

Share your report with the officials at the recreation area

Lesson 7

Port Cities

RESEARCH LOCATIONS / BOOKS

Ocean Institute - Ocean Education Center - http:// www.ocean-institute.org/

1. READING

Read about ports and identify the vocabulary words that you can find in these articles or books.

- Aquaculture
- Ice age
- Salmon
- Arctic circle
- Industry
- Sardine
- Canning
- Lobster
- Sea level
- Coastline
- Mackerel
- Seawater
- Desalination
- Marine
- Ship building
- Distillation
- Ocean
- Tanker
- Diver
- Oceanography
- Trade
- Economy
- Oil
- Viking
- Evaporation
- Petroleum
- Waterfront
- Filter
- Potable
- Soak
- Fjord
- Production
- Water supply
- Fish market

- Resource
- Waterways
- Harbor
- Reverse osmosis
- Wave

– Read –

Seawater Desalination: Fresh Water for the Future?

Desalination, the process of making fresh water out of salt water by removing fresh water from sea water or "desalting" the ocean water, has been around for centuries. Throughout the world today, and in states like California and Florida, the use of desalination as a real source of water varies tremendously.

In the Middle East, an oil-rich, but water-poor country like Saudi Arabia, just rely on desalination for virtually all of its water supply. It is much more fortunate than water-poor and dollar poor countries who can't afford to install the technology. In fact, the Middle East accounts for more than 70 percent of the world's seawater desalting production.

In contrast, the United States with more than 5,700 miles of coastline, has only four existing seawater desalination plants for use in cities. Three are in California: Morro Bay, Santa Barbara and Santa Catalina Island. The fourth is in Key West, Florida. Not all of these plants are even running daily, most are on standby, ready for the next drought.

Why do you think there are so few plants in the United States? The quickest answer is that our water supply, whether imported or groundwater, is much more plentiful. One of the least obvious, but most

realistic answers if that the cost of "desalting' water is still way too high.

An acre-foot of treated drinking water (about 3267,000 gallons of water - enough for two small families in and around the home for one year) cost about $450. The cost for an acre-foot of desalted drinking water is anywhere from between $1,000 and $2,000. Yet, population increases, water quality and environments issues make it clear that desalination must be a part of any long-term water resource planning. Some water engineers estimate that over the next few years, desalinized water costs could be brought "down' to about $710 an acre-foot. This would at least make it a more practical option as an additional water source.

There are two ways or "technologies" to desalinize seawater: distillation and reverse osmosis. Distillation uses heat to evaporate seawater. Middle East plants use the distillation process. Reverse osmosis removes about 99 percent of the salt by forcing seawater through filter membranes at very high pressure, thus "filtering out" the salt, leaving fresh water. The four plants in the United States use reverse osmosis.

Learning Experiences

1. For this experiment, you will need the following materials - small aquarium or large clear tub (like Tupperware or Rubbermaid), tap water, table salt, 3 glasses or jars (like Jelly jars), clear plastic wrap, plastic / masking tape, a small stone.

To prepare for your experiment you need to create "saltwater." Add 3 grams of table salt per quart of tap water to come as close to "seawater" as possible. (seawater contains about 3.3 percent salt.)

With no other directions and using the materials listed above, your task is to build a "solar still." To build a successful still, you must use your materials effectively to produce a "desalted" water, much less salty than your original "seawater."

To be able to verify that your still does "desalt," test the pH of the "seawater" before and the desalinated" water after.

Hint: In setting up this experiment, remember how the distillation process resembles nature's water cycle.

2. Research the number of desalination plants operating throughout the world. How much water are they producing? What is the cost per acre-foot?

3. Try to locate a diagram of the two "desalting' processes: distillation and reverse osmosis. Ho many gallons of water are needed to operate either type of plant as efficiently as possible?

4. Identify any environmental concerns in operating either type of plant? Can these problems be solved?

5. Gather quotes and opinions from experts in varying water-related fields about how soon and what percentage of the water supply in states like California will come from desalination plants. Include responses from your local water agency.

2. MATH

Create a mathematical comparison of water and uses in port cities Examples: size of harbor, shipping, imports, clean up efforts channel dredging, marinas, fishing industry, recreation.

3. MAPS / CHART

Create a map of Norway and identify the major cities located on large bodies of water. Locate Oslo, Bergen, and Stavanger on your map of Norway. Create a map of the U.S. and identify the major cities located near large bodies of water. Locate Dana Point, Long Beach and Oakland in California. Locate Seattle, San Diego, Boston and Miami on your map. Identify the bodies of water connecting the U.S. and Norway..

4. WORLD LANGUAGE

Label the bodies of water in the world in the language spoken in that part of the world.

5. SCIENCE

Identify the scientific concerns of water quality in a Port City including the chemicals, waste management and environmental issues that could affect the quality of water.

6. SOCIAL STUDIES

Write a description about how communities use water today: Examples: drinking, transportation, irrigation, power, and recreation. Determine how water quality affects the economy in a port city. Identify a port city and describe the items that are imported or exported.

7. HEALTH / FITNESS

Identify 5 health concerns in a port city and determine how these are controlled.

8. TECHNOLOGY

What types of technologies are used today to protect ships and ports?

9. CREATIVE EXPRESSION

Identify the location of the Monolith sculpture. Describe this park in detail. Where is the "Little Mermaid" located? What other port cities have famous works of art?

10. CAREERS

Identify and compare the careers on a cruise ship and a cargo ship. Do these careers change in relation to the ports they serve?

