Water Across the Curriculum

Educator Resource Guide

Pre-K – 12th grade

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). Gift of Lloyd and Janet Morgan, Collection of the Haggerty Museum of Art, Marquette University, 91.3.61.

HAGGERTY MUSEUM OF ART
MARQUETTE UNIVERSITY

Table of Contents

Thank you to all who contributed to this project:

Funding for Water Across the Curriculum is generously provided by Mr. and Mrs. Frank P. Thometz, the John P. Raynor, S.J. Endowment Fund, and the Friends of the Haggerty Museum of Art.

Special thanks to UWM's Peck School of the Arts Department of Art & Design, ArtsECO (Arts Education/Community Ecosystem) interns Bri Sayeg and Susannah Fricker, Alverno College Internship Program, Rebecca Sarenac (Media Design), and Marquette University's Educational Opportunity Program high school student interns Jaylin Rivas and Demaris Rodriguez.

Content advising provided by our partners: Reflo Sustainable Water Solutions, Sweet Water Freshwater Facilitators, Liz Sutton and the University of Wisconsin-Milwaukee School of Freshwater Sciences, Kyana Young from Wake Forest University, Kate Morgan and Christina Taddy from the Milwaukee Metropolitan Sewerage District, Marquette University Water Quality Center, Aaron Zeleske from Harbor District Milwaukee, Kae DonLevy with the Freshwater Tool Kit and Shorewood Waters Project, Sandy Brehl for water related book recommendations, and staff at the Trowbridge School of Great Lakes Studies.

Note to Educators

The Water Across the Curriculum (WAC) program is designed both to offer educators a menu of enrichment options and to train university students studying education to integrate the visual arts into their classroom curricula. To get the most from this program we encourage you to combine this resource guide, 2 – 3 classroom visits that feature inquiry-based discussions and hands-on activities, a tour for your students at the Haggerty Museum of Art (HMA), and take-home activities for your students to share their learning with their families.

For information about booking a tour at HMA for your students, visit our website here.

This resource guide provides activities designed to integrate the diverse arts of the HMA collection into your classroom to support skills and concepts that you are already teaching, or that you may be planning to teach. Thematic chapters introduce students to HMA artworks through grade-appropriate activities that encourage them to think critically, to express themselves creatively, and to make connections between their own lives and WATER.

As part of Marquette University, HMA fully embraces Ignatian Pedagogy (IP) in our teaching methods. IP is a practical teaching framework that creates opportunities for personal and cooperative study, discovery, creativity, and reflection to foster lifelong learners.

What are the benefits of integrating art into your teaching?

Art is diverse. The HMA collection spans many cultures, traditions, time periods, and histories.

Art is accessible. HMA believes that art is for everyone! Which is why HMA is open every day of the week and is free for all.

Art fits into the curriculum. Each chapter was designed to support interdisciplinary grade-level standards, though the activities can be adapted to meet the needs of a variety of grade levels.

Art is engaging! Each section follows an IP model. Complete as many or as few segments as your time allows.

Christine Fleming
Manager of Community Engagement

How to Use this Resource

Please use this resource digitally; there are many links to websites, videos, and activities. If you do print out a chapter, please conserve paper and print only what you need. This resource guide includes four chapters of water-related themes with recommended grade levels. You will notice similar sections running throughout the entire resource guide. These sections directly connect to key tenets of the Ignatian Pedagogy process: **Context, Experience, Reflection, Action,** and **Evaluation.**

Experience and Explore

To enhance learning, each chapter includes opportunities for students to gather and recall the material of their own experience in order to create deeper meaning.

Art in Context

Learn more about the 19 artworks and 14 artists that are included in this resource guide and how this work connects to water issues and themes. Each chapter features 3 or more artworks from the HMA collection. Each artwork is featured as a two-page printable resource. The first page features the artwork on a full page, the next page includes information about the artist. Feel free to print these out for your students. Make use of any and all featured artworks from all chapters in your classroom.

Make It Personal

Help students formulate questions that will broaden their awareness and compel them to consider the viewpoints of others.

