Water Across Curriculum
Images and Activities

The Haggerty Museum of Art at Marquette University

Jon Horvath
American, b. 1979
*Untitled*, 2010
Archival pigment print
16 x 20 in
40.64 x 50.8 cm
2012.11.1
Gift of the artist
Collection of the Haggerty Museum of Art, Marquette University
HOW TO USE THIS GUIDE

Water is a hot topic in education these days and many curricula already exist for its study, but Water Across Curriculum takes a slightly different approach. Although this is not an art curriculum, the vehicle is art, the focus is water. Artworks from the Haggerty Museum of Art at Marquette University are provided as inspiration. Water facts, discussion questions, and activities are provided to aid you in teaching about all aspects of water.

Students learn differently, making teaching a complicated process. Educators are constantly searching for the “best” way to teach in their classrooms. Art can be a nonthreatening way for students to enter into learning. Keep an open mind and try some of the suggested discussion topics and activities, and you may discover that teaching with art is easier than you thought.

If you need extra help or you would like to have a museum specialist come to your school, contact the Haggerty Museum (Lynne Shumow, lynne.shumow@mu.edu or 414-288-5915) to request a classroom visit.

SUGGESTIONS FOR GENERAL USES OF IMAGES

Create image cards for students to use in games and other activities.

Games
- Start with any image card and match to another by any way possible—color, artist, content, shapes, etc. Try to connect as many image cards as possible.
- Categorize image cards into different topics related to water—transportation, food, the body, technology, pollution, culture, etc.
- Make two sets of image cards and play the game Concentration.

Create a museum in your classroom with water as your topic.
- Create displays with student charts, Museum and student artworks, reports, stories, suggested books for reference and reading, and current events bulletin boards related to water.
- Train students to be docents and invite parents for an “opening” just like in a real museum.

DISCUSSION STARTERS – TO BE USED WITH ANY OR ALL IMAGES

Examine the images, and use the following suggestions as discussion starters. Choose one, a few, or all as your inspiration.

SCIENCE/TECHNOLOGY/ECOLOGY
- List some of the properties (characteristic attributes or distinctive features) of water that you see in the images in the picture gallery. Here is a list of some of the distinctive properties of water:
  o Water freezes (and expands).
  o Water forms steam and takes up more space.
  o Water flows fairly easily.
  o Things float on it.
  o Things slide on top of it when it is frozen.
  o Water dissolves other things into it.
- Water can reflect light.
- Water is transparent.
- Things grow in it.
- Water moves and changes phases.
- Water can move other things like a vehicle.
- Because water dissolves things we use it to clean—how does water clean? What happens to the dirty water afterwards?
- Water can move with the help of heat and energy.
- Water helps things grow.

- Review water’s special properties above. How do we use water’s special properties in our society?
- Can you think of any properties of water that are not shown in these pictures?
- How is the water being used? How can you tell how water is being used? What evidence in the pictures tells you?
- How do we know things are happening (changing) in the pictures even though we don’t see the change?
- How do you use water? What is your favorite use of water?
- How is water used in science and technology?
- How do science and technology affect our water supply?
- Discuss different types of power plants and their advantages and disadvantages. How does water shape up against the other types? Water/solar/wind/ power/coal/nuclear/gas
- Bridges are a simple type of technology built to cross a body of water. Discuss different types of bridges. Make a report with pictures/charts showing different types of bridges and when they are used and why.
- Heat can be a problem in technology. Is water ever used to help with too much heat? How can you tell?
- Water moves energy. One type of water technology is steam power. Examples are steamboats and other steam-powered engines. When steam is formed, is there a problem (like pollution)?
- What do you think is in smoke? Does steam come out of a smokestack? Why?
- Have you ever seen contrails from planes? What are they made of?
- What is the process that makes saltwater into fresh water? Describe the process and cost and who would be most likely to use this process.
- Has technology helped or hurt us with our water use and misuse? Describe your findings.
- Water constantly changes. When combined with other substances, it can become part of a solution. Water tension changes how water works. Water changes from liquid to solid to gas over and over. Can you think of more ways that water changes?
- Water moves. Some examples of where water is moving are evidenced in aqueducts, dams, and waterfalls. How can we harness that energy and should we harness it?
- Explain how a canal works. How is water used in the canal?

**ACTIVITIES**
- An example of chromatography is the separation of overhead marker ink to discover black, green, and orange inks (and some others) are more than one color (property: water is used to dissolve and separate colors).
- Use chromatography to make art.
- Make a water cycle bracelet.
- Water property experiments (several set up as stations around the room).
• “Water Facts & Fun” activities.
• Create an aqueduct or bridge.
• Create a saltwater solution. Taste it. Should we use it for drinking water? Why or why not? If we used it, how would we make it potable?
• Do a paper marbleizing activity to show the miscible and immiscible property of water.
• Clean water using various filtering media—do it stepwise to see what comes out in each step. Try evaporating a sample from each cleaning to compare what was cleaned out each time.
• Note that it takes energy to clean water—we don’t really run out of water, we just make it unusable for reuse before cleaning.
• Use diluted grape juice in clear glasses to see if gas dissolves in water. pH changes when CO₂ dissolves in it, and color changes because of pH changes as students blow through straws into diluted juice.
• What is in the water? Make visual representations of water at the molecular level by looking at it through a magnifying source.
• Do purification exercises so kids can see how things filter out of the water.
• Create models of water samples at the molecular level (water and the things in it).
• Use multiple media to show what is in the water: 3-D models, watercolor, drawing, etc.
• Collect water samples and look at different kinds of water.
• Let water samples evaporate to see what is left behind.
• What needs to be in the water to support life (oxygen, minerals, food)?
• What could be in the water that is bad for life (litter, excrement from animals and people, fertilizer and weed killers, chemicals from industry, old medications)?
• Look at water at different scales using maps.
• Discuss the “stickiness” of water molecules. Create “water molecules” using marshmallows or gumdrops and toothpicks, or create “costumes” by having some students wear different-colored construction paper squares for hydrogen and oxygen and hold hands to show individual water molecules.
• Pour the same amount of water into containers of different sizes and shapes and then measure the amounts of water to show they are the same. Which property of water does this illustrate?
• You can observe surface tension by pouring water into a glass until it is very full. If you look carefully, you will see a dome of water form over the rim of the glass. Surface tension keeps the water from spilling over. The surface tension of water is strong enough to support insects travelling on top of the water. Soap and oil weaken surface tension by reducing the strength of the attraction between water molecules.
• Drop water onto the surface of a penny to see how many drops it will hold. Try dropping water onto different coins. Make a chart or graph to show how many drops each will hold.
• Place solid objects in a container of water marked with different levels (1 C, ½ C, ¼ C, etc.). As the objects displace the water, the water level rises. Measure the amount of rise to determine the volume of the objects. Chart your findings.
• To observe attraction (cohesion), squeeze small drops of water onto wax paper. As you pull the drops together with your finger, they will merge into one larger drop. This larger drop will resist being divided. If you gently press on the drop with your finger, it will flatten but it will not break, illustrating the concept that water sticks to itself.
• To illustrate water tension: make a pin or paper clip float on water, experiment with other objects to see if you can make them float. Predict which things will float before you try them. Were your predictions correct? Try placing objects into the water in different ways.
(vertically as opposed to horizontally, dropping as opposed to setting gently, etc.). Keep track of your predictions and results. Do your results change with different techniques?

- Compare/contrast the surface tension of water to other common liquids like cooking oil by seeing whether pins or paper clips will float in small amounts of these liquids. The liquids do not need to be thrown out, but can be collected and reused for similar demonstrations. To avoid getting liquids on fingers, use a tweezer to place pins and paper clips in or on the liquid surface.

- Punch holes in the bottom of an empty plastic bottle. Pour water into the bottle and as the streams of water pour out of the holes, tie a water “knot” by pulling the streams of water together with your fingers. Surface tension will keep the water together (like a knot) for a short period of time.

- Demonstrate displacement of water by floating a cork on an overfull bowl of water. What happens? Can you place the cork without having the water in the bowl overflow?

- Play with bubbles while exploring water properties. How big a bubble can you make before it pops? Can you make different shapes of bubbles? How? Use the bubble water to make bubble paintings.

- Stack ice cubes by adding salt between the cubes. Salt raises the temperature of water/ice, causing the ice to melt and adhere to the next cube, and creating a tower.

- It is easier to float in saltwater than in fresh water. Can you explain why? What does it have to do with water density?

- Talk about immiscible liquids (liquids that do not dissolve in water) and density; then make a “lava light” by layering oil and water.

- Pour water sideways down a piece of yarn. Cohesion keeps it on the string and prevents it from dripping off (cohesion: water sticks to other substances).

- Look at things underwater with a homemade magnifying glass to demonstrate the magnifying quality of water.

- Learn the water cycle song to the tune of “Clementine”:

  Evaporation, condensation,  
  Precipitation that’s the way.  
  Yes, it’s called the water cycle  
  and it happens every day.

  Oceans, lakes, ponds, and rivers  
  that is where it occurs.  
  Yes, it’s called the water cycle  
  and it happens every day.

- This song can be used with the water bracelet idea to reinforce the order of processes in the water cycle.

- Hand out the following weather folklore and discuss what they mean. Then have the students observe weather for a period of time—keeping track of conditions on a chart or in a journal—to see if these myths bear any truth.

**Weather Folklore**

- If crows fly low, winds going to blow; If crows fly high, winds going to die.
- Whether it’s cold or whether it’s hot, we shall have weather, whether or not!
- No weather is ill, if the wind is still.
- NEWS and weather; they travel together.
- A sunshiny shower won’t last half an hour.
• Rain, rain, go away; come back another day.
• Clear moon, frost soon.
• The moon and the weather may change together, but change of the moon does not change the weather.
• From twelve till two tells what the day will do.
• The more rain, the more rest; fair weather’s not always best.
• When seabirds fly to land, there truly is a storm at hand.
• To talk of the weather is nothing but folly; when it rains on the hill, it suns in the valley.
• It rains as long as it takes rain to come.
• The sharper the blast, the sooner it’s past.
• Yellow streaks in sunset sky, wind and daylong rain is nigh.
• Year of snow, fruit will grow.
• The chill is on, near and far, in all the months that have an “R.”
• Rainbow at noon, more rain soon.
• The south wind brings wet weather . . . the north wind, wet and cold together; the west wind always brings us rain . . . the east wind blows it back again.
• When a cow tries to scratch her ear, it means a shower is very near.
• Onionskin is very thin, mild winter is coming in. Onionskin is thick and tough, winter will be cold and rough.
• Ice in November to walk a duck, the winter will be all rain and muck.
• Rain before seven, quit by eleven.
• When the stars begin to huddle, the earth will soon begin to puddle.
• Evening red and morning gray speed the traveler on his way. Evening gray and morning red bring down rain upon him head.
• Rainbow in the east, sailors at peace. Rainbow in the west, sailors in distress.
• Pale moon doth rain, red moon doth blow, white moon doth neither rain nor snow.
• When the dew is on the grass, rain will never come to pass.
• Rainbow in the morning, shepherds take warning; rainbow at night, shepherds’ delight.

SOCIAL STUDIES/GEOGRAPHY
• Does everyone in the world have the same access to water? Do you think they should have?
• Discuss how waterpower has been used through history. What is an aqueduct and how is it used? How does it work? Create a working example of an aqueduct. Write a report about how aqueducts were used in ancient Rome.
• We tend to think that running water is a relatively new idea, but running water in homes, including toilets, were common in ancient Greece, Rome, and Egypt. Do a research paper about running water in ancient civilizations.
• How are bath and toilet houses in ancient Rome different than the toilet rooms and bathrooms we have today?
• Discuss the use of bottled water. Is it a good thing or a bad thing? Is this a new idea or has it been around a long while? Research bottled water in history. Is bottled water better for our health than tap water? Why or why not? What are the political implications of bottled water?
• Map reading/interpretation: identify major rivers and lakes, including the Great Lakes, on a map.
• Find the source and mouth of major rivers on a map of the United States/world.
• Find, identify, and define a delta.
• Follow the path Father Marquette and Joliet took up the Mississippi River.
Show the path from the Great Lakes to the Atlantic Ocean and relate it to the shipping industry. Where do the big ships come from that use the Port of Milwaukee?

Find and identify the Panama Canal. Why was this so important to trade?

Make model boats to represent boats from different cultures and time periods. How do ships today differ from those that Columbus used in the fifteenth century?

Water and maps – Discuss names for different water features on a map.

Find specific water features on a world/United States map: the Nile River, Lake Titicaca, San Francisco Bay, the English Channel.

ACTIVITIES
- Create a drawing of bath and/or toilet houses in ancient Rome, Greece, or Egypt. What evidence do we have of these things?
- Create a map with water features. Locate each type of water feature and name it on the map.

MATH
- How much total water is used during a day in your household?
- How much water is “used up” or dirtied so that it cannot be reused?
- How much could be “recycled” and what would need to be done to make that happen?
- How much water is used without using it up? (Examples would be floating across a lake, swimming, or boating).

ACTIVITIES
- Design a boat to carry large masses without sinking.
- Make a graph charting amounts of water used in the above activities. Make the graph informative and creative.
- Measure and estimate water use in your home and graph the results.

LANGUAGE ARTS
- Describe what you see in this photo.
- Do research on a water-related topic.
- Compare two or more artworks that are in some way related to one another (same artist, same topic).
- Explain what you see in an artwork you selected.
- Discuss your own personal connection to water.
- Discuss current events/issues related to water.
- How is water being used in this artwork?
- Where do you see water in this artwork?
- Interpretation: What is this artwork about? What do you see? How is it related to water issues? Which issue is it related to? How do you know?
- How do you feel when you look at this artwork?
- How did the artist use color/lack of color to convey his feelings?

ACTIVITIES
- Write a story or poem about this artwork.
- Create song lyrics related to one of the artworks in the gallery.
- Write a report about a water-related topic.
- Give a persuasive speech about water access, water pollution, waterpower, bottled water, or some other topic related to water.
Create a play inspired by one of the artworks in the gallery.
Create a water-related public service announcement video, a 30-second newscast, or debate a water-related topic.
Divide into groups and have kids do a storytelling activity where (as a group) they make up a story about the picture. Group members would be assigned to do a beginning, middle, and end of a story and present to the class.
Do a puppet show inspired by a water-related topic.
Tell a water story from a different point of view.
Create a song about water; it can be politically oriented or just for fun.
Create a water bulletin board on one of the major themes of this unit or on current events/issues in the unit.
Collect newspaper/Internet articles on water issues for discussion.
Select artworks that have water in them and have students connect the art to stories or poems that they know or have been studying.
Use water vocabulary words to write sentences or use vocabulary words as spelling words.