11. COMMUNITY SERVICE

Make a list of the community service options in a port city. What do tourists or crew members need when they come ashore?

12. REPORT

Write a report, describing in detail, an international port and city. What is the global benefit of this port?

13. PRESENTATION

Send your report to the Chamber of Commerce of that port city. Request a response on the accuracy of your investigations. Provide a method for them to respond.

Lesson 8

Powerful Water

RESEARCH LOCATIONS / BOOKS

http://www.weatherchannel.com

Go to a farm or land development area and view erosion.

Read books and newspaper articles about hurricanes and storms.

Read the weather report in the newspaper.

Read about problems associated with erosion.

1. READING

Recognize, sound, and write the water vocabulary words.

- Beach
- Extreme
- Rain
- Breakwater
- Flood
- Reef
- Catastrophic
- Geyser
- Replenish
- Cloud
- Glacier
- River
- Crops
- Groundwater
- Restoration
- Cyclone
- Hurricane
- Retention
- Degraded
- Jetty
- Runoff
- Drought
- Low Pressure
- Snow
- Environmental
- Migrate
- Storm
- Erosion
- Minimal
- Stream
- Essential
- Moderate
- Thunder
- Extensive
- National Weather Service
- Tidal Wave
- Evaporate
- Pressure
- Wind

– Read –

Beach Erosion

Beach erosion is a concern of many communities. There are different existing conditions in each location. Some communities build breakwaters, jetties or rock groins. Others wish to keep the natural environment intact and find other alternatives for replenishing and retaining beach sand. Federal agencies are concerned and can provide help but they do not try to force communities to accept their recommendations if the community does not want them. Sand replenishment and minimizing beach erosion is a continuing concern in San Clemente, California. They have formed the San Clemente Shoreline Feasibility Study to work with the Army Corps of

Engineers to solve their erosion problems.

It has been determined that at the beach in San Clemente the railroad rocks are placed haphazardly. Some feel that a better-designed railroad revetment could minimize the seawall's contribution to beach erosion. Some people want to consider removing the railroad tracks or tunneling them under the freeway. Others are concerned about the time it would take for that solution.

San Clemente citizens have determined that they do not wish to build sand retention structures. A few citizens want to include a study of ways to restore degraded San Juan Creek. Others want to carefully consider the impact of beach replenishment on surfing and individual surf spots. One person has urged caution to make sure that sand dumped on the beach does not migrate offshore, covering beds of sea grass or rocky reefs. All of these ideas could be considered when beach communities make important decisions about erosion.

The Army Corps of Engineers will investigate current conditions and what may happen to the beach if nothing is done. They will evaluate alternatives, do a cost-benefit analysis and prepare and environmental impact study. Once the study is complete, the Army Corps can ask Congress to fund a beach restoration project. The City could decide that they prefer a different alternative and this could be more costly. In this case the city would have to pay the difference.

This is just one example of how a community is studying ways to prevent beach erosion. Does your community have an erosion problem at a beach, near a river, on a farm, or in a housing development?

2. MATH

Calculate the various costs of erosion. Analyze the percent of topsoil has eroded in the U.S. and the world.

3. MAPS / CHART

Compare the winds in Category 1 - 5 hurricanes. Make a chart of the hurricane wind speeds. How do these speeds compare to the winds in a tornado?

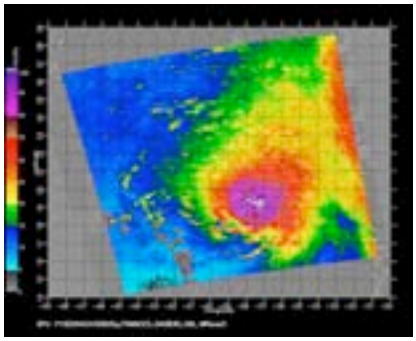
4. WORLD LANGUAGE

Label a weather map in another language.

- Rain
- Storm
- Wind
- Snow
- Clouds
- Sun

5. SCIENCE

List five facts about hurricanes. Describe six causes of erosion. Can you identify a recent erosion disaster? What was the cause of this erosion?



6. SOCIAL STUDIES

Write a paragraph about the erosion problems in communities or farms. How has a Tsunami affected a community? Can you identify other water disasters and their locations in the world?

7. HEALTH / FITNESS

Make a safety chart about things to do before a storm and what you should do if you are caught in a storm.

8. TECHNOLOGY

Watch the Weather Channel on TV. Identify the states / countries that will be having storms during the next week. What are they doing to prepare?

9. CREATIVE EXPRESSION

Create a "stormy day" painting or poem.

10. CAREERS

Describe the difference between the career and skills of a weather reporter and a meteorologist on a news program.

11. COMMUNITY SERVICE

What could you do if your community was facing a water emergency or disaster?

12. REPORT

Write a summary of a recent water related disaster and how the residents, with help from others, restored the area.

13. PRESENTATION

Present your information in your school or a community newspaper.

Lesson 9

Hydroelectric Power

RESEARCH LOCATIONS / BOOKS

Tennesse Valley Authority - Hydroelectric Power - http:/ /www.tva.gov/power/ hydro.htm

Hydroelectric Power: How it works - http://ga.water.usgs.gov/edu/hyhowworks.html

Visit a dam, hydroelectric power plant or a storm disaster area.

If these are not available in your community click on this web site.

Read books about Hydroelectric Power and Dams

1. READING

Read, write, and use the vocabulary words in a sentence, paragraph or report.