Evaluation

Evaluations give you and your students time to reflect on what you have learned and how the WAC program enriched your classroom teaching goals. A feedback form is available here. Please take a few minutes to let us know what you think, and encourage your students to help you fill it out.

Deep Dives

This resource guide is just a starting place! Investigate additional resources from local and global organizations, read books selected by Sandy Brehl, request a visit to HMA, or arrange a classroom visit from the lesson plan themes listed.

Engage

Use the recommended activities to challenge the imagination of your students to put each theme into action.

Talking about Art with Students

Discussing a work of art as a group generates interest in and ideas about the work. Given the integral relationship between speaking, listening, and writing, these discussions also prepare students for successful writing by allowing them to rehearse the language that they will use in their written work.

What questions should I ask to facilitate a discussion about art with my students?

Look. Begin by asking everyone to look at the image quietly for a few moments. This gives them an opportunity to digest the visual information.

Describe. Next, have students describe what they notice about the work of art. What do we notice? What more can we find? Make sure to record the observations for the group.

Think. Next, ask more analytical questions. What do we think about what we see? What do our observations tell us about the artist's perspective, story, ideas, or the mood of the work of art? How is water represented in this artwork? Ask questions of your own, or see what questions students have.

Discover. If factual questions arise, read the Art in Context section of each artwork for more information. Then ask the group to consider what new thoughts they might have.

Respond. Last, invite personal responses. How does the artwork relate to your own life experiences and prior knowledge? How do you use water? What is your favorite way to use water?

What if I don't know all of the information about a work of art or artist?

Don't worry! Having a discussion about art is about sharing ideas, not giving a lecture. You do not have to be an art expert to facilitate a discussion with your students. The idea is to observe and respond together. The primary objective of this resource guide is to use art as an inspiration to explore interdisciplinary themes. If looking at a work of art inspires further investigation or research, that's fantastic!

What if everyone has a different opinion or understands the artwork differently?

Art is multi-layered in its meaning, and everyone comes to it with their own life experiences. Therefore, everyone will respond a little differently. It is important to validate all ideas equally, and without judgment.

Chapter 1

What is Water?

Pre-K – 5th grade

Chapter Objective

Students will use observation skills to explore water and artists' depictions of water. Using these observations students will answer the question, What is Water?

Supported Standards

Science, Grade K-2, SCI.SEP3.A.K–2: Make observations (firsthand or from media) and measurements to collect data that can be used to make comparisons. (WI Standards for Science, adopted 2017)

Visual Art, Grade 2, VA:Re.7.1.2a: Perceive and describe aesthetic characteristics of one's natural world and constructed environments. (National Core Art Standards, created 2014)