ART
How does this image fit into a unit on water?
Talk about perspective in an artwork. Perspective is a point of view also referring to the relationship of one object in respect to another object. A worm’s eye view would be a view of an object as seen from the eye of a worm or very low to the ground. A bird’s eye view would be from a bird’s point of view—up in the sky looking down. On the other hand, one-point or two-point perspective refer to a graphic representation of where an object is seen in space in relationship to other objects. Which perspective/point of view are we using in this painting? Worm’s eye view.
Is the art realistic/abstract? How can you tell?
Compare artworks on the same subject.
Discuss symbolism and how it is used in art.
Discuss how different media works in different artworks. Would a different medium be better for this topic?
Discuss parallel lines and symmetry. Listen to “Symmetry (I’m Beside Myself)” from the CD Songs in the Key of Art.
Is the artwork you have chosen pop art, impressionistic, realistic, etc.?
Read the label on the artwork to decide if it is a print, photograph, sculpture, painting, or drawing and tell the difference between the different types of art making.

ACTIVITIES
Choose a topic and create it first as a print or painting and then as a sculpture.
Create postcards about water-related topics.
Imitate specific art styles—pop art, Impressionist, Abstract Expressionist art.
Try your hand at screen printing.
Make and use casein paint.
Create a miniature water cycle by making a plant in a bottle necklace.
Is the artwork presented in warm or cool colors? Try creating it in the opposite colors.
Write with water crystals.
• Experiment with different media and techniques to create the illusion of water in art (watercolor, monoprints, embossing, tissue, impressionist techniques/pointillism, collage, etc.).
• Explain chromatography. Try it to create artworks on coffee filters.
• Choose an artwork from the gallery and “put yourself in the picture,” either with a photograph or drawing. Write about your new artwork.
• Create a weaving to go with an artwork—using the colors in the artwork.
• Read and create art labels for art you have made.
• Play the song “Roy G Biv” from the CD Songs in the Key of Art to learn the colors of the rainbow.
• Represent water in different ways. For instance, you could draw a lake on a map, a molecule of water vapor, a drop of dew on a leaf, or rain/snow.
• Take photos of water as you find it in your neighborhood and other places in your community (in parks, yards, in streets, puddles, creeks, etc.) Create a photo exhibit from your water photos of water in different environments. (You might show examples of polluted water, water in gutters, water with fish in a stream or pond, or even water in a water fountain).
• Find water in your world/neighborhood/community. Think about the big picture and the small picture—how does the small picture (the water you found) fit into the big picture (your neighborhood/community/city, etc.)?
• Create a print with a water topic and color it in.
• “Read a picture”—with no prior information about an artwork, look at it carefully and tell what you think it is about.
• Choose a topic and create it first as a print or painting and then as a sculpture.
• Make a book about a specific water topic.
• Create a daily journal to use as you explore the topic of water.

WHAT IS WATER?

Atop Mt. Atago in the Shiba District by Utagawa Hiroshige

Utagawa Hiroshige
Japanese, 1797 - 1858
Atop Mt. Atago in the Shiba District, 1834 - 1835
Woodblock print
8 1/8 x 12 5/8 in
20.6 x 32.1 cm
00.494.1
Gift of anonymous donor
Collection of the Haggerty Museum of Art, Marquette University
Discussion:
What is a rainbow?
Raindrops in the air act like prisms when the sun shines through them creating a rainbow effect. The raindrops actually split the colors in the white sunlight into different colors that reflect back to your eye as a rainbow.

Rainbows can happen only when three conditions occur at the same time: it must be raining, the sun must be shining, and the person observing must be between the sun and the rain.

When the sun and rain make a rainbow, they actually make a full-circle rainbow; we just can’t see it all because the horizon blocks it from view. Because a rainbow is an optical illusion, you can never really find the end of the rainbow. That’s why when you move the rainbow also appears to move.

There are usually seven colors visible in a rainbow: red, orange, yellow, green, blue, indigo, and violet. On rare occasions there is a double rainbow, the inner rainbow has red on the top and blue on the bottom while the colors on the outer rainbow are reversed. The outer rainbow is also not as bright as the inner rainbow. In very unusual circumstances, you may see an upside-down rainbow. In that case the sunlight is shining through a thin, visible screen of tiny ice crystals high in the sky that has nothing to do with rain!

Nighttime rainbows happen only when the moon is very bright and positioned just right so the falling rain can produce the perfect rainbow effect. They are very rare and are called moonbows. [http://www.weatherwizkids.com/weather-optical-illusions.htm](http://www.weatherwizkids.com/weather-optical-illusions.htm)

Activities:
- Irish legend states that there is a pot of gold at the end of the rainbow guarded by a leprechaun. What is a legend? Write your own legend about the origin of the rainbow.
- Play the song “Roy G Biv” from the CD Songs in the Key of Art to learn the colors of the rainbow.
- Use a prism to create a rainbow. Now make a rainbow with water. How would you do that? Experiment to find out. [http://www.wikihow.com/Make-a-Rainbow](http://www.wikihow.com/Make-a-Rainbow)
- The Wizard of Oz is a movie that has a rainbow in it. Show the movie and learn the song “Somewhere Over the Rainbow”.
- Do the Water Cycle Puppet Story. Students create puppets to use while a teacher reads the story out loud. Discuss the water cycle and how this story relates to it. [www.proteacher.org/a/25892_Water_Cycle.html](http://www.proteacher.org/a/25892_Water_Cycle.html)

Adventures of Randy the Raindrop

Randy the raindrop lived in a cloud, the heat from the sun made him big, strong, and proud! He got bigger and bigger until one day—Oh My! He fell through the floor of his house in the sky!

Randy was scared, then he noticed more raindrops falling, “Hey Randy, isn’t this fun?” they were calling. Then onto a leaf with a splash Randy fell, and what happened next is a strange thing to tell.
Randy was made up of water, you know, a part of him went to help the tree grow. The rest of him went into a puddle so round, then the sun came out and shone on the ground.

The sun warmed Randy and he started to change, He became water vapor—My, isn’t that strange? Little drops of water, too tiny to see floated into the sky—yes that was Randy! Randy’s home once again was a cloud in the sky, he was a raindrop once more, but then by and by . . . The sun made him bigger and bigger and then . . . He fell through the floor of his house once again!

Tom Uttech
American, b. 1942
*Three Cascades, Union River, Porcupine Mountain State Park, Michigan, October 16, 1972*
Gelatin silver print
7 7/8 x 8 in
20 x 20.32 cm
97.8.3.2
Gift of Robert Burkert
Collection of the Haggerty Museum of Art, Marquette University

**Three Cascades, Union River, Porcupine Mountain State Park, Michigan, October 16, 1972** by Tom Uttech

**Discussion:**
Tom Uttech is a Wisconsin artist who usually does very large-scale paintings of the Northwoods. Read the label for the *Three Cascades, Union River, Porcupine Mountain State Park, Michigan, October 16, 1972* artwork to see how the size of this one is different from Uttech’s usual art (This is a photograph and it is only 7 7/8” x 8”).

Describe what you see in this photo. This looks like water in the woods. It kind of looks like small waterfalls, leaves, and trees.

What colors are used in this photo? This is a black-and-white photo. Why do you think Uttech made this in black and white and not in color? Accept any logical answers.

This is a nature photo. How is the water in this picture used by nature? Animals would use this water for drinking; we might use it for watering plants. When this water evaporates it will turn into
water vapor and go back into the water cycle. Explain how water is constantly changing form (liquid, gas, water) as it goes through the water cycle.

Activities:
- Represent water in different ways. For instance, you could draw a lake on a map, a molecule of water vapor, a drop of dew on a leaf, or rain/snow.
- Take photos of water as you find it in your neighborhood and other places in your community (in parks, yards, streets, puddles, creeks, etc.). Create a photo exhibit from your water photos of water in different environments (You might show examples of polluted water, water in gutters, water with fish in a stream or pond, or even water in a water fountain.).
- Find water in your world/neighborhood/city/community. Think about the big picture and the small picture. How does the small picture (the water you found) fit into the big picture?
- Write a report about the importance of keeping water clean. Give a persuasive speech to classmates to convince them NOT to throw garbage into the water.
- Recreate the Tom Uttech photo above as a painting or drawing using color instead of black and white.

Lesson plan:
What happens to puddles (charting evaporation) website:
http://cases.soe.umich.edu/plans.php?frame=main&dqid=320&lpid=127

Water in Our Bodies—Hygiene and Health

My Blue Lake by Kiki Smith

Background Information on Kiki Smith

Kiki Smith is known for her sculptures, drawings, and prints that focus on the human body, often her own body. After making a number of prints of various parts of her own body, she became interested in creating a picture that showed the skin of the body as a flat image, similar to the way a map becomes a flattened version of the globe. Working with printers at the Universal Limited Art Editions workshop, Smith gained access to a special camera (of which there are only three) at the British Museum in London. The camera was designed for use in geological
surveys and can produce a 360º image. Smith spent a week at the British Museum being photographed on a rotating table to make this image. When she finally came out, she had a photographic negative that could be made into a printing plate. In making the final print, Smith added marks through the process of lithography, and hand-colored the images as they came off the press. The resulting print with its red and blue color presents an unusual self-portrait that suggests a blending of landscape and the human form. [http://collections.walkerart.org/item/object/7449](http://collections.walkerart.org/item/object/7449)

**Discussion:**

- How does this image fit into a unit on water? The title clues you in to what she was thinking and if you look at it quickly, it could be mistaken for water, land, and sky.
- How did Kiki Smith create this image (see description above)? She used a camera that flattens out an image similar to a map of the world (or like that when peeling an orange). Peel an orange to demonstrate. This image seems particularly appropriate when you consider that 70-80% of the human body is made up of water and this image looks like mostly water!
- Where can water be found in the body? You can find water in sweat, mucus, saliva, tears, urine, blood, and even in the liquid in cells. **FUN FACT:** What do a human brain, a chicken, and a tree have in common? They’re all about 70% water!
- In the Kiki Smith picture, it looks like Kiki is becoming the water. How do you and your body affect the water in the environment? List some things that you do that can have an effect on the environment (boating, swimming, sewage, brushing teeth, drinking water, washing clothes and dishes, using the toilet, etc.).
- Discuss water in your body—where is it? How is it used? Sweat, mucus, blood, urine, tears, saliva, etc.

**Activities:**

- Recreate the Kiki Smith photograph in paint or colored pencil, but put your face in it.
- Kiki Smith looks like she is part of the water in this photo—as if she is physically connected to it. Think about your personal connection to Lake Michigan and explain your personal story.
- Create a poem or story about this artwork (*My Blue Lake*).
- Discuss different photography techniques, and then try to recreate this picture with a different medium.

---

*Perimeter* by Kevin J. Miyazaki

- The photos above are from Kevin Miyazaki’s *Perimeter* project. These people had their photos taken while on the shores of Lake Michigan. Each one was asked about his/her
personal connection to Lake Michigan. Have your students look at some of the photos and make up their own captions without looking at the actual quotes.

- Do the Aquabodies activity (Western Upper Penninsula Center for Science, Mathematics and Environmental Education website: wupcenter.mtu.edu). Discuss what percentage of the body is water. Then do a body-tracing activity to show how much of the body is water (good for primary).
- Do the Hydration lesson plan (http://pbskids.org/lunchlab). Discuss hydration, then do the crossword, and color in the body and the earth to show the locations of fresh water and saltwater on the earth.
- Read the book A Life Like Mine: How Children Live Around the World (printed by DK Publishing in association with UNICEF/United Nations Children’s Fund) and discuss how children in other countries live without proper access to water. How do they cope?
- Discuss how water is used in other cultures and how that relates to their access to water. How does their water use and access compare to ours in America?
- Research the various systems of the body and do a report with illustrations to show how water helps all the systems in the body (Digestive System, Circulatory System, Endocrine System, Lymphatic System, Nervous System, Respiratory System, Excretory System, etc.).
- List the different names and definitions for the fluids found in the body (saliva, blood, sweat, tears, etc.), where they are located, and how they are used.
- Write a story about your life as a child in a country with very little water. Write the details of your day and how the lack of water affects your life.
- Research plant and animal cells. Describe the difference and how water is used in each. Explain how some plants, unlike animals, can live long periods of time without any water at all. Make diagrams of the cells showing their differences. http://www.biology4kids.com/files/cell_main.html
- Put a flower into a vase of colored water. Watch as the color gets absorbed into the leaves and petals of the flowers, discuss how the color got there, and the role that water plays in this phenomena. What evidence does this provide for how water moves within a plant?
- Explain how water gets into plants through capillary action with xylem vessels and how water leaves the plant through stomata, helping plants to cool down. Do a diagram of a plant showing these parts and how the water flows through them.
- Explain how plants get water into their systems through transpiration. Research and explain photosynthesis with charts. Explain how osmosis works to physically support the plant.
- Imagine your water had been shut off in your home due to a problem with the water supply. Write a story about the things you would need to do to be able to do normal, everyday activities.
- Go to the Mayo Clinic website and find what percentage of our body parts are made up of water. http://www.mayoclinic.com/health/water/NU00283. Name three other interesting facts about our bodies and water that you find on that website. http://www.mayoclinic.com/health/medical/IM00594

**Lesson Plans:**
- Do the Aquabodies activity from the website listed below. Discuss the amount of water in your body. Then draw around your body and color in how much of it is water. There is also a discussion of how much water is in food, and also how much of the water on the earth is fresh water as opposed to saltwater.
- Do the Water is Your Best Friend lesson plan (for kindergarten and early primary grades). The lesson discusses how water is essential to life and the proportion of water in the body. Activities include singing the song “We Need Water to Survive” to the tune of “Old Mac Donald” [www.drsrd.com](http://www.drsrd.com) (Dublin San Ramon Services District, Dublin, CA).

- The Hydration lesson plan on the website below discusses the importance of keeping the body hydrated and how to do it. It contains a crossword puzzle and a coloring page. [http://www.pbs.org/teachers/includes/content/lunchlab/hydration.pdf](http://www.pbs.org/teachers/includes/content/lunchlab/hydration.pdf)

- Create a poem or story about this artwork.

- How does your body affect the environment?

- Discuss photography techniques and try to recreate this picture with a different medium.

---

**Esperanza or Macarena of Miracles** by Audrey Flack

**Discussion:**

**Why do we cry?**

**Tears**

Humans have tear ducts that lubricate and protect our eyes from dust and other particles. The ducts, which are under the upper eyelids, produce a salty liquid known as a tear. Tears spread throughout the eye each time we blink. While animals have the ability to produce tears, they are not used for the same reasons that humans use them.