- Cleaning
- Generator
- Reservoirs
- Conserve
- Hydroelectric

- River
- Convert
- Importing
- Storage
- Cooking
- Natural
- Supplies
- Crops
- Nutrient
- Technology
- Dam
- Population
- Turbine
- Downstream
- Power
- Stream
- Drinking
- Powerful
- Use
- Essential
- Produce
- Water
- Evaporate
- Renewable
- Wheel

2. MATH

Compare the amount of hydroelectric power generated in 3 different countries. Which country is most dependent on this type of power and how does the cost compare with other sources of energy?

3. MAPS / CHART

Locate dams and hydroelectric plants on a map. List the cities and countries that use hydroelectric power.

4. WORLD LANGUAGE

Speak and write vocabulary words in another language.

5. SCIENCE

Write a paragraph describing how a hydroelectric power plant works. Build a model of a hydroelectric plant.

6. SOCIAL STUDIES

Describe the importance of electricity in a city and how hydroelectric power provides that electricity. Can you identify a major river in the world that may be dammed to generate hydroelectric power? What is the opinion of the residents in the area?

7. HEALTH / FITNESS

Describe the health problems when the demand for water exceeds the supply.

8. TECHNOLOGY

Describe the technology used in a hydroelectric power plant.

9. CREATIVE EXPRESSION

Investigate works or art that portray hydroelectric power.

10. CAREERS

Investigate and identify geographic locations for careers in the hydroelectric power industry. Write a letter to the human resources director of a hydroelectric power plant asking for job information.

11. COMMUNITY SERVICE

What types of community service would you find near a hydroelectric power plant?

12. REPORT

Compare the use of hydroelectric power in the United States and another country. Use data to support the positive or negative aspects of this source of power.

13. PRESENTATION

Present your report to a scientist in a local energy company to verify your research. Modify your report based upon his response to your information.

Lesson 10

Conservation

RESEARCH LOCATIONS / BOOKS

Soil and Water Conservation Society - http: //www.swcs.org/

WaterWiser - http://www.awwa.org/waterwiser/

Take a trip to a local water utility and investigate ways to conserve water.

1. READING

Read the vocabulary words and add ten words to the list based upon your research.

- Agencies
- Import
- Storage
- Conservation
- Population
- Supply
- Desalination
- Reclamation
- Water
- Expand
- Xeriscape
- Groundwater

Read: water conservation ideas in your water bill.

Read: Spill, The Story of the Exxon Valdez by Terry Carr.

Read: Oil Spill by Melvin Berger.

– Read –

Water Conservation: Thinking More About Using Less

In the morning, we are fortunate to have water with which we can take a shower, brush our teeth, and boil to make hot chocolate or instant oatmeal. It is very easy to take water for granted. what would your day be like without it? Think about it - a day with no water in the restrooms, none for swimming practice, nor any in the drinking fountains or in the sinks of your science classes for experiments, not even in the hose you use to wash a car. You get the idea.

Sometimes, snow-covered mountain ranges are not enough. The fact is that each day millions of people rely on using water in a variety of ways to live and work. All indications are that those numbers will continue to increase.

The world's population of 5.9 billion is likely to double in the next 50 - 90 years. How does that affect you? In twenty-five years it is possible that there will be 3 billion more people in the world, many million more will be in the United States. You will be in the prime of your life; won't that impact the environment in which you live?

Do the math: Unless out state, nation or world can figure out ways to expand water supplies, the demand (how much water is used) will far exceed the supply (the amount of drinking water that can be provided). There are options for identifying future water supplies - but they all have disadvantages as well as advantages: importing more water from areas of supply to areas of need; making greater use of groundwater supplies;

developing more water reclamation plants; building additional storage reservoirs; and finally, creating desalination plants.

Despite all of the above options, you will be the most important part of the solution. Your ability to work with others to conserve water and continue to use it wisely, now and throughout your lives, will help water agencies go a long way toward meeting future demand. Conservation alone won't do it, but none of the other options can succeed without it.

Therefore, all of us must work hard to understand that we have an obligation or duty to figure out how to make the supplies of water last. We need to learn to be much more efficient in how we use water.

By becoming better "stewards" or caretakers of how we each use water, we can learn to conserve, recycle and help stretch the supply of water and help to maintain the "balance" between both human and environmental needs that is so important.

2. MATH

Create a mathematical analysis of one aspect of water over time. This could be analyzing the cost of building a hydroelectric power plant, a dam, or a transportation canal. It could be the cost of building a water purification system for a city or a clean up of a water environmental disaster in a harbor or on a beach. Compare the costs of providing water with the need to conserve water.

3. MAPS / CHART

Chart the various uses for water today. Chart the ways that people can conserve water.

4. WORLD LANGUAGE

Write water conservation words in 5 languages.

5. SCIENCE

List plants that are used in xeriscaping. Identify areas in the world that should conserve water used for landscaping or irrigation.

6. SOCIAL STUDIES

Conduct a survey and record results. Ways you use water at home. Ways you use water at school. Ways you use water in the community. Identify the five unwise uses of water in all locations. Identify conservation ideas for each item

7. HEALTH / FITNESS

Determine the human needs for water and ways that water can be conserved in a health emergency.

8. TECHNOLOGY

How is technology used today to help you conserve water in your home? Are there incentives for people to install water conservation systems, tools or appliances?

9. CREATIVE EXPRESSION

Make a water conservation poster or brochure using tag lines with words in 5 languages.

10. CAREERS

Identify the careers associated with water conservation in the home and community. How important will these careers be in the future?

11. COMMUNITY SERVICE

Work with your school or family to identify a plan to conserve water. Keep a chart of water use to determine success of your plan.