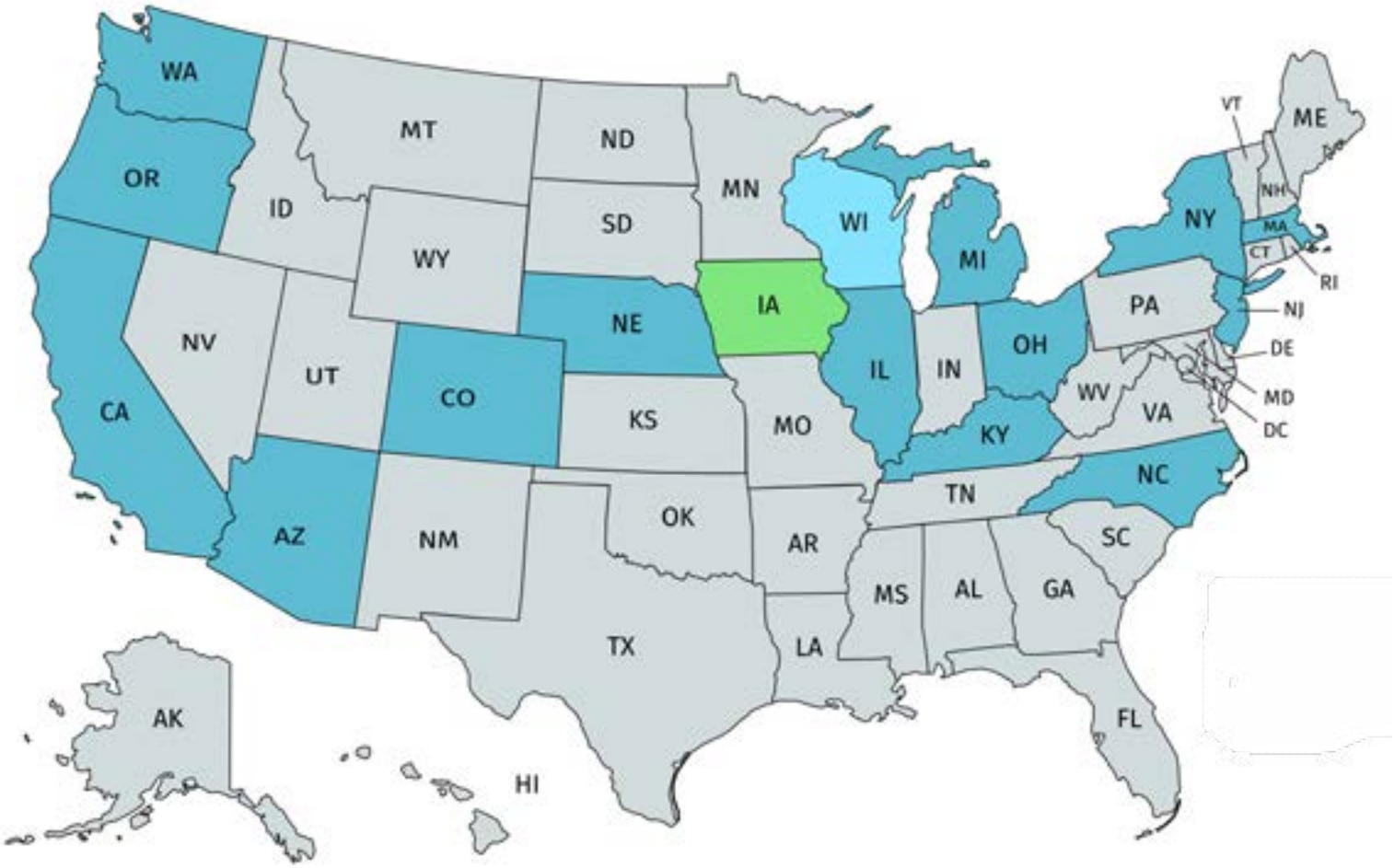
Back to the Table of Contents

Kevin J. Miyazaki (American, b. 1966), *Lake Michigan from Michigan City, Indiana* (*Perimeter* series), 2012. Digital chromogenic color print, 24 x 30 in (60.96 x 76.2 cm). Gift of the artist, Collection of the Haggerty Museum of Art, Marquette University, 2014.8.11.

Kevin J. Miyazaki (American, b. 1966), *Earl and Charlese West in Whitting,* Indiana, (*Perimeter* series), 2012. Digital chromogenic color print, 24 x 20 in (60.96 x 50.8 cm). Gift of the artist, Collection of the Haggerty Museum of Art, Marquette University, 2014.8.5.

Art in Context

Use this map with your students to explore Kevin J. Miyazaki's life and work.



Where in the U.S.A. is Kevin Miyazaki's art?

Miyazaki earned a bachelor's degree in 1990 at Drake University.

Miyazaki lives in Milwaukee, WI.

"*Perimeter* was a project commissioned by the Haggerty Museum of Art at Marquette University, which invited me to create new work addressing the topic of fresh water and the Great Lakes." Source