Humans cry for many reasons. They cry to cleanse the eye, relieve stress, to express pain, to communicate, and often as a part of cultural ceremonies such as weddings or funerals.
There are three types of tears generated by the human eye. Basal tears help protect the eye and keep it moist. Reflex tears are used to flush irritants out the eye. Emotional tears come as a response to sadness, distress, or physical pain.

Emotional tears contain more manganese, an element that affects temperament, and more prolactin, a hormone that regulates milk production, than other tears. Studies have shown that by sobbing out manganese and prolactin, the body’s stress levels become balanced and chemical buildups are eliminated, relieving tension and making the crier feel better.

We probably produce emotional tears as a means of communication. Crying also helps create an emotional bond with others. Even when spoken communication is difficult due to language differences, emotions are universal. People understand that there are culturally acceptable reasons for crying such as at weddings and funerals. Crying is merely a sign of being human.

http://scienceline.org/2006/10/ask-driscoll-tears

Although emotional crying is thought to be unique to humans, some animals do appear to cry for emotional reasons. For instance, elephants appear to grieve when a family member dies. They not only guard the body but will travel long distances to view it. Elephant experts at the London Zoo once told Charles Darwin that the animals do indeed mourn. Chimpanzees also appear to cry, but scientists still insist that these tears are strictly for cleansing the eye.

Some tears contain a natural antiseptic which sanitizes and lubricates the eye. A substance called NGF, the nerve growth factor, is also present in some tears and helps to heal the eye as well as provide an antidepressive effect which moderates moods.


Talk about the water in your body. Where is it? How does your body use water? How does it get there? Where does it go?

**Activities:**

- Create a print of someone crying, and then color it in with watercolor pencils or watercolors.
- Think of a time when you were distraught. Write a poem about that time.
- What makes us cry? See if you can do research to find out why (scientifically) we cry.

Jocelyn Lee
Italian, b. 1962
*Untitled (Mimi in nightgown), 2002*
Pigment print
15 x 14 in
38.1 x 35.56 cm
2011.24.5
Museum purchase with funds from Mrs. Jean Messmer in memory of Dr. Charles Clemens Messmer by exchange
Collection of the Haggerty Museum of Art, Marquette University

*Untitled (Mimi in Nightgown) by Jocelyn Lee*
Use this image to illustrate the percentage of water in the body visually. Notice where the horizon line is behind the girl. It marks almost the exact percentage of water in the human body.

Discussion:
The human body is made up approximately 70% water. It is interesting that this photo shows the horizon line of the water at approximately three-quarters of the way up the girl’s body where the water content would be.

- How is water used in the body?
- What systems in the body use water?
- Name some forms of water that you find in the body (tears, saliva, urine, etc.).
- What is the purpose of each of the types of water?
- Describe the journey that water takes through the body. Refer back to the online guide.
- What is the difference between hydration and dehydration? Why is dehydration a bad thing?
- Although we can live without food, the body will only survive three-five days without water. What happens to the body when it does not receive enough water?

Activities:
- Write a story about this photo—why is she outside in her nightgown?
- Do the Aquabodies activity from the website listed below. Discuss the amount of water in your body. Then draw around your body and color in how much of it is water. There is also a discussion of how much water is in food, and also how much of the water on the earth is fresh water as opposed to saltwater.
  http://wupcenter.mtu.edu/education/familysciencenight/lesson_plans/Aqua_Bodies_Lesson_Plan_K-2.pdf
- Do the Water is Your Best Friend lesson plan (for kindergarten and early primary grades). The lesson discusses how water is essential to life and the proportion of water in the body. Activities include singing the song “We Need Water to Survive” to the tune of “Old MacDonald” www.dsrsd.com (Dublin San Ramon Services District, Dublin, CA).
- The Hydration lesson plan on the website below discusses the importance of keeping the body hydrated and how to do it. It contains a crossword puzzle and a coloring page.
  http://www.pbs.org/teachers/includes/content/lunchlab/hydration.pdf

Marc Chagall
Belorussian, 1887 - 1985
Rebecca at the Well, 1957
from The Bible Series
Hand-colored etching
24 x 18 in
61 x 45.7 cm
80.7.65
Gift of Mr. and Mrs. Patrick Haggerty
Collection of the Haggerty Museum of Art, Marquette University

G. Viviani
Rebecca At The Well
Marble
43 x 14 1/2 x 12 in
109.2 x 36.8 x 30.5 cm
79.19
Gift of Miss Frances F. Gumina
in memory of Sam & Concetta Gumina
Collection of the Haggerty Museum of Art, Marquette University

Rebecca at the Well by Marc Chagall and Rebecca at the Well by G. Viviani
Discussion:
These two artworks have the same theme but were created in different media. One is an etching and the other is a sculpture. What is a sculpture? Sculpture is a three-dimensional art form. How is it different from a painting or an etching? You can walk around it. It is not flat against a canvas/wall.

Both these artworks show Rebecca with water she got from the well. It was common in Biblical times to get water from a shared well. People took their own jugs to the well in the center of town, filled their jugs with water, and took them back to their own homes. Everyone had special jugs for this purpose.

Notice the way that Rebecca is carrying the jug in each artwork. People often carried the jug either on top of their heads or up high on one shoulder. Look at the sculpture. How is she carrying the jug? Is she carrying it or leaning on it? Which way would be easier to carry a full jug of water? Why?

Which of these artworks do you like best?

Water is a necessity for life. Over 70% of your body is water! Although we need it to survive, not all people have equal access to clean water.

Activities:
- Make a list of the different ways water is used in our bodies.
- Create a water jug with clay. Discuss the use of an amphora in past history for carrying things as opposed to the bags which we use so much for carrying things today.
- How much water does each person in the United States use per day? The answer is approximately 100 gallons! List the ways we use water every day.
- Have your students collect gallon milk jugs and bring them to school. Hang them from the ceiling until you have 100 jugs to visualize 100 gallons. Have students do a little research to see how much water people in other countries use and compare. Create a chart that shows the differences.
- What are the impacts of water shortages? Explain personal and communal complications and how people (individually and in communities) cope with water shortages.
- Explain what causes water shortages. Name at least two things that impact availability of the water supply.
- Create a water conservation wheel using the activity on the Aquarion water website: www.Aquarionwater.com and try the conservation word scramble activity.
- Discuss the chart below. It shows different areas of the body and how water is used in each area. http://www.mayoclinic.com/health/medical/IM00594 (Used with permission.)
Read the section on how children in other countries get their water from the book *A Life Like Mine: How Children Live Around the World* (printed by DK Publishing in association with UNICEF/United Nations Children's Fund). Compare ways in which children get their water and how they have access to water. Discuss how these differ from how we in the United States get our water.

**Lesson Plans:**
- Use the Traveling for Water lesson plan as a research-and-discussion activity. It discusses water access around the world with descriptions of different places on Earth. It contains a global-awareness chart, reading exercises, and a word puzzle. More advanced grades (middle school level) may use the Global Awareness World Tour activity for discussion ([www.water.org](http://www.water.org)).
- Explain the geographic/economic/political factors involved in water supply and availability.
- Do the A Drip in Time Saves Nine lesson plan from the Aquarion website ([www.aquarion.com](http://www.aquarion.com)) to show that the consequences of a small water leak may be huge!

**Making a Personal Connection with Water**

**Perimeter by Kevin J. Miyazaki**

**Discussion:**
- What is in the water?
- In Franz Boas's study of the color of seawater, he states that people see different things differently. Things appear differently to the same person from different angles and in different lights. All water is as multicolored and multifaceted as the seawater Franz Boas tried so hard to understand. The color of water is affected by many things including content and light. Each of these photographs was taken at a different time of day—on cloudy, partly cloudy, or sunny days. Different depths show different colors as do different content in each area. List as many things as you can that could be affecting the color of the water in these photos.
• Compare Miyazaki’s photos of Lake Michigan with other large bodies of water represented in paintings or photographs. Speculate on why the colors are so different.
• Talk about pollution—how it happens and how to stop it.

Activities:
• Arrange Miyazaki’s horizon photos like tiles to create a value chart to mirror their positions on the value chart.
• Go around the neighborhood and take pictures of water wherever you see it (inside and out—toilet, sink, tub, shower, puddles, lake, pond, streams, in gutters, etc.). Then make your own exhibit of where water was found. Make a map of the neighborhood and tack your photos to the appropriate places in the neighborhood. Using the images you have made, identify whether the water is greywater, blackwater, or fresh water.
• Talk about water purity. View it under the microscope (or through a viewing scope kids can make). Draw what you see.
• Talk about pollution—how it happens and how to stop it.
• Choose three pictures from the horizon series and create a story line.
• Take pictures of water around your neighborhood/city/house and compare colors and content.
• Create a mural using some or all of the horizon pictures as your background.
• Create clay tiles trying to match the colors of blue above.
• Do a report based on the colors you see in the pictures. What makes the water those colors? Create a chart to illustrate your findings.
• Create poetry based on these photos.
• Create your own Perimeter project. Take photos of students in your class and ask them to explain their personal connection to the lake. Then create an exhibit of photos and explanations.
• Add a photo that you have taken to those below and create a story based on the new picture.

Kevin J. Miyazaki
American, b. 1966
Perimeter, 2012
Digital C-prints
24 x 20”
Commissioned by the Haggerty Museum of Art, Marquette University

• Go through the Perimeter photos and locate sites on a map of Lake Michigan where they were taken. Then make up your own story based on the photos. Pretend you are doing a
travelogue or a tourism story about Lake Michigan or, to make it more about the people, do your story from the point of view of an author or newspaper reporter.

- Make ceramic or paper tiles from the photos and arrange into a “mosaic” picture. Older students could use the computer to arrange the photos artistically.
- Choose three pictures from the Perimeter exhibition and create a story.
- Make postcards using the Perimeter project. Show where the photos came from on Lake Michigan.
- Collect water samples and look at them under a microscope. Draw pictures of what you see. Identify, if you can, microscopic plants and animals in the sample.
- Create a poem or song about the lake.
- Think of water on a small scale as well as on a large scale—molecular as opposed to Lake Michigan.
- How close are you to Lake Michigan (emotionally and physically)? Tell your story.
- Miyazaki’s pictures are of Lake Michigan. Why is Lake Michigan important to us as citizens of the Milwaukee area? What are some important ecological issues related to our use of the water in Lake Michigan?
- How do we use the lake (personally and as a community)?
- Create models of water samples at the molecular level (water and the things in it).
- Use multiple media to show what is in the water (3-D models, watercolor, drawing, etc.).
- Collect water samples and look at different kinds of water.
- Let water samples evaporate to see what is left behind.
- What needs to be in the water to support life?
- What could be in the water that is bad for life?
- Look at water at different scales using maps—lakes, ponds, oceans, rivers, gulfs, bays, etc.
- Look at Miyazaki’s Perimeter pictures and figure out what each person’s connection is to the lake/water. What evidence in the picture helps you know how the person is related to the lake/water?
- Recreate the colors in the horizon photos by mixing paint.

Discussion:

Water is vital to our physical life, but it also sustains our mental and spiritual lives. Humans respond to water through religion, art, and science to better understand its meaning in our lives and in the life of our Earth. Water connects us all.

Water of sufficient quality and quantity is essential for all living beings on the earth. Managing our water resources is key to providing the future population with social and economic stability in a healthy and sustainable environment.

Because water replenishes all living things and connects us all worldwide, it is the obligation of each individual to accept a personal responsibility for our water resources and make a commitment to conserve and protect our water supply.

Settling near water

Throughout time people have always settled near bodies of water. The first great civilizations appeared alongside water, including the great river cultures of the Nile, the Tigris and Euphrates, the Indus, and the Yangtze. These civilizations owed their success in part to their easy access to water and the expansion of trade that resulted from that access. Islands with safe water ports have also thrived for the same reason.
Access
In areas where water is scarce, access to clean drinking water is a major factor in human development. There are some communities that have been able to find creative ways to cope with their water access problems. Rich countries like Saudi Arabia, for instance, have spent billions of dollars developing plants that convert salt water to fresh water. In Peru where money and water are more scarce, people stretch tarps between the trees to catch the morning dew.

Religion
Long before scientists began to examine its properties, water was already established as the mysterious and sacred source of life, and its importance and symbolism was firmly established in the framework of the world’s religions.

Water, considered a purifier in most religions, is used to physically clean the body as well as to metaphorically wash away impurities and sins. Most major faiths incorporate ritual washing into their ceremonies. Baptism, ablation, and washing before praying are common practices, as are pure water baths for the dead.

Water is often referred to in religious holy books including the Bible and the Qur’an. According to the Bible, “the earth was formed out of water and by water” (2 Peter 3:5). Similarly the Qur’an states that living things are made of water, and in fact, water is used when describing paradise.

Philosophy
The ancient Greeks believed that water was one of the four classical elements: fire, air, earth, and water. Water was regarded as the ylem, or basic substance of the universe.

In the traditional Chinese philosophy of Taoism, water was also one of the five elements: earth, fire, wood, metal, and water. For Taoist philosophers, there is nothing in the world more soft and weak than water, and yet there is nothing better for attacking things that are firm and strong.

Literature
Water is used in literature to symbolize purification. For instance, note the critical importance of the river in William Faulkner’s novel As I Lay Dying and the drowning of Ophelia in Hamlet. Even Sherlock Holmes stated that “from a drop of water, a logician could infer the possibility of an Atlantic or a Niagara without having seen or heard of one or the other.”

Art
The myriad and sometimes contradictory qualities of water: both lifegiving and destructive, powerful and serene, a barrier and a bond between people, make it a fertile subject for fine art.

http://witcombe.sbc.edu/water

---

Barbara Morgan
American, 1900 - 1992
Children Dancing by the Lake, 1940
Gelatin silver print
13 5/8 x 17 15/16 in
34.6 x 45.6 cm
91.3.61
Gift of Lloyd and Janet Morgan
Collection of the Haggerty Museum of Art,
Marquette University

Children Dancing by the Lake by Barbara Morgan

Discussion:
Each of us relates to water in a different way. Water can cool you down on a hot day, just as a hot shower can warm you on a cold day.

- What are these children doing? How does it relate to water?
- How do you use water in the summer when it is hot?
- If there is no lake nearby, where might you find water to play in or near in the summer?
- Besides the water in the lake, where else do you think water is in this picture?
- What time of day do you think this is? What clues do you have?
- Do you dance like this when you go to a lake?