12. REPORT

Write a report comparing water to other natural resources in the world. Identify why water is a primary resource for civilization in the future.

13. PRESENTATION

Present your report to a representative from a water utility company in your community.

Primary Content

P1 READ TO UNDERSTAND ABOUT WATER

1. Recognize, sound, spell and write the water vocabulary words.

2. Identify correct meaning of words .

3. Write water words in sentences.

4. Identify main idea, important elements and sequence of events in water stories and articles.

P2 CONDUCT A MATHEMATICAL ANALYSIS OF WATER

1. Use numbers to count, and identify water information.

2. Use math to measure a body of water.

3. Use math to compare water information or solve a problem.

4. Understand money amounts and the cost of water.

P3 CREATE MAPS, GRAPHS AND CHARTS ABOUT WATER

1. Read and interpret water maps, tables, graphs and charts.

2. Construct water graphs, tables, and charts from given information.

3. Create a map of a body of water.

4. Analyze information presented in water maps and graphs.

P4 COMMUNICATE WATER INFORMATION IN ANOTHER LANGUAGE

1. Recognize a few water vocabulary words in another language.

2. Recognize all of the water vocabulary words in another language.

3. Speak and write vocabulary words in one other language.

4. Label water pictures and charts using words in another language.

P5 CONDUCT A SCIENTIFIC RESEARCH ABOUT WATER

1. Generate reasonable explanations of water quality.

2. Use scientific method to determine water pollution.

3. Interpret data about a local body of water.

4. Investigate water quality and varied uses.

P6 CONDUCT A SOCIAL STUDIES INVESTIGATION ABOUT WATER

1. Identify and exhibit good citizenship and water conservation.

2. Identify and explain historical water events.

3. Identify different sources of drinking water and how they are sold.

4. Evaluate discoveries, inventions, and innovations in water transportation.

P7 INVESTIGATE THE HEALTH ISSUES RELATED TO WATER

1. Understand the human and animal need for water.

2. Identify sources for clean water.

3. Understand water sources that are not safe to drink.

4. Establish a day long / life long health plan using water.

P8. UNDERSTAND THE TECHNOLOGY APPLICATIONS WITH WATER

1. Learn how water is measured using technology.

2. Understand the purpose for a variety of technology tools to analyze water.

3. Analyze your water information using a technology tools.

4. Record your water information using computers, the Internet, and digital equipment.

P9 PRODUCE A CREATIVE EXPRESSION ABOUT WATER THROUGH ART, MUSIC OR DRAMA

1. Research various water creative expressions such as art, music, dance, and drama.

2. Analyze, interpret or create a water picture, poster or mural.

3. Perform music or sing songs about water.

4. Present an original water related work of art to an audience or in an exhibit.

P10 INVESTIGATE CAREERS ASSOCIATED WITH WATER

1. Identify the multiple careers associated with water.

2. Investigate changes in water careers over time.

3. Determine skills necessary for each career.

4. Summarize one water related career that is interesting.

P11 COMPLETE A WATER RELATED COMMUNITY SERVICE

1. Demonstrate understanding for the need for community service.

2. Identify ways that people can conserve or preserve water.

3. Determine various water service options in your community.

4. Complete a water service project.

P12 WRITE A REPORT ABOUT WATER

1. Create a water dictionary with definitions.

2. Present water information in a paragraph or report.

3. Include accurate information and the most important ideas in your research.

4. Use complete sentences, correct spelling, correct punctuation, appropriate capitalization.

P13 MAKE A WATER PRESENTATION FOR A JURY USING MULTI MEDIA TOOLS

1. Organize a water presentation for an audience.

2. Develop charts or materials to portray information.

3. Deliver presentation smoothly without notes.

4. Use appropriate vocal inflections and verbal expressions.

Intermediate Content

P1 READ TO UNDERSTAND ABOUT WATER

1. Read myths, legends, literature, informative articles, and biographies about water.

2. Read from dictionaries, encyclopedias, atlases, newspapers, periodicals, reports, resource books, annual reports and the Internet to gather specific water information.