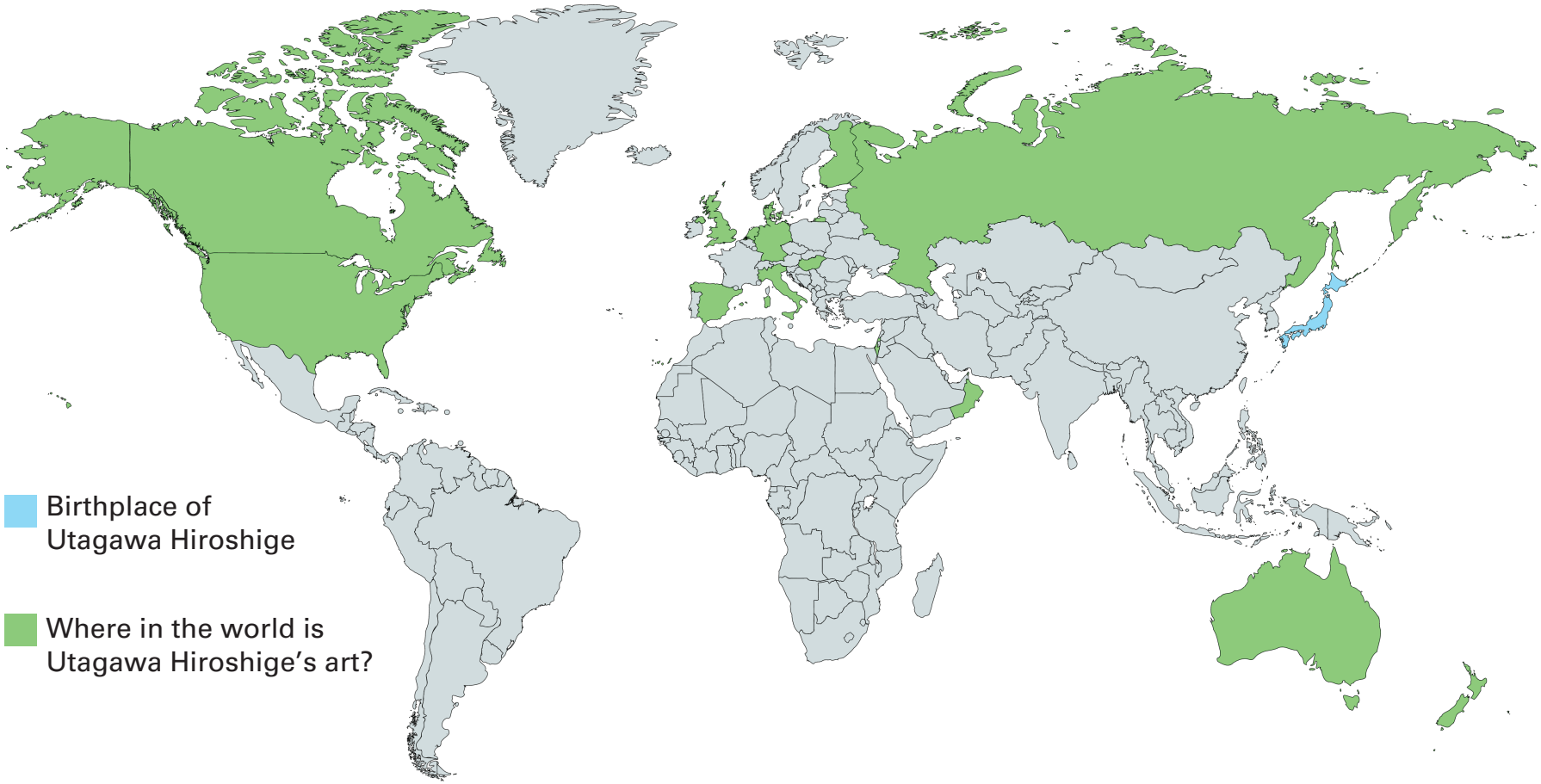
Learn more about the *Perimeter* series on the artist's website here.

Artists make art in a variety of ways. Since photography and computer printing became the norm, portrait and landscape formatting is used to describe an artwork's **orientation**. Often artwork featuring people is done in a portrait format, while artwork featuring land or sea is done in a landscape format. Look through the rest of the artworks in this resource guide — do the other artworks follow this "rule"?

Utagawa Hiroshige (Japanese, 1797 – 1858), *Barges on the Yotsugi-dori Canal (no. 33) from One Hundred Famous Views of Edo*, 1856 - 1858. Woodblock print. Gift of Cava Ross Estate, Collection of the Haggerty Museum of Art, Marquette University, 88.8.6.3.

Art in Context

Use this map with your students to explore Utagawa Hiroshige's life and work.



Can you match the country name with the map above?