Activities:
Brainstorm activities that you could do with water in the summer time.
- Blow bubbles and create bubbles. Explain why bubbles keep their shape.
- Fill up squirt guns and shoot one another to keep cool.
- Fill squirt guns with water-based paints and squirt T-shirts with the guns.
- Make pictures with watercolor markers and then wet the paper and watch the colors spread.
- Paint or use chalk to make drawings on wet paper.
- Paint with water on paper to make designs that evaporate away.
- Experiment with different materials to make sailboats and then sail them on a lake, pond, blow-up pool, or fountain. Race your boats to see whose is fastest.
no world by Kara Walker

Background Information on no world
Two large hands in a churning ocean carry a ship, presumably a slave ship, to the shore of the New World, where silhouetted figures seem to represent a landowner bargaining with a native inhabitant for corn. The title “no world” is a pun on “New World,” and the lower case letters give an opportunity for additional commentary, priming viewers for the experience of seeing the ship carried toward a place unfamiliar, harsh, a destination but not a home for the captives on board. Beneath the waves floats the silhouetted form of a female figure; perhaps it is the artist’s soul, perhaps the collective soul of the people held within the slave ship, perhaps a general indicator of the identity of those people forever lost as the ship leaves the homeland farther and farther behind. no world is a grand, sweeping picture that shows a new land, a transported ship, and a figure beneath the waves that moves viewers tremendously as they contemplate the figure’s tragic inability to act or survive.

“Most pieces have to do with exchanges of power, attempts to steal power away from others.”
—Kara Walker

Kara Walker’s work is layered with images that reference history, literature, culture, and the darker aspects of human behavior. Connecting all of her work is an examination of power. The characters in her environments display power struggles of all kinds: physical, emotional, personal, racial, sexual, and historical. Making sense of these images requires careful looking and an understanding of the references the artist makes. Walker is known for parlaying the genteel 18th-century art of cut-paper silhouettes into scathing, racially charged installations. The role of water in the history of black people in America is shown as beginning with the Middle Passage from Africa, the subject of a hallucinatory five-panel gouache work by Ms. Walker. Walker’s key themes: Representing Race, History: Collusion of Fact and Fiction, Narrative, Desire and Shame, and Humor.
http://learn.walkerart.org/karawalker/Main/IntroductionToThemes

Discussion:
• This is a good piece to try “picture reading” with your class. Give no introduction or information and ask them to tell you what is happening. Get them to observe and tell what they think they see. There are no wrong answers. Just repeat and record what they say. Validate by repeating their words. Another way to do this would be to have them
look and interpret into words what they think they see. Then tell them about Kara Walker and her themes and ideas. Ask them to look again and interpret.

- Why do you think Ms. Walker painted the large hands holding the ship? (It could be that the ship is being held captive and moved by the hands to the new world with no input from the slaves aboard the ship. Another interpretation could be that the hands of God were holding them to keep them safe through the journey and their life in the new world.)

- There is a woman under the water. What happened to her? Who is she?

- Make up your own story about this picture. What does it mean to you without knowing what the artist intended?

---

**Edge of Town (Missouri River) by Thomas Hart Benton**

**Discussion:**

- Why did I choose this picture?
- How is water being used?
- Can you see the people? What are they doing? Have you ever done this?
- Can you see evidence of other water?
- How else do you use the water here? What is a lithograph? Explain the process.
Rodolphe Ernst
Austrian, 1854 - 1932
*A Moor Robing After the Bath*, 1860s - 1930s
Oil on panel
20 7/8 x 17 1/2 in
53.02 x 44.45 cm
82.1.1 Gift of the Estate of Claire Hoff Toole
Collection of the Haggerty Museum of Art, Marquette University

*A Moor Robing After the Bath* by Rodolphe Ernst

Discussion:
- Look at this picture. What do you notice about the interior decoration?
- How many different patterns can you count?
- What materials were used in the decoration?
- Do you think this is in the United States? Why? Why not?
- What is the title of the painting? What country are the Moors from?
- What room are these people in? Does your bathroom look like this? How is it different?
- Who is the man in yellow? Do you have servants at your home?
- Look at the clothing they are wearing. How is it different from clothing you wear?
- What is the white cloth on the man on the left? Do you use a large cloth like this after a bath? How is the bath itself different from your bath?
- Water is used for many different things. Often water is used to bathe to become physically clean, but sometimes people bathe to become spiritually clean. Many religions do ritual cleansing before specific ceremonies. It's possible these men are Moslem and they are doing a ritual cleansing.
- The artist is named Rodolphe Ernst. What country is he from? Why would he do a painting of Moors?

Activities:
- Look at the shoes the man in yellow is wearing. What are they called and why do they look like they do?
- Do a report on different kinds of shoes. Make drawings of different kinds of shoes throughout history and create a large chart showing how shoes have changed throughout history.
- Look at the tiles on the wall. Do a report on Moorish tile patterns. Create an Islamic tile pattern that might be typical of the Moors.
- Notice the rug on the bench. Do a report on Moorish rug patterns and weave a rug of your own.
Mono Lake by Barbara Morgan and Morton A. Mort by Roy Lichtenstein

Discussion:

- These are both images of water. Can you find the water in each picture?
- What process or medium did these artists use to create these artworks? How is a woodcut made?
- These were created by different artists, why are they grouped together?
- How did Roy Lichtenstein show the different areas of his artwork?
- What kind of a sky is in Lichtenstein's painting? Is it stormy, calm, rainy, cloudy? How do you know?
- What kind of lines does Lichtenstein use? What about the colors he uses? What other kind of picture do you think of when you look at Lichtenstein’s print?
- Look at Morgan’s artwork. What kind of colors did she use? What kind of feeling do you get when you look at her print?
- What kind of weather is shown in the bottom print?
- Do you get the same feeling when you look at these artworks? What is different?
- Artists use many different types of media and techniques to show water. Look at the labels. How are the media/processes different? What is embossing?
**Activities:**
- Have children create their own abstract picture and write their own labels.
- Create a very geometric linoleum print like Lichtenstein’s.
- Experiment with different media and techniques to create the illusion of water in art.

**Wallace Herndon Smith**
American, 1901 - 1990
*Leeward Start*, 1985
Oil on panel
29 1/2 x 24 1/2 in
74.93 x 62.23 cm
Gift of Mary B. Finnigan
Collection of the Haggerty Museum of Art, Marquette University

---

**Leeward Start by Wallace Herndon Smith**

**Discussion:**
- Look at the name of this painting, *Leeward Start*. Now look at the painting. What do you think this painting is about?
- Sailboats are a common theme in paintings. Why do you think this is?
- Where can you go in Milwaukee to see sailboats?
- To tie this into our water theme, talk about water recreation etiquette (i.e., don’t throw litter in the water, be considerate of others when entertaining on your boat, etc.)
- Look at the colors—are they realistic? Do you usually see yellow and orange in the water? This painting is an example of Impressionist painting.
- In Impressionism, artists use small patches of color instead of coloring large areas with the same color or creating a color on a palette and then painting. Many colors are used together in small swatches and your eye then mixes them to give the *impression* of a certain color. Complementary colors are used side by side to make the colors “pop.” Also, unusual colors are used where you least expect them.
- Look at *Leeward Start*. What time of day do you think this is? What makes you say that? Is that the sun or the moon in the sky?
- We know that water is usually moving. How has Mr. Smith made the water look like it is moving?
- What property of water allows a boat to float on the water and not sink?

**Activities:**
- Try your hand at Impressionist painting. Create a water scene using this technique.
• Make a sailboat to float on the water. Try different materials to see which ones work best.
• Try making a sailboat painting using chalk or pastels on wet paper.

**Thin Ice, Low Levees by Frances Myers**

**Discussion:**

- Frances Myers’ *Thin Ice, Low Levees*, is a study of weather disasters with Alfred Hitchcock symbolism included. Who is Alfred Hitchcock? What symbolism is included in this artwork? All are mysterious images that you might expect to see in one of Hitchcock’s films.
- *Thin Ice, Low Levees*—What is a levee? What is its purpose? (There are at least three meanings for the word “levee” that could be used here. Commonly a levee is an embankment used to prevent flooding. In agriculture, it is a continuous ridge built around an area of land to be flooded for irrigation. A third definition is for a river landing or pier.) Look at this work and see if you can figure out which is the correct meaning of “levee.”
- Where do you see water in these images?

**Activities:**

- What is this picture about? Make up your own mystery story about it. Then create a photomontage to go along with your story using your own photos or images from magazines or the Internet.
- Try separating the images and putting them into different orders. Retell the story.
- Make up a poem about the picture above.
- Choose images from the Internet and, using your computer, manipulate the images to create a new story in pictures. Can you make the story clear enough through images that you don’t need words?
Julius Hüther  
German, 1881 - 1954  
*Winterfreude (Pleasures of Winter)*, 1931  
Oil on canvas  
39 1/2 x 27 1/2 in  
100.3 x 69.8 cm  
87.4.1  
Gift of Marvin and Janet Fishman  
Collection of the Haggerty Museum of Art, Marquette University

*Winterfreude (Pleasures of Winter)* by Julius Hüther

**Discussion:**
- Can you see water in this painting?
- Is snow a liquid, a gas, or a solid?
- What is happening in this picture? How are the people using water/snow?
- What form of water is snow? Review the properties of water, specifically how it expands or contracts in different ways than other elements.
- Look at the girl's coat. The weather is cold and snowy, but look how she's dressed. Do you notice anything unusual? Does she look cold?
- Look at the title of the picture. It is written in German. Try to learn to say something in German.
- Discuss a properties of water (freezing/boiling) experiment to see if your ideas or theories are correct by measuring water, boiling, then measuring again. Freeze water and notice how the surface has risen since the water was put in the freezer.
- Can you think of ways in which this freezing/thawing property of water affects us through weather? Why do we put salt on icy sidewalks? Can you come up with more experiments to show this phenomenon?
- Discuss glaciers and how they affect the land.
- What water activity might this girl be doing if it were a different season?
- Where does snow come from? Explain the water cycle as you are answering this question.

**Activities:**
- Paint a snow scene with people doing many outdoor activities.
- This picture looks a little like a postcard. Use your ruler/yardstick to measure out a space as big as this artwork to see how big it really is.
- Water here is in a solid state (ice). How do we slide on snow?
**Open Channel** by David True

**Discussion:**
- What do you see in this picture?
- What do you think is happening? How is water playing a part?
- What can you tell from the background of the painting? Look at the colors. Look at the right side at the large circular shape—what do you think that is?
- When you look at the colors used, how do you feel or what do you think?
- Does the man look panicked? Why is he swimming when there’s a boat so close by?
- Is this an abstract or realistic painting?
- The name of the painting is Open Channel. What does that mean? What is a channel? Using a map, can you find a channel in America?

**Activities:**
Read the label information. What medium was used to create this artwork? Is it a painting or a print?

- Take a trip to the RedLine print studio or have someone come to your classroom to demonstrate how to make an aquatint.
  [http://www.redlineartmke.org](http://www.redlineartmke.org)

**Background Information**
_Aquatint is an intaglio printmaking technique, a variant of etching. Intaglio printmaking makes marks on a copper or zinc plate that holds ink. The inked plate is passed through a printing press together with a sheet of paper, transferring the ink to the paper. This can be repeated a number of times, depending on the particular technique._

_Like etching, aquatint uses acid to make the marks in the metal plate. Where the engraving technique uses a needle to make lines that print in black, aquatint uses powdered rosin to create a tonal effect. The rosin is acid resistant and typically adhered to the plate by controlled heating. The tonal variation is controlled by the level of acid exposure over large areas, and thus the image is shaped by large sections at a time._


To find out more about etchings, go to page 63 and see the section about the artwork _Weymouth Bay_, attributed to Maxime Lalanne.
Discuss the water cycle, rain, storms, and other weather conditions that would affect someone boating or swimming in open water.

Discuss water safety. Notice that there is no life jacket in the boat. The person is boating alone. If it is night, is that a good idea? Make charts about boating safety. Have a guest from the Milwaukee Yacht Club come speak about boat safety (what to do in a storm, etc.).

Divide into groups and have kids do a storytelling activity where (as a group) they make up a story about the picture. Group members would be assigned to do the beginning, the middle, and the end of the story and present it to the class.

_Vedute Delle Cascatelle A Tivoli_ by Giovanni Battista Piranesi

**Discussion:**

- Look at this wonderful landscape. If you could be in this picture, where would you put yourself? Tell a story about your day here. How did you get here? Are you alone or with someone? Who? What happens while you are here?
- What do you notice about the landscape here? What do you notice about the water in the waterfalls? What direction is it flowing? Have you ever seen water flow UP? What happens when the water hits the bottom? Does it keep flowing smoothly on? Why do you think that happens?
- Talk about gravity. Talk about how water naturally moves and flows downhill.

**Activities:**

- Look at the title of this etching—_Vedute Delle Cascatelle A Tivoli_. It is Italian. Can you guess what it means? Use an Italian dictionary or Google Translate to translate the title into English. Learn to say “waterfall” in Italian.
- Discuss Roman aqueducts and how they worked. Talk about how some ancient civilizations actually had running water. Read about the ancient Romans and their baths, aqueducts, and toilets. Draw a diagram of how the water flowed to (and through) their houses.
- Do a report on aqueducts and then build a model of one.
Philip Guston
American, 1913 - 1980
Sea, 1980
Lithograph
30 ½ x 40 ½ in
77.47 x 102.87 cm
2010.28.1
Museum purchase with funds from Nancy and Robert Sobczak
by exchange
Collection of the Haggerty Museum of Art, Marquette University

Sea by Philip Guston
Discussion:
- What do you think this picture is about?
- Where is the water? What is in the water?
- How do you feel when you look at this picture? Is it happy, sad, funny . . .?
- Look at the water. Can you see a reflection? One of the special properties of water is that it reflects.
- Do you see motion in this picture or do you see something that is still? How has the artist made you think that?
- Is there any energy being shown here?
- Tell a story about what you see here.
- What properties of water are evident in this picture? (Water is in motion, water reflects, things float in water, water can cool things or heat things.) Can you think of more?

Activities:
- Play water bingo from vocabulary words and activities. www.aquarion.com
- Experiment with different media and techniques to create the illusion of water in art (watercolor, monoprints, embossing, tissue, Impressionist techniques/pointillism, collage, etc.).
- Select artworks that have water in them and have students connect the art to stories or poems.
- Read and discuss the poems Waterfall at Lu-shan by Li Po and Clouds by Aileen Fisher. Connect them to weather and cloud studies. Create a cloud chart and keep a daily weather chart of clouds each day. (Use the Water is Life, Water is Poetry Seminar instructions at www.water.org.)
- Use the musical River Child: Legends of the Great Rivers of the World from Hal Leonard's Expressive Arts series to travel the world's great rivers. Perform the musical, create costumes and sets, and locate the places mentioned in the songs on a world map.
- List as many songs as you can that have water in their titles or verses, and then have a conversation using only the titles to the songs.
- Spread open a coffee filter on a table and place a quarter in the center. Draw a circle around the quarter with a green water-soluble marker. Set the filter over the mouth of a glass of water. Dip your finger into the water, then touch the center of the circle with your
wet fingertip. Watch what happens to the ink on the filter. The pigment of the dried ink dissolves in water and then is absorbed by and moves through the filter paper. Different pigments have different amounts of attraction to the filter paper. The color with the least attraction moves a greater distance through the paper.