3. Identify details and specific information about water.

4. Summarize, compare, contrast and draw conclusions from water facts.

P2 CONDUCT A MATHEMATICAL ANALYSIS OF WATER

1. Understand and use fractions and decimals to solve water problems.

2. Measure length, weight, volume, area and temperature of bodies of water.

3. Use mathematics to solve complex water problems.

4. Calculate costs associated with water and water usage.

P3 CREATE MAPS, GRAPHS AND CHARTS ABOUT WATER

1. Explore water issues using maps, graphs and charts.

2. Recognize conflicting messages conveyed through graphical representations.

3. Use graphics to present comparative information, interpretations, and analyses of water.

4. Use maps to locate specific places on or near bodies of water.

P4 COMMUNICATE WATER INFORMATION IN ANOTHER LANGUAGE

1. Follow simple directions in another language.

2. Recognize water vocabulary words in two or more languages.

3. Construct sentences and write water reports in another language.

4. Speak and write vocabulary words in two or more languages.

P5 CONDUCT A SCIENTIFIC RESEARCH ABOUT WATER

1. Solve a range of water related problems using a variety of strategies and procedures.

2. Use tools and technology to obtain up to date information about water issues.

3. Understand the importance of water in energy production.

4. Survey a defined area of water and interpret its macro-ecological surrounding.

P6 CONDUCT A SOCIAL STUDIES INVESTIGATION ABOUT WATER

1. Understand the importance of water in communities and transportation.

2. Identify the laws that pertain to recreational use of water.

3. Determine how news sources report fact and opinion about water.

4. Identify multiple historical reasons that a city was located near a body of water.

P7 INVESTIGATE THE HEALTH ISSUES RELATED TO WATER

1. Identify health problems and disease related to impure water.

2. Understand the need for water in preventative health care.

3. Identify water safety rules for swimming and boating.

4. Identify locations in the world that have serious water problems.

P8. UNDERSTAND THE TECHNOLOGY APPLICATIONS WITH WATER

1. Identify appropriate communication tools for accessing up to date water information.

2. Find water information on the efg world wide web site.

3. Present water information using multi media tools and world wide web applications.

4. Research water issues by asking questions of others using communication tools.

P9 PRODUCE A CREATIVE EXPRESSION ABOUT WATER THROUGH ART, MUSIC OR DRAMA

1. Use creative expression to convey multiple and divergent perspectives of the water.

2. Research the historical perspective on a particular work of art that features water.

3. Review, create or perform a musical work that represents water.

4. Create a photo album of water in your area.

P10 INVESTIGATE CAREERS ASSOCIATED WITH WATER

1. Identify education necessary to obtain the skills for a water related career.

2. Interview or "job shadow" various people in different water careers.

3. Investigate geographic location for specific water careers.

4. Research economic benefits from various careers.

P11 COMPLETE A WATER RELATED COMMUNITY SERVICE

1. Identify a volunteer opportunity or a service in the community.

2. Develop goals for the service and a timeline to complete the assistance.

3. Complete a service of short duration associated with the water project.

4. Analyze the value of the service that was provided.

P12 WRITE A REPORT ABOUT WATER

1. Organize water information, explanations and supporting details.

2. Write unified and well-formed paragraphs which develop specific water information.

3. Write a report using notes, interviews, pertinent data and multiple sources of water information.

4. Use transitions from one subtopic to the next.

P13 MAKE A WATER PRESENTATION FOR A JURY USING MULTI MEDIA TOOLS

1. Create a chart, exhibition or Power Point presentation about the water study.

2. Demonstrate clear connections to the oral presentation.

3. Include one or more areas of emphasis and all important information.

4. Respond to questions from the audience.

Advanced Content

P1 READ TO UNDERSTAND ABOUT WATER

1. Read about key water issues around the world.

2. Analyze motive, point of view, conflicts and solutions related to water issues.

3. Determine which ideas are accurate and complete. Distinguish fact from opinion.

4. Answer Project questions in a manner that is plausible, logical, clear and well-supported.

P2 CONDUCT A MATHEMATICAL ANALYSIS OF WATER

1. Using mathematics compare the quality and quantity of a container or body of water.

2. Calculate the cost of water for a household or community.

3. Analyze the contributing factors to that cost.

4. Compare the cost of water between different communities, states or countries.

P3 CREATE MAPS, GRAPHS AND CHARTS ABOUT WATER

1. Create and use maps of water around the world identifying adjacent land forms and climate.

2. Identify the bodies of water connecting the U.S. and other countries.

3. Graph or chart the types of boats or ships used in the past compared to the present.

4. Use graphs and charts to communicate mathematical interpretations.

P4 COMMUNICATE WATER INFORMATION IN ANOTHER LANGUAGE

1. Answer water questions in another language.

2. Access world wide water information by communicating with a person in another language.

3. Label the bodies of water in the world in another language.

4. Write a summary of your water presentation in another language.

P5 CONDUCT A SCIENTIFIC RESEARCH ABOUT WATER

1. Describe a water related plant or animal in detail and highlight its value to the living systems.

2. Demonstrate an understanding of water and energy production.

3. Research a water pollution disaster and the

effects on plants, animals and people.

4. Understand the relation of human needs and the resultant effects on the ecosystem.

P6 CONDUCT A SOCIAL STUDIES INVESTIGATION ABOUT WATER

1. Demonstrate knowledge of local, state, national and world laws governing water.

2. Analyze water use for irrigation of golf courses, public places, gardens and farms.

3. Identify the water transportation channels around the world.

4. Demonstrate knowledge of global interdependence by creating a 5 year analysis of bottled water.

P7 INVESTIGATE THE HEALTH ISSUES RELATED TO WATER

1. Investigate water quality standards in local swimming and boating areas.

2. Demonstrate knowledge of CPR.

3. Describe how health care agencies in a community use water.

4. Investigate the latest in technology advances to improve water quality by your water district.

P8. UNDERSTAND THE TECHNOLOGY APPLICATIONS WITH WATER

1. Produce effective and accurate multi media presentations about your water research.

2. Create a CD ROM, Power Point presentation or world wide web site of your water project.

3. Evaluate two or more technology tools used to obtain or purify water.

4. Present a plan for desalinating water.

P9 PRODUCE A CREATIVE EXPRESSION ABOUT WATER THROUGH ART, MUSIC OR DRAMA

1. Categorize water paintings by famous artists.

2. Compile an historical timeline of water songs.

3. Create a logo or brochure for a water product or company.

4. Analyze the filming of water in a movie involving a river or ocean.

P10 INVESTIGATE CAREERS ASSOCIATED WITH WATER

1. Create an advertisement for employees for a local water company.

2. Create a logo or brochure for a water company.

3. Compile a personal resume of your employability skills.

4. Investigate quality tools and personal responsibility necessary for particular careers.

P11 COMPLETE A WATER RELATED COMMUNITY SERVICE

1. Complete a service project on a lake, pond, stream or beach.

2. List the results and identify the persons or locations that have benefited from the work.

3. Create and distribute an evaluation form for a person or organization to complete.

4. Develop a service plan for maintaining the area in the future.

P12 WRITE A REPORT ABOUT WATER

1. Use the complete and accurate form required for the task (e.g., title page and bibliography).

2. Use illustrations, graphs and charts to complement and explain the ideas in the text.

3. Use headings and subheading to represent the appropriate levels of organization and describe the water information adequately and accurately.