1. The Haggerty Museum of Art, Milwaukee, WI, U.S.A.
2. Hermitage Museum, Saint Petersburg, Russia
3. Prado Museum, Madrid, Spain
4. Rijksmuseum, Amsterdam, Netherlands
5. Art Gallery of Greater Victoria, British Columbia, Canada
6. Art Gallery of South Australia, Adelaide, Australia
7. Christchurch Art Gallery / Te Puna O Waiwhetu, New Zealand
8. Victoria and Albert Museum, London, England
9. Hungarian National Gallery, Budapest, Hungary
10. Statens Museum for Kunst / National Gallery of Denmark, Copenhagen, Denmark
11. Tikotin Museum of Japanese Art, Haifa, Israel
12. Valtion Taidemuseo / Finnish National Gallery, Helsinki, Finland
13. Wallraf Richartz Museum, Cologne, Germany
14. Scuderie del Quirinale exhibition, Rome, Italy

Watch this video to learn more about how Utagawa Hiroshige inspired a world of artists. Click here.

Asako Narahashi (Japanese, b. 1959), *Yunohama*, 2004. Chromogenic color print, 35 1/2 x 55 1/2 in (90.17 x 140.97 cm). Museum purchase with funds from Mrs. Martha W. Smith by exchange, Collection of the Haggerty Museum of Art, Marquette University, 2010.4.

Art in Context

Use this timeline with your students to explore Asako Narahashi's life and work.

Asako Narahashi was born in Tokyo, Japan, 1959.

Japanese event: Prince Akihito marries a commoner, Mishiko Shoda, in Japan on April 10, 1959.

1959

In 1968, Japan's economy became the second largest in the world, in a phenomenon known as the Economic Miracle. The day-to-day life of the average Tokyoite changed rapidly as the country developed a reputation for electrical appliances and gadgets.

1968

Narahashi earned a degree from the School of Letters, Art, and Science of Waseda University in Tokoyo, Japan, 1989.

1989

Narahashi opens her independent photo gallery "03FOTOS" in Tokyo, Japan, with a solo exhibition of her work titled *Mata Yuku Hito (See you again)*.

1990

In the early 1990s, Narahashi explored street photography.

Fun Fact: Between 1838 and 1839 the first photograph of figures in the street was recorded by Louis-Jacques-Mandé Daguerre in one of a pair of daguerreotype views taken from the window of his studio on the Boulevard du Temple in Paris.

1994

2001

One day in 2001 Narahashi went with some friends to visit the beach. " While I was swimming," she told an interviewer, "I happened to see my friends...on the beach. That was the very beginning." It was the beginning of a series of photographs that she would eventually title *half awake and half asleep in the water*. Shortly after her beach visit, Narahashi purchased a 35mm Nikonos waterproof camera.

Fun Fact: Nikon (which is headquartered in Tokyo, Japan) stopped making the Nikonos camera in 2001.

"I am not a very good swimmer, and I am rather uncomfortable in the water. I cannot escape a sense of fear. Even if I decide that I want to take a photograph from [the water], there are times when I just can't do it." Source

* Although Narahashi isn't a good swimmer, she challenges herself when she takes her photographs. Find a partner and share **how do you challenge yourself?**

Barbara Morgan (American, 1900 – 1992), *Wind Ripples in Mono Lake*, 1929. Gelatin silver print, 6 1/4 x 9 1/2 in (15.9 x 24.1 cm).
Gift of Lloyd and Janet Morgan, Collection of the Haggerty Museum of Art, Marquette University, 91.3.53.

Art in Context

Use this timeline with your students to explore Barbara Morgan's life and work.

1900

Barbara Morgan was born in Buffalo, Kansas* S,Q,?, on July 8, 1900.

American event: The 1900 census is conducted ml Hs l c /*/7. . . In the first census of the 20th century, the population of the United States rose to 76,212,168, a 21% increase since 1890. For the first time, the census included all fifty entities that would become the fifty states after Hawaii officially became a territory of the United States on August 12, 1898.

1923

Morgan graduated from the University of California at Los Angeles (UCLA).