Water and Food

![Image](image_url)

**Untitled (Apple and Worm) by Alexis Rockman**

**Discussion:**
Where is the water in this artwork? Although it is not always obvious, there is water in every living thing on Earth. Plants and animals depend on one another for survival. Their “bodily” functions actually depend on one another, and all life depends on water.

How do the animals in this painting depend on the plants? The butterfly eats the leaves on the plants for nourishment. It lays its eggs on the leaves and when the eggs hatch, the caterpillars eat the leaves also. The worm is eating the apple.

How does the water cycle play a part in the plant and animal world? What happens when plants and animals don’t get enough water? Where does the water that is contained in the plants and animals come from? How do the plants and animals use the water? Where does it go when they are finished with it?

Name the animals you can see in this painting. Name the plants you can see.
Activities:

- Chart water usage in your home and explain how it could be recycled through greywater. Do the Water has many uses Family Questionnaire (www.water.org) listing water use in your own family. Create a collage showing how people use water and share it with your class.
- Chart water usage for a week and create a spreadsheet to show your data. What conclusions can you draw from the data collected? How much water was used up totally (for drinking, cooking, etc.)? How much water was used marginally (for boating, fishing, swimming, skiing, etc.)? Make informative and attractive graphs/charts to show your findings.
- Compare the amount of water that goes into growing food (irrigation of plants) to the amount of food we get in the end.
- Compare the amount of water that is in food to the amount of everything else in food. Measure out two servings of some dried or dehydrated fruit or another dehydrated substance. Rehydrate one of the servings by soaking or cooking it in water, then compare how much more mass has been added by weighing and comparing to the original mass. Another way to compare is to use a balance and see how many of the dried portions will balance out one rehydrated portion.
- Discuss the purpose of rain barrels in conserving water. Let your class design and paint its own rain barrels, or have a contest to create the best design and use the best one to paint a rain barrel.

What is a Rain Barrel?
A rain barrel is used to collect rainwater before the rain returns to the earth, a watershed, or to a storm water system. Throughout history, falling rain has been collected and saved in temporary storage containers called rain barrels—even if they are not barrel-shaped. Today rain flows off the roof into a gutter, then into a downspout. The downspout is trimmed from the bottom to accommodate a rain barrel beneath it.

History of Rain Barrels
Rainwater collection can be traced back about 3,000 years. The earliest rain collector may have been made by hollowing out a coconut. Hunting-and-gathering tribes would often gather dewdrops each day to sustain life. By the time of the Roman Empire, communal water collection had become commonplace and individual rainwater collection systems had gone by the wayside.

Return of the Rain Barrel
Recently, dwindling fresh water supplies in some parts of our country have caused people to look at the use of rain barrels again as part of a solution to this problem. Rainwater collected in a rain barrel can be applied directly to lawns and flower gardens. You may also safely use your untreated rain barrel water for houseplants, laundry, swimming pools, washing walls and floors, and washing your car. According to the United States Environmental Protection Agency, or EPA, you can save about 1,300 gallons of water in a single summer by using a rain barrel to help you conserve water. http://www.livestrong.com/article/176743-what-is-a-rain-barrel

- What is the difference between greywater and blackwater? Greywater gets its name from its cloudy appearance and from its status as being between fresh, potable/drinkable water (known as “white water”) and sewage water (“blackwater”). In a household context, greywater is the leftover water from baths, showers, sinks, and washing machines only. Any water containing human waste is considered blackwater.
• Discuss and research rain gardens. What are they? How can they help the environment? Visit one and see if it is serving the purpose it was meant to.
• Research green roofs and do a report and/or make a model of one. Take a field trip to the Milwaukee Public Museum to visit their green roof.
• Green roofs supposedly hold up to 900,000 gallons of water after a storm. They slow down and reduce water runoff. They will reduce the uncomfortable effects of urban heat islands and provide insulation, which reduces energy.
• Visit the College of Agricultural Sciences/Penn State University’s Rain Gardens website for more information about rain gardens and creating rain gardens. [Link](http://ecosystems.psu.edu/youth/sftrc/lesson-plans/water/k-5/rain-garden-2)
• Research rain gardens and make your own conclusions about whether they are practical and useful.

**Lesson Plan:**
Water, Water, Everywhere – two 30- to 45-minute periods are used to help us appreciate how little water is actually available for human use. Discuss how humans use water and conservation ideas. National Wildlife Federation website: [Link](http://www.nwf.org/~media/PDFs/Be%20Out%20There/Schoolyard%20Habitats/WaterWaterEverywhere-NWF2011.ashx)

**Kapok Tree by Alexis Rockman**

**Discussion:**
Look at this painting of a Kapok tree by Alexis Rockman. Why would a picture of a Kapok tree be included in a unit on water?
Kapok trees are dependent on water. They live in the rainforest. Look closely at the picture. What animals can you see? The Kapok tree is home to many animals (and other plants) in the rainforest.

The fibers inside of the kapok fruit are water-repellent, have a low density and good buoyancy, and are used for filling life jackets and life belts. Until the middle of the 1900s, nearly every stuffed life preserver and upholstered automobile seat was filled with kapok fibers. Because the unopened fruit won’t sink when submerged in water, many believe the fruit of the kapok tree floated its way from Latin America to Africa.

The tree’s crown has an open umbrella shape. Many plants and animals grow and live in the branches of the kapok tree. Birds nest in it, and mammals use the huge branches as highways. Frogs breed in the pools of water that collect in the bromeliads (tropical plants with fleshy leaves that depend on other plants for physical support and grow on them) that live on the Kapok tree. The leaves of the bromeliads form funnels that hold water where small animals can live, or gather to get their drinking water.

Look very carefully. Do you see anything unusual about this picture? It is painted from a “worm’s eye view.” We are actually looking from the bottom of the tree straight up to the top!

Talk about perspective. Perspective is a point of view also referring to the relationship of one object in respect to another object. A worm’s eye view would be a view of an object as seen from the eye of a worm or very low to the ground. A bird’s eye view would be from a bird’s point of view—up in the sky looking down. On the other hand, one-point or two-point perspective refers to a graphic representation of where an object is seen in space in relationship to other objects. Which perspective/point of view are we using in this painting?

What do you see at the top of the painting?

Can you see any water? Why do you think this picture is included? The Kapok tree grows in the rainforest. That means that the area receives 50–250 inches of rainfall a year. That’s a lot of water! The Kapok tree is home to many animals in the forest and has a symbiotic relationship to other plants as well.

Activities:
- Talk about how plants and animals rely on one another, especially in the rainforest—predators and prey alike rely on the Kapok tree. Read The Great Kapok Tree by Lynne Cherry and Jan Brett’s The Umbrella. Both are about the rainforest, the kapok tree, and its relationship to other animals and plants in the rainforest.
- Explain the water cycle. Create a water cycle wheel using the template from the Illinois Environmental Protection Agency website: http://www.epa.state.il.us/kids/fun-stuff/water-cycle/wheel-instruct.html. Have students use their water cycle wheels to explain the cycle to their classmates.
- Create a water cycle bracelet from leather string and plastic beads. The beads represent the parts of the water cycle. Blue is first and represents groundwater, next comes clear or white to represent the evaporation process, then red to represent condensation in the clouds, then green representing precipitation back to the ground, completing the water cycle. Correct bead placement is important.
• Talk about water content (% of water in each) of animals, plants, and people’s bodies and how we all need water.
• Talk about the movement of water naturally—how does it get around inside plants? How does it go from stream to river and so on until it gets to the ocean?
• How does water get from the roots to the leaves of plants? Water travels through plants by capillary action. Explain capillary action using a chart you make.
• Talk about perspective and do a perspective drawing (one-point).
• Talk about bird’s eye, worm’s eye, fish’s eye views and draw pictures from those views. Draw the Kapok tree from the view of one of the animals that relies on it for life (monkey, frog, tiger, etc.).
• Make a book about the Kapok tree from the point of view of the animals that rely on it. Tell the story from the animals’/plants’ points of view.

Lesson Plan:
• The Incredible Journey from the Dublin San Ramon Services District in Dublin, CA www.drsrd.com. This is a lesson and game/activity illustrating the water cycle.

Rock by a Pool by Lilla Cabot Perry

Discussion:
Compare Kapok Tree and Rock by a Pool

Compare this Lilla Cabot Perry painting with the Rockman painting Kapok Tree. How are they the same? How are they different? Where is the water in each?

Moss
Explain how water is used in the moss plant as compared to plants with leaves. Mosses are in a class of small, simple, green plants. They have no internal water transport system. Unlike leafy plants, they do not have veins to transport water and food. Instead, all parts of the plant are used to absorb water and nutrients. Consequently, mosses are found mostly in places where there is a consistent supply of water.
Mosses have rhizoids instead of roots. While the rhizoids can absorb water, they are mainly used to anchor the plant. Moss plants absorb many times their weight in moisture; they soak up rainfall on hillsides, helping to prevent erosion. The soil-building and moisture-conserving work of the mosses is indirectly of great importance to humans.

You might find moss in your own backyard or in a moist area. Kapok trees can be found in the rainforests in Africa and South America. Pinpoint the places on a map where you might find each kind of landscape. Do you think you could find both in the same environment?

**Discussion:**
- How are the people in this print using the water?
- What is happening in this picture? Why?
- Can you see other boats? What do you think they are doing?
- What do you think the climate is here? How can you tell?
- What is the man on the dock doing? Why does he have that large plant? What does barter mean?
- How are the boats powered? Do you think this is a modern picture or an older picture and how can you tell?
- Do you see other evidence of water? How are clouds water?
- What role do clouds play in the lives of these people?

**Activities:**
- Learn a spiritual or other song that people may sing on the river (“The Erie Canal Song,” “Swanee River”).
- Write a story about what’s happening in the picture.
- Write about the daily life of the people in this print as if you were one of them. Is it a hard life?
**Discussion:**
- How is water used in this picture?
- Where can you see water in this picture?
- How does the fish use water? How do people use the water?
- Is this a realistic or abstract painting? How can you tell?
- Describe the picture in your own words. Why is the fish so far from the water? How does this fish relate to the overall image?
- What colors are used in this picture? Are they mostly warm or cool colors? How would the mood change if it were done in warm colors?

**Casein paint**
The medium used in creating this picture is casein. What is casein? Casein paint comes from casein, the protein that is in milk. It is a fast-drying, water-soluble medium used by artists. It generally has a glue-like consistency, but can be thinned with water. It can be used on canvas panels, illustration boards, paper, wood, and Masonite. The dried paint film is inflexible and brittle and not appropriate for backings such as canvas.

Casein paint, which has been used since ancient Egyptian times, is still used today like tempera paint. One of its qualities that artists value is that it dries to an even consistency, making it ideal for murals. It also resembles oil painting more than most other water-based paints. It is also good for underpainting.

**Activities:**
- Create a recipe for fish using this image for inspiration.
- Make casein paint and use it to paint a picture (adult supervision required).

**Making Casein Paint**
A quick way to make some casein painting medium is to begin with skim milk cottage cheese. Wash off any of the milky fluids. Lumps of casein are left behind and should be dissolved in water and a bit of ammonium carbonate in a pot. Stir the mixture while it warms until it begins to froth and the lumps dissolve. Do not boil. Keep simmering and stirring until the frothing stops. When this “syrup” is cooled, what you have left is the medium. If you want a color, you must add pigment. It keeps in a refrigerator for about four days.
• Research how Egyptians used casein paint. Create Egyptian-style paintings using casein paint.
• Write a story about this picture.

*Tim Ebner*
American, b. 1953
*Untitled (Wolf, Alligator and Fish)*, 1997
Oil on canvas
48 x 42 in
121.92 x 106.68 cm
2000.10.7
Gift of Eileen and Peter Norton
Collection of the Haggerty Museum of Art, Marquette University

*Untitled (Wolf, Alligator and Fish) by Tim Ebner*

**Discussion:**
- What is going on in this picture? (Encourage storytelling.)
- What animals are these?
- Look at the hands/paws. Who do they belong to?
- Is there anything unusual about these animals?
- How does this painting relate to water?

**Activities:**
- Talk about how people, animals, and plants use water.
- Talk about how water is used for recreation, for living in, for maintaining our bodies’ health.
- Write a story (maybe a fable or fairy tale) about this picture.
- Create imaginary animals in art (painting or sculpture).
- Talk about the cycle of life (predators and prey).
- Discuss how animals use the water for their food source. How are things different for animals that live in the water compared to animals that live on the land?
Kajikazawa in Kai Province by Katsushika Hokusai and The Mending of the Trout Net by Robert Von Neumann

Discussion:
- Compare these two artworks. How are they alike? How are they different?
- Does it look like the fishermen have a hard life? Which artwork illustrates that best?
- The Von Neumann painting is called The Mending of the Trout Net. Where do you think they are fishing? Where are the Japanese fishing? What clues do you have? Which one do you like the best?
- Which one is more realistic?

Activities:
- Create your own fishing scene. Use painting or create a print.
- Try to imitate the style that Hokusai used. Remember to make a cartouche with your name in it. Try to find how to write your name in Japanese.
- Create postcards in the Japanese print style and send to someone you know—add the cartouche for your name in a red box like the Japanese do.
Water from the Lake to Your Home and Back

Activities:

- List the ways we use water every day (not just for drinking). See how many you can come up with.
- Conservation—how can we conserve water? What are some simple ways you can conserve water in your home? (Turn off the water while you brush your teeth. Keep water in the refrigerator so you don’t have to let the water in the sink run until cold.) How many can you think of? Use the Activities sheet with different activities and how much water is used for each from the Aquarion water website. www.aquarion.com
- Discuss rain gardens and make one for your school. http://uwarboretum.org/eps/research_act_classroom/rain_garden_curriculum.php
- Explain the trip water takes from the lake to our house and back to the lake again. Use diagrams or drawings to illustrate the trip. What happens? Use the leaflet from Milwaukee Water Works to explain the process. http://city.milwaukee.gov/water
- What is the water cycle? Draw a picture or find a chart that shows the water cycle and explain the process to your class or create a bulletin board display http://www.kidzone.ws/water, http://ga.water.usgs.gov/edu/watercycleplacemat.html
- Explain the connection between sewage disposal, sanitation, and the deep tunnel project in Milwaukee. Is the deep tunnel project effective? Why or why not? http://v3.mmsd.com/deeptunnelhowitworks.aspx
- Discuss the wastewater cleaning process. Look at the Milwaukee Metropolitan Sewerage District website above.