4. Produce an attractive, neat and easily read report that conveys all aspects of the water project.

P13 MAKE A WATER PRESENTATION FOR A JURY USING MULTI MEDIA TOOLS

1. Make a water presentation using appropriate technology and multi media tools.

2. Exclude extraneous details.

3. Respond appropriately to questions from the jury or audience.

4. Modify water presentation to reflect audience questions and interest.

Expert Content

P1 READ TO UNDERSTAND ABOUT WATER

1. Read multiple sources of information, such as books, reports, newspapers and the Internet, about the past, present and future of water bodies, sources, consumption, quality and uses.

P2 CONDUCT A MATHEMATICAL ANALYSIS OF WATER

1. Create a mathematical analysis of one aspect of water over time. This could be analyzing the cost of building a hydroelectric power plant, a dam, or a transportation canal. It could be the cost of building a water purification system for a city or a clean up of a water environmental disaster in a harbor or on a beach.

P3 CREATE MAPS, GRAPHS AND CHARTS ABOUT WATER

1. Demonstrate knowledge of the major bodies of water in the world by drawing on a blank globe or creating a 3 dimensional world model or diorama.

P4 COMMUNICATE WATER INFORMATION IN ANOTHER LANGUAGE

1. Interview someone from another country, in their language, and record their response to water related questions.

P5 CONDUCT A SCIENTIFIC RESEARCH ABOUT WATER

1. Survey a defined area of water and interpret the quality, type and cause of pollution and its macro-ecological surrounding including a detailed description of the plants and animals.

P6 CONDUCT A SOCIAL STUDIES INVESTIGATION ABOUT WATER

1. Conduct an economic examination of the water use of a business, city, state or region over a 7 - 10 year time frame and identify the quality of water that is available for the inhabitants.

P7 INVESTIGATE THE HEALTH ISSUES RELATED TO WATER

1. Create a poster about the need for pure water the daily lives of all people.

P8. UNDERSTAND THE TECHNOLOGY APPLICATIONS WITH WATER

1. Analyze three water technologies that have evolved over time.

P9 PRODUCE A CREATIVE EXPRESSION ABOUT WATER THROUGH ART, MUSIC OR DRAMA

1. Create a work of art featuring one aspect of water.

P10 INVESTIGATE CAREERS ASSOCIATED WITH WATER

1. Analyze 3 separate careers in a water or water related industry and compare skills, educational requirements, economic benefits, and geographic locales.

P11 COMPLETE A WATER RELATED COMMUNITY SERVICE

1. Organize a clean up of a water area in your community. Create advertising for the event, coordinate the service project, identify number of participants and report results.

P12 WRITE A REPORT ABOUT WATER

1. Write a complete water report, with chapters describing research in each portfolio category.

P13 MAKE A WATER PRESENTATION FOR A JURY USING MULTI MEDIA TOOLS

1. Present the water project to a real or digital audience providing an opportunity for questions and responding with accurate answers.

efgStandards

WATER H²O

efgProject™ Portfolio

This Chapter provides the content standards that can be applied to the "Water H²O" Project to insure that students are learning necessary skills to increase achievement on standardized tests.

CONTINUOUS LEARNING RUBRICS IN 13 CONTENT AREAS

P1.00 READING

Read up to date, real world information to understand the "Water" Project.

P1.01

Recognize, sound, spell and write "Water" Project words.

P1.02

Identify correct meaning of words and sentences.

P1.03

Read myths, legends, literature, informative articles, biographies, autobiographies, historical fiction, dramas, and folk tales appropriate for the "Water" Project.

P1.04

Read from dictionaries, encyclopedias, atlases, newspapers, periodicals, reports, resource books, annual reports and the Internet to gather specific "Water" Project information.

P1.05

Identify main idea, important elements and sequence of events in books and documents.

P1.06

Identify details and describe setting and characters.

P1.07

Identify primary relationships such as cause and effect.

P1.08

Summarize, compare and contrast items and draw conclusions from given facts.

P1.09

Analyze motive, mood, point of view, conflicts and solutions.

P1.10

Determine which ideas are accurate and complete. Distinguish "Water" fact from opinion.

P1.11

Answer Project questions in a manner that is plausible, logical, clear and well-supported by evidence from the reading.

P1.12

Make connections to other works written by the same author, reporter, scientist or military expert.

P2.00 MATH

Conduct real world math applications for each "Water" Lesson.

P2.01

Use numbers to count, and identify location.

P2.02

Perform mathematical procedures efficiently, accurately, and completely.

P2.03

Use whole numbers to add, subtract, multiply and divide.

P2.04

Understand and use fractions and decimals to understand "Water" Project information.

P2.05

Understand money amounts and value throughout "Water".

P2.06

Measure length, weight, volume, area and temperature.

P2.07

Use mathematics to solve complex "Water" problems.

P2.08

Represent mathematical findings, data, and relationships in reasonable and effective ways.

P2.09

Use tools appropriately to understand and communicate mathematical ideas and solutions.

P2.10

Solve a range of "Water" problems, indexed by complexity, using real-world and theoretical information and a wide range of procedures or strategies.

P2.11

Analyze, draw conclusions, and make mathematical generalizations about the "Water" Project.

P2.12

Connect mathematical solutions to the original "Water" Project and extend to "next step" investigations.

P4.00 MAPS/GRAPHS/ CHARTS

Create geographic and graphical representation of "Water" Project details.

P3.01

Read and interpret tables, graphs and charts.

P3.02

Construct graphs, tables, charts and grids from given information.

P3.03

Analyze information and solve problems presented in graphic representation.

P3.04

Explore "Water" ideas, issues, and relationships through graphics.

P3.05

Recognize conflicting information conveyed through graphical representation.

P3.06

Make judgments about the appropriate use of graphs and charts to represent information.

P3.07

Find specific "Water" Project locations on a local, state, national and world map.

P3.08

Use maps to understand historical and current events and to research "Water" issues.

P3.09

Use and create road, product, resource, coast lines, climate, population, and political maps.

P3.10

Identify geographic connections between the U.S. and other countries.

P3.11

Demonstrate knowledge of "Water" by drawing on a blank globe, creating a graph or chart, or building a 3 dimensional model or diorama.

P3.12

Make Project information explicit by using maps and graphics to highlight "Water" ideas and interpretations.

P4.00 WORLD LANGUAGE

Understand and communicate "Water" Project information in another language.

P4.01

Recognize a few "Water" Project vocabulary words in another language.

P4.02

Recognize all of the "Water" Project vocabulary words in another language.

P4.03

Speak and write vocabulary words in one other language.

P4.04

Follow simple directions in the language.

P4.05

Construct sentences and write reports in another language.

P4.06

Recognize all of the "Water" Project vocabulary words in two or more languages.

P4.07

Speak and write vocabulary words in two or more languages.

P4.08

Construct sentences and write reports in two or more languages.

P4.09

Understand implications, can draw appropriate inferences and answer questions in the language.

P4.10

Access information and communicate in person or on the internet in other languages.

P4.11

Complete the entire "Water" project and portfolio of work in another language.

P4.12

Demonstrate understanding of project words in 5-10 other languages.

P5.00 SCIENCE

Apply scientific research to the "Water' Project.

P5.01

Generate reasonable explanations of scientific ideas.

P5.02

Use scientific models to make sense of the "Water" Project information.

P5.03

Interpret data and formulate hypotheses that are testable.

P5.04

Create justification appropriate to scientific research.

P5.05

Solve a range of science problems using a variety of strategies and procedures.

P5.06

Use tools and technology to obtain up to date information and communicate ideas about the "Water" Project.

P5.07

Display a depth of understanding of important science content and ideas.

P5.08

Demonstrate the ability to survey a defined area of water biologically, chemically and physically, and interpret its macro-ecological surrounding.

P5.09

Describe a water plant or animal in detail and highlight its value to the living systems.

P5.10

Demonstrate an understanding of water in relation to energy.

P5.11

Demonstrate knowledge of pollution of water with results presented in separate scenarios for soil, plants, and animals.

P5.12

Understand the relation of human needs in the "Water" Project and the resultant effects on the ecosystem.

P6.00 SOCIAL STUDIES

Apply social studies concepts to the "Water" Project.

P6.01

Identify and exhibit good citizenship, responsibility, and cooperation while working on the "Water" Project.

P6.02

Identify and explain historical events associated with "Water".

P6.03

Explain "Water" Project goods and services and how they are produced, advertised, and obtained.

P6.04

Evaluate the influence of discoveries, inventions, and innovations on the "Water" Project.

P6.05

Understand the historical settlements of families, villages or cities near water sources.

P6.06

Identify the laws that pertain to people and the "Water" Project.

P6.07

Determine how news sources reflect fact and opinion about the water.

P6.08

Conduct an economic examination of a community and identify how water resources are used to meet the needs of people.

P6.09

Demonstrate knowledge of local, state, national or world governments their affect on water resources.

P6.10

Understand the relationship between the past, present and future by thoroughly examining a water issue, current event, or resource.

P6.11

Demonstrate knowledge of global interdependence by creating a 5 year global analysis of the needs and availability of water.

P6.12

Create a 10 year plan that identifies personal, physical, educational, occupational, and economic issues about water.

P7.00 HEALTH / FITNESS

Incorporate all aspects of health and fitness appropriate for the "Water" Project.

P7.01

Understand the basic elements of good health.

P7.02

Explain the structure and functions of the human body and its need for water.

P7.03

Establish a life long fitness plan.

P7.04

Demonstrate teamwork.

P7.05

Identify health problems and disease both locally and throughout the Water.

P7.06

Understand the need for immunizations and preventative health care for the military and their families.

P7.07

Calculate the cost of water products in relation to fitness and health.

P7.08

Identify locations in the world that have a shortage of water and their methods for solving the problem.

P7.09

Understand environmental issues in relation to health and water quality.

P7.10

Describe health care agencies in your community and ways that they utilize water.

P7.11

Investigate the latest in technology advances related to the availability of safe drinking water.

P7.12

Identify "Water" safety issues

P8.00 TECHNOLOGY

Use all forms of technology tools to access, manage and communicate "Water" Project information

P8.01

Recognize a range of technological tools and understand technological advances in the "Water" Project

P8.02

Understand the general purposes for a variety of technology tools

P8.03

Identify appropriate technological tools for solving simple and routine problems in the "Water" Project

P8.04

Demonstrate basic operational skills for computers, the internet, digital equipment and other technology tools

P8.05

Identify appropriate communication tools for accessing up to date information and solving complex problems in the "Water" Project

P8.06

Demonstrate ability to present "Water" Project information using multi media tools and world wide web applications.