Lesson Plan:
How do we get water to everyone who needs it? Consult: Excuse Me, Is This the Way to the Drainpipe? http://www.epa.gov/region1/students/pdfs/ww_drain.pdf
Water: Science and Technology

Landscape #2 by Steve Davis

Background Information on Landscape #2

Over the course of a three-year period, Steve Davis travelled to American Falls, ID, documenting the small town where he grew up. By returning repeatedly throughout the different seasons of the year, Davis was able to capture the spirit and struggle of a rural community bound by big agriculture and a changing way of life.

Overlooking southeastern Idaho’s Snake River—tamed and fattened by a massive dam—American Falls seems to be dying a death that is as slow as it is unspectacular. The local businesses of the past are all but gone. Agriculture, the primary source of the town’s economy, has also felt the bite of encroaching corporations. Family farms that made Idaho famous for their potatoes are disappearing in favor of giant farms controlled by international conglomerates. A future coal gasification plant for fertilizer production is seen by many as the town’s best hope.

Steve Davis moved to Idaho when he was ten. He states “(The joke is) none of my family members who chose to stay in Idaho got out alive. The economy, agricultural pollution, the wind and the cold make this town a place not for the weak or faint hearted. In spite of the challenges that face American Falls, people make lots of babies. They go to churches, go to bars, and many, while still young and independent, just go; as did the town’s namesake—destroyed by the very dam that irrigates the crops that feed us.”

Steve Davis is the Coordinator of Photography and a faculty member at The Evergreen State College in Olympia, WA. His work has appeared in the New York Times Magazine; The 50 States Project; and is in the collections of the Museum of Fine Arts, Houston; George Eastman House; Tacoma Art Museum; and the Musée de la Photographie, Charleroi, Belgium.


Discussion:
- Look at this photo. What do you think this is?
The artist’s statement explains the dam is the thing has been killing the town over time. How can a dam kill a community? What is the purpose of a dam?

- Why does the artist call this a landscape? What is a landscape?
- What can you see if you look very closely? (You can see graffiti on the dam, a large retaining wall, and spalling [chipping, flaking, or scaling damage along its surface] concrete on the face of the dam and some spalled concrete that has fallen off the dam onto the ground in front. In the background there is water and sky.)
- The label says it is an archival inkjet print. What is that?

Activities:

- Research dams and do a report. Describe uses for dams and how dams can cause damage to the landscape and communities. What other options might a community have in place of a dam?
- Teach students to read art labels. Ask questions related to the labels. Have children create their own abstract picture about water and write their own labels.

Reading An Art Label

Line one: Artist’s name

Line two: Country of origin, birth and death dates

Line three: Title of artwork and date completed

Line four: Art medium used

Line five: Size of artwork

Line six: Accession number (identification number assigned to an artwork by a museum)

Line seven: How the artwork was acquired by the museum

Depending on the museum or gallery, not all lines may be present. Lines 1, 2, 3 and 4 are nearly always present.

Water and Technology: Discussion of dams in relation to water and technology

A dam is a barrier that impounds water or underground streams. Dams generally serve the primary purpose of retaining water, while other structures such as floodgates or levees (also known as dikes) are used to manage or prevent water flow into specific land regions. Hydropower and pumped-storage hydroelectricity are often used in conjunction with dams to generate electricity. A dam can also be used to collect water or for storage of water which can be evenly distributed between locations.


<table>
<thead>
<tr>
<th>Function</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power generation</td>
<td>Hydroelectric power is a major source of electricity in the world. Many countries that have rivers with adequate water flow can be dammed for power-generation purposes.</td>
</tr>
</tbody>
</table>
Many urban areas of the world are supplied with water from rivers pent up behind low dams. Other major sources include deep upland reservoirs contained by high dams across deep valleys.

Dams are often used to control and stabilize water flow, often for agricultural purposes and irrigation. Others can help to stabilize or restore the water levels of inland lakes and seas.

Some dams are created for flood control.

Dams (often called dikes or levees in this context) are used to prevent water from coming into an area that would otherwise be submerged, allowing its recovery for human use.

A typically small dam used to divert water for irrigation, power generation, or other uses, with usually no other function. Occasionally, they are used to divert water to another drainage or reservoir to increase flow there and improve water use in that particular area.

Dams create deep reservoirs and can also vary the flow of water downstream. This can in return affect upstream and downstream navigation by altering the river's depth. Deeper water increases or creates freedom of movement for water vessels.

Dams built for any of the above purposes may find themselves displaced by time of their original uses. Nevertheless the local community may have come to enjoy the reservoir for recreational and aesthetic reasons. Often the reservoir will be placid and surrounded by greenery, and convey to visitors a natural sense of rest and relaxation.

Discussion:
- What is a fish ladder and why is it used?
- Explain how a dam works and reasons for using one.
Discussion:
- Read the title of this photograph. What do you think it means?
- What do you see in the sky?
- This takes place in Albuquerque, New Mexico. Why did the photographer show satellites in the sky?
- Do you think there were really satellites in the sky? How did the photographer put them there?
- Can you make up a story that tells about this photo?
- What do you know about New Mexico that would make the photographer put nuclear-powered vehicles and strategic-defense instruments in the sky? Locate New Mexico a map. What is the geography of this state like?
- What is the mood of this picture? Is it happy, sad, or something else? What makes you think that?
- How does water play a part in this picture? Look in the lower middle part of the picture. It is raining. There is a farm. How does this water/rain help/hurt the farm?

Activities:
- Explain the water (hydrologic) cycle. Create a chart to illustrate.
- Create a story about the images in this photo—who are the people? Why are there vehicles and weapons in the sky?
- Create a picture that is the opposite of the picture above.

*Ralph Steiner*
American, 1899 - 1986
*Mid Hudson Bridge, 1931 / 1979*
Gelatin silver print
9 1/2 x 7 1/2 in
24.2 x 19.1 cm
90.15.9
Gift of Therese and Murray Weiss
Collection of the Haggerty Museum of Art, Marquette University

*Mid Hudson Bridge* by Ralph Steiner

Discussion:
- Talk about perspective (one-point) and do some drawings using perspective.
  Perspective is a term used in art and graphic drawings to show depth in a picture by using a vanishing point (or points).
Talk about parallel lines. Parallel lines are lines that are equidistant from end to end. Are the sides of the bridge above parallel? Do they look parallel?

- Talk about symmetry. Symmetry means that something is the same on one side as it is on the other. Is the bridge in the photo symmetrical?
- Using the music CD Songs in the Key of Art, listen to “Symmetry (I’m Beside Myself)”; then learn the words to the song. Draw something that is symmetrical.
- Talk about technology, specifically bridges, and how they have evolved over history. Bridges started out as logs that fell over a body of water; humans eventually made bridges of stone, and finally concrete and steel.
- This is a suspension bridge. Discuss different types of bridges—why have they changed over time?
- How does this bridge affect the water below? How does it affect the birds and flying insects (and vice versa)?
- How have bridges affected civilizations?

Activities:
- Find examples of other kinds of bridges and do a report/chart about bridges.
- Build a bridge using K'NEX or some other building toy.

Lesson Plan:
Where to Build a Bridge from the Denver Art Museum based on Monet’s artwork, Waterloo Bridge.

Water and Pollution

Jennifer Bartlett
American, b. 1941
East, West, 2009
Lincoln Center for the Arts, New York City (Publisher), Brand X Editions, Ltd. (Printer)
Color screenprint
43 1/2 x 80 in
110.49 x 203.2 cm
T2010.2.3
Promised gift of Mary and Michael J. Tatalovich
Collection of the Haggerty Museum of Art, Marquette University

East, West by Jennifer Bartlett

Discussion:
Since the early 1970s, Jennifer Bartlett has focused primarily on grid-based interpretations of environmental subjects. Bartlett’s work is best recognized by her frequent inclusions of colorful plaid patterns and a consistent interest in elements of her landscape, although her imagery has become increasingly varied. She currently lives and works in New York City. Bartlett’s pieces tell a story. Her early works evolved from self-set problems or puzzles.

- What is the subject of this artwork?
- What is unusual about it?
Bartlett’s work is characterized by her use of grids. What is a grid? How has a grid been used on this artwork?

What is a screenprint? Is water used to make a screenprint? Describe the process.

Make a screenprint with water as your subject.

Swamp and Pipeline, Giesmart, Louisiana by Richard Misrach

Background Information
Chromogenic color prints are full-color photographic prints made using chromogenic materials and processes. These prints may be produced from an original which is a color negative, slide, or digital image. The chromogenic print process was nearly synonymous with the twentieth-century color snapshot. It is the most common type of color photographic printing.

“Revisiting the South: Richard Misrach’s Cancer Alley”
In 1998 the High Museum of Art in Atlanta, GA, commissioned photographer Richard Misrach to create a body of work as part of the Museum’s “Picturing the South” series. Misrach chose to develop a study on the ecological degradation of a passage of the Mississippi River between Baton Rouge and New Orleans that is sometimes referred to as “Cancer Alley.” Like the Western landscapes for which Misrach is best known, these photographs challenge viewers with environmental and political concerns while seducing them with evocative and lyrically beautiful large-scale prints.

http://atlantaplanit.com/events/event.php?eid=47290

Discussion:
• Look at Richard Misrach’s photo. What do you see?
• What do you think this picture is about?
• Why do you think the pipe was put here?
• How does this affect nature/water?
• The image was part of an exhibition called Revisiting the South: Richard Misrach’s Cancer Alley. Does this give you some kind of clue as to what is wrong with this pipeline?
Background Information

Cancer Alley is an area along the Mississippi River between Baton Rouge and New Orleans, in the River Parishes of Louisiana, that contains numerous industrial plants. Locations in this area that have clusters of cancer patients have been covered by the media, leading to the “Cancer Alley” moniker.

In 1987, some residents in the tiny community of St. Gabriel, LA, called Jacobs Drive, the street on which they lived, “cancer alley” because of 15 cancer cases that occurred in a two-block stretch. Half a mile away, there were seven cancer victims living on one block. The 85-mile stretch of the Mississippi River from Baton Rouge to New Orleans was formerly referred to as the “petrochemical corridor” but, after media coverage of cancer victims in the small rural communities on both sides of the river, the entire area became known as Cancer Alley. In 2002 Louisiana had the second-highest death rate from cancer in the United States.

Louisiana, which has a population of 4,469,970 people, produced 9,416,598,055 pounds of waste in 2000. Seven of the 10 plants in the state with the largest combined on-site and off-site releases are located in Cancer Alley, and four of the 10 plants with the largest on-site releases in the state are located there.

http://en.wikipedia.org/wiki/Cancer_Alley

Occidental #26, Niagara Falls, NY by John Pfahl

Background Information

In his series Smoke, Pfahl photographs the display of smoke from the Bethlehem Steel coke operation in Lackawanna, NY. It is a truly awesome spectacle of nature, like an erupting volcano or a cataract, ever expanding and changing in form, an abstract phantasmagoria of light and color.

http://www.ellencurleegallery.com/gallery/main.php?q2_itemId=1543
Discussion:

- How is water shown in this photo?
- Is smoke all just waste material?
- We often look at smoke and think immediately that it is pollution. Is smoke always pollution? How does smoke like this affect our environment?
- What is a steel coke plant?
- What happens to the pollutants in smoke when they are released into the air? Where do they go?
- Do some research on coke plant operations. What do they do? Is there a problem with pollution? Is the smoke the biggest pollution problem or do these plants pollute in other ways?
- What are the implications of this type of pollution on our natural environment? Do pollutants enter our water? Is this a problem?

River Scene-Eads Bridge by James Baare Turnbull

Discussion:

- Look at the subject of this artwork. Describe what you see.
- Notice that the industry is right on the water. Why do you think the industry is so close to the water?
- How does the close proximity of industry to water affect the water?
- Early cities developed on waterways as that was the best way for people and products to easily and quickly get from place to place. Because early factories and civilizations in general disposed of their waste in the adjacent waterways, rivers were dubbed “nature’s sewers.”
- How is technology represented in this artwork?
- How have we as a society learned to deal with this pollution?
- Why is it important to keep our waterways clean?
- What can you see at the base of the hill just above the water/beach area? How are trains/railroads used in industry?
- Look at the sky. What colors are used in the sky and why?
- Talk about placement of water sources, upriver/downriver, sewage treatment facilities, etc., and why we place them where we do.
Lesson Plan:
Do The Same Old Water lesson plan from EekoWorld [pbskids.org/eekoworld](http://pbskids.org/eekoworld) on ways to clean dirty water.

Activities:
- List ways we can help to keep our water clean.
- Make a chart showing percentages of fresh water and saltwater on the earth.
- Research the process of turning saltwater into fresh water and write a report or create a chart or picture that shows how it is done. Why is it not done more often?
- Look at the river scene above and create a painting that shows the same scene after the pollution has been cleaned up.