P8.07

Interact with others, in your "Water Project" using digital communication tools

P8.08

Obtain "Water" Project information using all forms of communication tools including the Internet

P8.09

Make appropriate, reasonable and efficient connections between technologies and the need for water

P8.10

Produce effective and accurate multi media presentations appropriate for a specific audience such as CD ROMS, DVD's, Power Point presentations, and World Wide Web sites

P8.11

Evaluate two or more technology or communication tools used in the water industry

P8.12

Reflect upon current technology and communication tools and present a plan for the next generation of such tools

P9.00 CREATIVE EXPRESSION

Use visual art, graphic design, film, or music to creatively present "Water" Project information

P9.01

Research various creative expressions such as visual art, music, dance, and theater

P9.02

Analyze, interpret, create or perform a particular work of art in the "Water" Project

P9.03

Present work of art to an audience or at an exhibit

P9.04

Understand historical renditions of water "art" or "music"

P9.05

Use creative expression or graphical representations to convey multiple and divergent perspectives of the "Water" Project

P9.06

Research the historical perspective on a particular work of "Water" art or creative expression.

P9.07

Review, create or perform a musical work that is related to the "Water" project.

P9.08

Uses creative expression to portray the "Water" Project digitally.

P9.09

Demonstrate understanding of the need for water through story telling, music, visual arts, dance, drama, and food preparation.

P9.10

Investigate all aspects of an artistic organization and describe how they use water.

P9.11

Evaluate the role of creative expression in the world today.

P9.12

Describe the value of one type of art, design, music, film, theater or dance for the "Water" Project.

P10.00 CAREERS

Investigate and understand the careers associated with the "Water" Project.

P10.01

Investigate changes in these careers over time.

P10.02

Identify the multiple careers associated with the "Water" Project.

P10.03

Determine skills necessary for each "Water" Project career.

P10.04

Identify one "Water" Project career and research it in depth.

P10.05

Identify education necessary to obtain the skills for that particular career.

P10.06

Interview or "job shadow" various people in different "Water" careers.

P10.07

Investigate geographic location for specific "Water" careers.

P10.08

Research economic benefits from various careers.

P10.09

Create a World Wide Web site or advertisement presenting a career in a water industry.

P10.10

Create a chart, logo, or brochure for a water organization.

P10.11

Create a personal biography resume of your employability skills.

P10.12

Identify the personal responsibility skills necessary for particular "Water" Project careers.

P11.00 COMMUNITY SERVICE

Apply what you have learned in the "Water" Project by providing service to others.

P11.01

Demonstrate understanding for the need for service.

P11.02

Identify various ways that you can conserve water at your school.

P11.03

Determine various "water" service opportunities in your community.

P11.04

Identify a type of service for the "Water" Project.

P11.05

Determine the various volunteer opportunities.

P11.06

Develop goals for the service and a timeline to complete the assistance.

P11.07

Complete a service, of short duration, associated with the

"Water"
Project.

P11.08

Analyze the value of the service that was provided.

P11.09

Plan a lengthy service project with definable results.

P11.10

Identify the persons or locations that will benefit from the service to be provided.

P11.11

Create an evaluation form or response letter for recipient or organization receiving the assistance.

P11.12

Develop a comprehensive list of global service opportunities for the "Water" Project.

P12.00 WRITING

Write about all aspects of the "Water" Project using real world information from multiple sources including the Internet.

P12.01

Present a wide range of information about the "Water" Project.

P12.02

Include accurate information and the most important ideas about the "Water"
Project.

P12.03

Use complete sentences, correct spelling, correct punctuation, appropriate capitalization.

P12.04

Compose meaningful text applying knowledge of grammar.

P12.05

Present information and relationships with explanations and supporting details and the "Water"
Project.

P12.06

Write unified and well-formed paragraphs that present relevant content and specific information.

P12.07

Use transitions from one subtopic to the next.

P12.08

Write report using notes, interviews, pertinent data and multiple sources of "Water" Project information.

P12.09

Use the complete and accurate form required for the task (e.g., title page and bibliography).

P12.10

Use illustrations, graphs and charts to complement and explain the ideas in the text.

P12.11

Use headings and subheading to represent the appropriate levels of organization and describe the contents adequately and accurately.

P12.12

Produce an attractive, neat and easily read report or document that conveys all aspects of the "Water" project.

P13.00 PRESENTATION

Present "Water" Project work to a real or digital audience.

P13.01

Develop presentation and topic that are appropriate to the audience.

P13.02

Deliver presentation smoothly without notes.

P13.03

Organize a focused presentation.

P13.04

Use appropriate vocal inflections and verbal expressions.

P13.05

Evoke interest and attentiveness from the audience.

P13.06

Demonstrate clear connections to the "Water" Project.

P13.07

Include one or more areas of emphasis.

P13.08

Include all important information.

P13.09

Exclude extraneous details.

P13.10

Use appropriate technology and multi media tools.

P13.11

Respond appropriately to questions.

P13.12

Modify "Water" Project presentation to reflect audience questions and interest.

All or some of these standards can be identified based upon student level of learning and the "Water H2O" Project and the twelve Lessons. These all connect to state and national standards used on standardized measurements. They also promote student research, problem solving, data analysis, record keeping, portfolio products and digital presentations. These are all real Life2Learning skills.