![Image of water and pollution](image)

**Edward Burtynsky**
Canadian, b. 1955

*SOCAR Oil Field #1 a&b, Baku Azerbaijan*, 2006
Digital chromogenic color print
40 x 60 in
101.6 x 152.4 cm
2009.31
Museum purchase with funds from Mrs. Martha W. Smith by exchange
Collection of the Haggerty Museum of Art, Marquette University

**SOCAR Oil Field #1 a&b, Baku Azerbaijan** by Edward Burtynsky

**Activities (can be used with any of the Water and Pollution images):**

*East, West* by Jennifer Bartlett
*Swamp and Pipeline, Giesmart, Louisiana* by Richard Misrach
*Occidental #26, Niagara Falls, NY* by John Pfahl
*River Scene-Eads Bridge* by James Baare Turnbull

**SOCAR Oil Field #1 a&b, Baku Azerbaijan** by Edward Burtynsky

- Clean water using various filtering media—do it in steps to see what comes out in each step. Try evaporating a sample from each cleaning to compare what was cleaned out each time. Note that it takes energy to clean water. We don’t really run out of water, we just make it unusable for reuse before cleaning.
- Clean water with a paper towel, scissors, a funnel, clean sand, two clear glasses or jars, a spoon, water, and dirt from the backyard. [www.mcwa.com](http://www.mcwa.com)
- Look up permeability at the What Trickles Down? Design your own experiments on permeability—porosity, permeability, sediment, runoff. [www.TeachEngineering.org](http://www.TeachEngineering.org)
- Create a critter scope (from the Darby Duck website at www.epa.gov) and look at what's in water. Draw what you see.
- Use riddles about the environmental, social, and economic impacts of water privatization. www.devp.org
- Use the webquest about global crisis awareness (“Water is Life” Global Water Awareness Mini-Unit) or the Water-Aware Portfolio webquest (both from www.water.org).
- Set up a microscope and look at water drops. Draw what you see, then create a painting from your sketch.
- Identify pollutants in water specifically in your area as opposed to an agricultural area. How and why are they different?
- Explain how pollutants get into the water.
- Collect water samples from a water source and ask kids to hold the sample up to the light and describe how it looks. Is anything floating in the water? How does it smell? Record your observations.
- Create a photography show of water shots taken in your neighborhood.
- Do the Thirstin Builds an Aquifer activity from the U.S. Environmental Protection Agency Office of Water website (www.epa.gov/safewater). Build your own aquifer using a clear plastic cup, modeling clay, sand, aquarium gravel, red food coloring, a bucket of clean water and a small cup. Discuss how groundwater can become contaminated and how that ends up in our drinking water source. This is a good whole class activity.
- Use the Dirty Water, So What? Lesson Plan from thewaterproject.org website. Use the jigsaw approach. Divide the class into groups and read stories about problems with pollution/dirty water. Then have them teach one another. There is a quiz at the end. Additional ideas: create a public service announcement video, a 30-second newscast, a debate, or write a story about a family that experiences the effects of dirty water. One billion people don’t have clean, safe water.
- Do the Aquarion filter in a bottle activity (www.aquarion.com). Filter water using a two-liter bottle, screening, rubber bands, a container for dirty water, charcoal, sand, pebbles, plastic bags, and materials to make dirty water. This could be a classroom or special teacher presentation.
- From the U.S. EPA website (www.epa.gov), use the Darby Duck the Aquatic Crusader No Water off a Duck’s Back or Sink or Swim? activities. Show how pollutants such as oil affect animals like ducks and how we can prevent such problems.
- Talk about the water cycle. How does nature clean water? Is nature more efficient than we are? Explain the parts that the sun, gravity, and dirt play in the filtering of water into groundwater.
- Fountains are not only for beauty. How are fountains used in the purification process?

Lesson Plans:
- Use Earth Force GREEN (Global Rivers Environmental Education Network)’s Watershed Model Activity (www.earthforce.org/GREEN). Supplies needed for this outside activity are: two plastic picnic table covers or tarps, five spray bottles filled with water halfway, plastic bags, newspapers, and assorted items to create landscape and pollutants such as: brown cake sprinkles, cocoa powder, green food coloring, honey, dish soap, red food coloring, cooking spray, string, sponges, green felt, small plastic fences, and paper towels.
- Do the Excuse Me, Is This The Way To the Drainpipe? activity. Explains where drinking water comes from and where wastewater goes once it leaves the home. Explains how
water we use fits into the water cycle. Mostly a story and a discussion. Needed are copies of the activity story, and crayons, or paper and art supplies. www.epa.gov

- Do the Freddy the Fish mini-unit activity about pollution and conservation from http://pan.intrasun.tcnj.edu/501/projects/Cruz/water_pollution.htm

DAY ONE: Tell the story of Freddy the Fish and add pollutants to the water and to see what happens to the water and Freddy. Supplies needed are: two soda bottles, two fish-shaped sponges, two strings, two washers, small amounts of soil, pancake syrup, salt, paper dots, brown sugar, soapy water, and red and green food coloring.

DAY TWO: Use the same website to demonstrate how pollutants can get into our water supply and how to keep water clean. Supplies needed are: three aluminum pans, three spray bottles filled with water, three sheets of white paper with a blue stripe down the center, and different colored spots made with washable markers. Use The Magic School Bus At the Waterworks book, written by Joanna Cole and illustrated by Bruce Degan.

DAY THREE: Using a saltwater/fresh water poster that lists statistics on how much water activities use, become aware that the amount of water that exists on Earth is not unlimited. Stress the importance of conservation. Supplies needed are: 18 globes or world maps, 97 pieces of uncooked ziti dyed or painted blue with one piece dyed red and two pieces dyed green, food coloring, a gallon of water, Dixie cups, and little salt packets.

- Using the Utah State University Extension’s Water Quality website (http://extension.usu.edu/waterquality), do the Water Pollution Graphing activity to identify a link between land use and watershed and water quality. Students will evaluate the quality of a water sample (a bag of Skittles), graph their results, and form a hypothesis about the land use near the location their sample was collected. Needed supplies for this activity are: Skittles, plastic sandwich bags, graph paper, colored pencils or crayons, pollutant labels, and pictures of land uses. Divide Skittles into bags (different amounts/colors in each bag—colors represent pollutants). Each group gets a water sample to graph the pollutants. Identify what activities are happening in their watershed to create the pollutants.

Watershed: an area of land from which all the water drains to the same location, such as a stream, pond, lake, river, wetland, or estuary. A watershed can be large or very small. Large watersheds are often called basins and contain many small watersheds. Watersheds can transport nonpoint source pollution. (Nonpoint source pollution is associated with rainfall and snowmelt moving over or through the ground, carrying natural and human-made pollutants into water sources, such as fertilizers, pesticides, sediment, gas, and oil.) Pollutants accumulate in watersheds as a result of various human and natural activities. These pollutants, while sometimes inevitable, drastically alter the state of the ecosystem.

- Do the “Mock Muck”: A Water Treatment Simulation mini-unit from www.water.org. Mix up mock muck and develop strategies to create the most effective filtration/treatment system with the materials provided. Using data worksheets, do the water aware fact puzzle.

- Do the Drinking Water Mystery: A Simple Test activity (with resources added) from the Fairmount Water Works Interpretive Center, sponsored by the Philadelphia Water Department. Test different water samples for drinking quality and pollution. www.fairmountwaterworks.org

- Do the water cycle games from EekoWorld. Use the Internet sites and videos to play games and answer questions. These games are actually more about pollution and conservation than the water cycle. www.pbskids.org/eekoworld
The Power of Water/Weather

Driving Rain at Shuno (no. 46) from 53 Stations of the Tokaido Road
by Utagawa Hiroshige

Discussion for the following artworks:
- Driving Rain at Shuno (no. 46) from 53 Stations of the Tokaido Road by Utagawa Hiroshige
- Barbara Morgan Sketching in Grand Canyon by Willard Morgan
- The Arms of Undertow by John D’Agostino
- Sturm wolken Uber Cape Cod (Storm Clouds Over Cape Cod) by George Grosz
- Wave by Robert Longo
- Untitled (Clouds, Oaxaca), Dark Cloud with “Claws” Reaching toward Mountains, Peacock Tail (Peacock Feathers) by Ralph Steiner
- Weymouth Bay by Maxime Lalanne
- Three Cascades, Union River, Porcupine Mountain State Park, Michigan, October 16, 1972 by Tom Uttech

Water has the ability to do work or make changes. Look at these pictures. Can you see evidence of what the power of water can do?

Water has power in nature when it moves or changes. Waterpower can be harnessed by humans. In order to control waterpower, humans need to modify nature. What evidence is there that humans have done something to harness water’s power?

Are there consequences of using waterpower that we might want to avoid? (Damming rivers has consequences—what are they? Go back to the section on Steve Davis’s photographs of American Falls and discuss.) What are some other things that might happen when we try to change nature to use the power of water?

Discussion:
- Does water have power or energy on its own, or does it get that energy from somewhere else?
- Does water still have energy even if it does not move? (This could lead to discussions of potential and kinetic energy.)
• What do you think is easier to use: water energy, wind energy, or energy from other
  moving things?
• What kinds of moving things do you see in your lives that have energy?

Activities:
• Watch the video of a hydraulic press using water balloons to lift objects.
  http://www.youtube.com/watch?v=wxRJJs6nvDM
• Use water cannons/guns for cleaning. What else could a water gun be used for?
• Make a waterwheel.

What is erosion and is it good or bad? What are some consequences of erosion? How can/do
we try to control erosion?

General Activities:
• Study clouds and create a chart showing different types of clouds and what kind of
  weather they bring. Create art that shows these clouds and the accompanying weather.
• Keep a weather log of daily weather or a weather chart for your classroom.
• Make a rain gauge with a plastic bottle, a marker, aquarium gravel, and a scissors, from
  the Monroe County Water Authority website at:
  http://www.mcwa.com/MyWater/KidsWaterFun.aspx#gauge
• Find out about whirlpools and why they spin in a specific direction. Conduct related
  experiments.
• Make fog in a bottle. See: http://www.weatherwizkids.com
• Study the effects of weather disasters on the land (flooding, drought, etc.) and do a
  report or science fair project about them.
• Make snow art (paint the snow!) or other temporary, environmental art that would
  disappear as weather changes. See:
  http://giftedkids.about.com/od/nurturinggiftsandtalents/ht/snow_painting.htm
• Use the weather handouts to make your own frost, or see how water evaporates, and
  record graphing and charting results from http://www.sciencekids.co.nz/weather.html
• Discuss tornadoes and how they work. Create a chart or illustration that shows the
  process.
• Create a cloud in a jar from http://www.weatherwizkids.com
• Make a rain gauge from http://www.weatherwizkids.com
• Look at cloud formations and types of clouds and identify them. Create a chart showing
  the different types and the weather associated with them.
• Build a weather station. Collect data on charts for a month. Try predicting weather both
  from your data and from watching the weather forecasts on TV.
• Create a barometer and discuss water pressure from
  http://www.sciencekids.co.nz/weather.html
• Research and report on different weather phenomena (tornadoes, monsoons, cyclones,
  hurricanes, etc.).
• Create frost on a can from http://www.weatherwizkids.com
• Do an evaporation experiment.
• Do the water bottle trick.
• Which way do whirlpools spin? Turn on faucets in your house and flush toilets to see
  which way the water goes and chart it. Try the same experiment at a friend or relative’s
  house. Are results the same? (Discuss the Coriolis effect in which water spins
  counterclockwise in the Northern Hemisphere and clockwise in the Southern
Hemisphere. Although it doesn’t work well in home situations, it does work when talking about weather in general.

Lesson Plan:
- Use the Wear-Away and Wandering Water erosion activity for four or five groups of kids from Aquarion to illustrate erosion, obstacles, displacement, and runoff. Supplies needed are paper cups, paper towels, a metal roasting pan, a plastic tray, soil, and a one-gallon plastic jug filled with tap water. Create an erosion model and discuss the effects on the environment from erosion. A questionnaire is also available. [http://www.aquarion.com/pdfs/Wandering%20Water-%20Wear%20Away%20Water.pdf](http://www.aquarion.com/pdfs/Wandering%20Water-%20Wear%20Away%20Water.pdf)

Activities:
- Investigate tides, floods, drought, and sea monsters and how they relate to historic events or myths and stories.
- Read the poems *Fog* by Carl Sandburg and *One Misty, Moisty Morning*, a nursery rhyme, and discuss.
- Create a mini water cycle using a bowl, plastic wrap, a rubber band, a cup, and water, from the Monroe County Water Authority handout. [http://www.mcwa.com/MyWater/KidsWaterFun.aspx](http://www.mcwa.com/MyWater/KidsWaterFun.aspx)
- Make a water cycle bracelet with leather string and plastic beads. The beads represent different parts of the water cycle, so they must be made in sequence. [http://www.bainbridgeclass.com/watercyclebracelet.pdf](http://www.bainbridgeclass.com/watercyclebracelet.pdf)
- Make rain in a bag from [http://www.ehow.com/info_7902349_kindergarten-rain-activities.html](http://www.ehow.com/info_7902349_kindergarten-rain-activities.html)
- Make a classroom activity of creating a terrarium in a soda bottle from [http://www.aquarion.com/pdfs/THE%20RETURNING%20RAINDROP.pdf](http://www.aquarion.com/pdfs/THE%20RETURNING%20RAINDROP.pdf)
- Make a water cycle wheel from the Illinois EPA website. Illustrates the water cycle with a turning wheel game. [http://www.epa.state.il.us/kids/fun-stuff/water-cycle](http://www.epa.state.il.us/kids/fun-stuff/water-cycle)
- Create a plant in a bottle necklace. [http://plantsciences.montana.edu/horticulture/ASHS_Teaching_MethodsWG/Intro%20to%20Horticulture/Orvis_seed%20necklace%20activity.pdf](http://plantsciences.montana.edu/horticulture/ASHS_Teaching_MethodsWG/Intro%20to%20Horticulture/Orvis_seed%20necklace%20activity.pdf) (science/water cycle/craft)
- Describe drought. What is it? How does it affect the environment/the population/the existing water supply? Discuss how drought in the southern United States in the 1930s was connected to the Great Depression.

Lesson Plans:
- Do the Readers’ Theater Script: Water Cycle Adventure 10-minute play using 20 characters from the Enchanted Learning website. Could be done as a class activity and presented to other classes or as a culminating activity for the unit on water. [http://www.enchantedlearning.com/rt/weather/watercycle.shtml](http://www.enchantedlearning.com/rt/weather/watercycle.shtml)
- Do the 50-minute The Incredible Journey activity from the Dublin San Ramon Services District, Dublin, CA, website at [www.dsrnd.com](http://www.dsrnd.com) to demonstrate the complexity of the water cycle. The activity uses the whole class, then works in pairs, then the whole class again for conclusion by graphing and acting out the water cycle. To illustrate molecular level and activity, use the Round and Round the Water Cycle activity where pairs lock arms and stick close together. Go from station to station, (nine stations in all) and spin a spinner to find out where to go next. For instance, mark your location on your chart at the cloud station, then separate from your partner. Leaving the cloud station, take the person behind you as your new partner.
• Learn and sing the Water Cycle song to the tune of “Clementine.”
• Do The Case of the Disappearing Water evaporation in the water cycle activity with
  handouts found at http://www.epa.gov/region1/students/pdfs/ww_disap.pdf.
  Students can do this with their teachers using measuring cups and water. Hypothesize
  first. Check water levels daily. Record results and conclusions on charts or graphs. Work
  in small groups. Illustrates that water is continuously being heated and cooled—
  evaporating, condensing, freezing—depending on its environmental circumstances. In its
  never-ending cycle, it encounters and mixes with a variety of substances—some are
  pollutants. Pollution can result both from natural sources and human activities. Through
  the water cycle, nature provides a variety of mechanisms for cleaning water. Evaporation
  is a natural water cleanser. When water evaporates, it leaves most dissolved substances
  and waste materials behind. Pollutants can also be filtered out when water moves
  through soil. Some settle out in slow-moving water bodies. Nature even employs a host
  of microscopic organisms to help keep water clean.

Barbara Morgan Sketching in Grand Canyon by Willard Morgan

Discussion:
• Where is the water in this picture?
• Why does it look so small? Talk about perspective here.
• How many have been to the Grand Canyon? Isn’t it amazing? What’s really amazing is
  that that tiny river created that HUGE canyon. How? (Over years and years the water
  eroded away the rock and dug deeper into the ground to cause the canyon. The natural
  movement of the water created the canyon.)
• How long do you think it took to make this canyon? (Over a period of 18 million years. It
  must be some hard rock!)
• Talk about streams and their life cycle and how that changes them physically: old age,
  young, etc.

Activities:
• Do some activities to show erosion—in a sand table, on a sand creation, or by running
  water over the same area of dirt in the yard.
The Arms of Undertow by John D’Agostino

Discussion:
- This print is different from some of the others here. It is a digital print. How is this made?
- What is this image about? What is an undertow?
- Have a discussion about surfing and tsunamis.
- Discuss ocean tides.
- Are the colors in this print warm or cool?
- Is this a realistic image?
- How is this image a story of water? What else do you see in this image? What do you think the green is?
- What are the spots on the green area?

Activities:
- Using the computer and a photographic program, manipulate an image to look like this one.
- Using watercolor/acrylic paints, tissue paper, pencil erasers, and other textures, try to create an image similar to this one.
- Write a cinquain poem about the image. A cinquain has five lines. The first is a word that is the title or name. The second is two adjectives describing the title. The third is three action words. The fourth is two more descriptive words, and the fifth is a word meaning the same thing as the title (or a restatement of the title).
- Look at the title of the image and explain the word “undertow.” Does the definition help to understand the different colors and sections of this print?
George Grosz
German, 1893 - 1959

*Sturmwolken Uber Cape Cod (Storm Clouds Over Cape Cod)*, 1949
Lithograph
8 3/4 x 13 in
22.22 x 33.02 cm
82.11.1
Gift of Marvin and Janet Fishman
Collection of the Haggerty Museum of Art,
Marquette University

---

**Sturmwolken Uber Cape Cod (Storm Clouds Over Cape Cod) by George Grosz**

**Discussion:**

- Look this picture. Do you think this is a calm, still picture? How can you tell? Look at the lines the artist used.
- Look at that sky! What kind of weather do you think is happening here? Look at the grasses on the hillside—even they are made with short and wavy/curvy lines suggesting movement.
- Water moves naturally. It is seldom completely still in nature. It flows and as it flows, the water passes through rocks, etc., and helps to clean sediment and rocks, etc., out of the water. Discuss stagnant water and what that means.
- What time of year do you think it is in this picture? How can you tell? What are your clues?

**Activities:**

- If you were to make up sounds to go with this picture, what would they be? Would you hear the wind, splashing of waves, rustling of grasses, maybe sounds of people in the house? Can you make the sounds? Create a song or music to go with the picture.
- Notice that the title is written in German. Give the kids the title in German only and have them guess what the English title is from the way the German sounds. Learn some more words in German. What is “water” in German?
Wave by Robert Longo

Discussion:
- What do you see in this picture?
- What does it make you think about?
- Something interesting about water is that it is almost always in motion. In the oceans (and even on Lake Michigan and other large bodies of water) you will see waves like this. Talk about how water is affected by gravity and the tides are affected by the moon.
- Have you ever seen waves like this? Where? Did you know that Lake Michigan has waves big enough for people to surf on?

Activities:
- Make a wave table like you see at a water park. Observe what happens.
- Research waves. What causes them? Do a report on waves and tides with pictures and charts to accompany it.
Discussion:

- What kind of weather are these pictures showing? Talk about clouds and how you can tell the weather by looking at the clouds. What kind of clouds are in these three pictures?
- Discuss the term virga. It looks like there are some virga in the picture from Oaxaca.
- Locate Oaxaca on a map of North America. What country is it in?
- Take this opportunity to discuss the water cycle and how water moves through air, on the earth, and inside the earth.
• Compare these Steiner photographs. Look at the clouds and try to predict what kind of weather they would each be carrying.

Activities:
• Create a cloud chart showing different types of clouds for different types of weather.
• Invite a weather forecaster to come talk to the class about clouds and weather.
• Make a chart or journal where you can keep track of the types of clouds and related weather each day for two weeks or a month. Chart how many days there were certain types of clouds and what the weather was. Notice the weather on different days of the week—is there a pattern? Do some days seem naturally more rainy or sunny than others? Try to predict the weather from what you have observed.
• Did you ever notice that during the winter it seems to snow (or storm) on the same day of the week? Can you speculate why that happens?

Attributed to Maxime Lalanne
French, 1827 - 1886
Weymouth Bay
Etching
10 3/8 x 14 in
26.4 x 35.6 cm
00.75
Gift of anonymous donor
Collection of the Haggerty Museum of Art, Marquette University

Weymouth Bay attributed to Maxime Lalanne

Discussion:
• What can you see in this picture?
• Look at the sky. These are sometimes called “angry” clouds. Can you guess why?
• Can you see any light in this picture?
• What time of day do you think this is? How do you know?
• Is this a highly populated area? How can you tell?
• When you look at this picture, how do you feel? Is this a happy picture?
• This is a great example of values—different shades/hues of black, white, and gray. Do you think these colors/lack of colors have an effect on the way you feel about this picture?
• The name of this artwork is Weymouth Bay. What is a bay? Where is this bay? Locate it on a map.

Background Information
Weymouth Bay is on the south coast of England, in Dorset. It is protected from erosion by Chesil Beach and the Isle of Portland, and includes several beaches, notably Weymouth Beach, a gently curving arc of golden sand which stretches from the resort of Weymouth, along to the suburbs of Greenhill, Lodmoor and Preston, and terminates just past Furzy Cliff at Bowleaze Cove—a haven for watersports, windsurfing, scuba diving, jet skiing, surfing and swimming. This beauty has earned the bay the title of “England's Bay of Naples.”
http://en.wikipedia.org/wiki/Weymouth_Bay
• Where do you see water (or where is water implied) in this artwork?
• How do we relate to water in this picture?

Activities:
• What is an etching? Describe the process through a demonstrative speech with visuals.

Background Information
Etching is the process of using strong acid to cut into the unprotected parts of a metal surface to create a design in intaglio in the metal. As an intaglio method of printmaking, it is, along with engraving, the most important technique for Old Master prints, and remains in wide use today. http://en.wikipedia.org/wiki/Etching

• Use a yardstick to measure the size of the etching. What size paper would you need to recreate a picture of the same size?
• Using only black and white paint, create a monoprint of a storm scene. What is a monoprint?
• Use charcoal, erasers, and stumps to create a drawing that shows different values by erasing areas to make highlights, or by using a stump to create varying shades of gray.
• Find poetry about rain or storms and read aloud to the class.
## List of Images

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untitled, John Horvath</td>
<td>1</td>
</tr>
<tr>
<td>Atop Mt. Atago in the Shiba District, Utagawa Hiroshige</td>
<td>9</td>
</tr>
<tr>
<td>Three Cascades, Union River, Porcupine Mountain State Park, Michigan, Tom Uttech</td>
<td>11</td>
</tr>
<tr>
<td>My Blue Lake, Kiki Smith</td>
<td>12</td>
</tr>
<tr>
<td>Perimeter, Portraits, Kevin J. Miyazaki</td>
<td>13</td>
</tr>
<tr>
<td>Esperanza or Macarena of Miracles, Audrey Flack</td>
<td>15</td>
</tr>
<tr>
<td>Untitled (Mimi in nightgown), Jocelyn Lee</td>
<td>16</td>
</tr>
<tr>
<td>Rebecca at the Well from The Bible Series, Marc Chagall</td>
<td>17</td>
</tr>
<tr>
<td>Rebecca at the Well, G. Viviani</td>
<td>17</td>
</tr>
<tr>
<td>Mayo Clinic, Chart, How the Body Uses Water</td>
<td>18</td>
</tr>
<tr>
<td>Perimeter, Waterscapes, Kevin J. Miyazaki</td>
<td>19</td>
</tr>
<tr>
<td>Perimeter, Portraits, Kevin J. Miyazaki</td>
<td>20</td>
</tr>
<tr>
<td>Children Dancing by the Lake, Barbara Morgan</td>
<td>23</td>
</tr>
<tr>
<td>no world from An Unpeopled Land in Uncharted Waters, Kara Walker</td>
<td>24</td>
</tr>
<tr>
<td>Edge of Town (Missouri River), Thomas Hart Benton</td>
<td>25</td>
</tr>
<tr>
<td>A Moor Robing After the Bath, Rodolphe Ernst</td>
<td>26</td>
</tr>
<tr>
<td>Mono Lake, Barbara Morgan</td>
<td>27</td>
</tr>
<tr>
<td>Morton A. Mort, Roy Lichtenstein</td>
<td>27</td>
</tr>
<tr>
<td>Leeward Start, Wallace Herndon Smith</td>
<td>28</td>
</tr>
<tr>
<td>Thin Ice, Low Levees, Frances Myers</td>
<td>29</td>
</tr>
<tr>
<td>Winterfreude (Pleasures of Winter), Julius Hübther</td>
<td>30</td>
</tr>
<tr>
<td>Open Channel, David True</td>
<td>31</td>
</tr>
<tr>
<td>Vedute Delle Cascatele A Tivoli, Giovanni Battista Piranesi</td>
<td>32</td>
</tr>
<tr>
<td>Sea, Philip Guston</td>
<td>33</td>
</tr>
<tr>
<td>Untitled (Apple and Worm), Alexis Rockman</td>
<td>34</td>
</tr>
<tr>
<td>Kapok Tree, Alexis Rockman</td>
<td>36</td>
</tr>
<tr>
<td>Rock by a Pool, Lilla Cabot Perry</td>
<td>38</td>
</tr>
<tr>
<td>Untitled, Arturo Garcia Bustos</td>
<td>39</td>
</tr>
<tr>
<td>Untitled, Ruth Grotenrath</td>
<td>40</td>
</tr>
<tr>
<td>Untitled (Wolf, Alligator and Fish), Tim Ebner</td>
<td>41</td>
</tr>
<tr>
<td>Kajikazawa in Kai Province from Thirty-six of Mount Fugi, Katsushika Hokusai</td>
<td>42</td>
</tr>
<tr>
<td>The Mending of the Trout Net, Robert Von Neumann</td>
<td>42</td>
</tr>
<tr>
<td>Malibu Beach, California, Joe Deal</td>
<td>43</td>
</tr>
<tr>
<td>Landscape #2, Steve Davis</td>
<td>44</td>
</tr>
<tr>
<td>Generation to Generation: Strategic Defense Initiative, Nuclear Powered Vehicles, West Mesa, Albuquerque, New Mexico, Patrick Nagatani</td>
<td>46</td>
</tr>
<tr>
<td>Mid Hudson Bridge, Ralph Steiner</td>
<td>47</td>
</tr>
<tr>
<td>East, West, Jennifer Bartlett</td>
<td>48</td>
</tr>
<tr>
<td>Swamp and Pipeline, Giesmart, Louisiana, Richard Misrach</td>
<td>49</td>
</tr>
<tr>
<td>Occidental #26, Niagara Falls, NY, John Pfahl</td>
<td>50</td>
</tr>
<tr>
<td>River Scene-Eads Bridge, James Baare Turnbull</td>
<td>51</td>
</tr>
<tr>
<td>SOCAR Oil Field #1 a&amp;b, Baku Azerbaijan, Edward Burtynsky</td>
<td>52</td>
</tr>
<tr>
<td>Driving Rain at Shunk (no. 46) from 53 Stations of the Tokaido Road, Utagawa Hiroshige</td>
<td>55</td>
</tr>
<tr>
<td>Barbara Morgan Sketching in Grand Canyon, Willard Morgan</td>
<td>58</td>
</tr>
<tr>
<td>The Arms of Undertow, John D’agostino</td>
<td>59</td>
</tr>
<tr>
<td>Sturmwolken Uber Cape Cod (Storm Clouds Over Cape Cod), George Grosz</td>
<td>60</td>
</tr>
</tbody>
</table>
Wave, Robert Longo 61

Untitled (Clouds, Oaxaca), Ralph Steiner 62

Dark Cloud with “Claws” Reaching toward Mountains, Ralph Steiner 62

Peacock Tail (Peacock Feathers), Ralph Steiner 62

Weymouth Bay, Attributed to Maxime Lalanne 63
List of Websites

http://plantsciences.montana.edu/horticulture/ASHS_Teaching_MethodsWG/Intro%20to%20Horticulture/Orvis_seed%20necklace%20activity.pdf
http://www.weatherwizkids.com/weather-optical-illusions.htm
http://www.wikihow.com/Make-a-Rainbow
www.proteacher.org/a/25892_Water_Cycle.html
http://cases.soe.umich.edu/plans.php?frame=main&dqid=320&lpid=127
http://collections.walkerart.org/item/object/7449
www.wupcenter.mtu.edu
http://pbskids.org/lunchlab
http://www.biology4kids.com/files/cell_main.html
http://www.mayoclinic.com/health/water/NU00283
http://www.mayoclinic.com/health/medical/IM00594
http://wupcenter.mtu.edu/education/familysciencenight/lesson_plans/Aqua_Bodies_Lesson_Plan_K-2.pdf
www.drsrsd.com
http://www.pbs.org/teachers/includes/content/lunchlab/hydration.pdf
http://scienceline.org/2006/10/ask-driscoll-tears
http://wupcenter.mtu.edu/education/familysciencenight/lesson_plans/Aqua_Bodies_Lesson_Plan_K-2.pdf
http://www.pbs.org/teachers/includes/content/lunchlab/hydration.pdf
www.Aquarionwater.com
http://www.mayoclinic.com/health/medical/IM00594
www.water.org
www.aquarion.com
http://witcombe.sbc.edu/water
http://learn.walkerart.org/karawalker/Main/IntroductionToThemes
http://www.redlineartmke.org
http://en.wikipedia.org/wiki/Aquatint
http://www.livestrong.com/article/176743-what-is-a-rain-barrel
http://ecosystems.psu.edu/youth/sftrc/lesson-plans/water/k-5/rain-garden-2
http://ecosystems.psu.edu/youth/sftrc/lesson-plans/water/k-5/rain-garden-2
http://www.epa.state.il.us/kids/fun-stuff/water-cycle/wheel-instruct.html
www.drsrsd.com
www.aquarion.com
http://www.water.epa.gov
http://uwarboretum.org/eps/research_act_classroom/rain_garden_curriculum.php
http://city.milwaukee.gov/water
http://www.kidzone.ws/water
http://ga.water.usgs.gov/edu/watercycleplacemat.html
http://www.epa.gov/region1/students/pdfs/ww_drain.pdf