American event: In 1923, the 450-foot-long, 45-foot-tall "Hollywood" sign was erected on Mount Lee as a promotion for the Hollywoodland subdivison in Beachwood Canyon, CA.

1924

Morgan taught high school and college art courses after graduating in 1923.

1938

Morgan traveled all over the United States while creating her artwork. Beginning around 1938 and extending into the early 1940s, her dance photographs traveled to over 150 colleges and other exhibition spaces in New York, Chicago, Philadelphia, the West Coast, New England, and many places gl between.

American event: World War II, also known as the Second World War, was a global war that lasted from 1939 to 1945. The vast majority of the world's countries, including all the great powers, eventually formed two opposing military alliances: the Allies and the Axis.

1951

Morgan produced a volume of photographs, *Summer Children*, consisting of pictures of her own and other children at summer camp. These pictures, taken during the years of World War II, were Morgan's attempt to offer an expression of hope and courage during a difficult time in the nation's history.

1938

Morgan was a guest instructor for the Ansel Adams Yosemite Workshops in 1970 and 1971. After years of working in photography, she resumed creating in drawing, watercolor, and painting as well, aml rgl sgl e through the 1970s.

1992

Morgan died August 19,1992* in North Tarrytown, NY* at the age of 92.

American event: Space Shuttle Endeavour landed safely on May 16, 1992, after a successful maiden voyage.

* Many of Morgan's artworks feature dancers. Can water dance? Work together to create a one-minute dance as water and perform for the class. Will your water dance represent a calm stream, ocean waves, rain drops, or another type of water?

Experience and Explore

Describe It Activity:

Water is such a common substance that we barely notice it. It is around us every day, all the time. We use it for drinking, washing (ourselves, our clothes, and even our homes), recreation, and waste disposal, yet we take it for granted.

Give students time to look closely at a container of water. Work with students to create a list of words on the board that describe water. Helpful categories: the five senses.

Give students time to look closely at *Wind Ripples in Mono Lake*, 1929, by Barbara Morgan. Work with students to create a list of words on the board that describe the artwork. Helpful categories: the principles and elements of art.

* Looking at art tip: Ask students to describe where they see each word within the artwork (no pointing allowed). This will build important visual language skills.

Discuss the two lists of words as a class. What similarities and differences can they find when comparing the two lists?

Define It Activity:

In small groups, or as a large group, have students create a one-sentence definition of water using the list of words collected during the Describe It activity. Discuss as a class, then compare either the Merriam-Webster or the Oxford Dictionary definition of water.

The Dictionary by Merriam-Webster:

The liquid that descends from the clouds as rain, forms streams, lakes, and seas, and is a major constituent of all living matter and that when pure is an odorless, tasteless, very slightly compressible liquid oxide of hydrogen H_2O which appears bluish in thick layers, freezes at 0° C and boils at 100° C, has a maximum density at 4° C and a high specific heat, is feebly ionized to hydrogen and hydroxyl ions, and is a poor conductor of electricity and a good solvent.

OR

Oxford English Dictionary:

A colorless, transparent, odorless liquid that forms the seas, lakes, rivers, and rain and is the basis of the fluids of living organisms.

Make It Personal

Reflect

Using a bubble mapping worksheet, have students map their personal connections with and knowledge about water.

1. Start with the middle bubble and have students write as many names for water as they know, and at least one new name. (Water, Eau, Agua, Mizu, Voda, Wasser, find more here.) Explore water as cultural connection.

2. Connect the middle bubble with the 3 different states of water on Earth (Solid: ice/snow, Liquid: water/rain, Gas: water vapor/steam).

3. Encourage students to write their own personal memories of or stories with each state of water in the remaining connection bubbles.

Engage and Take Action

What can you do to learn more about water?

The Milwaukee Water Commons recommends that you learn to swim! Find out more here.

Find swimming lessons available near you here.

Fun Fact

Water behaves differently on different surfaces. It is more strongly attracted to some materials than others. For instance, water will form beads or droplets on waxed paper, but will be attracted to and absorbed into paper towel material.

Ride the Wave

Organize a classroom visit led by a HMA educator. Choose to do one lesson, or all three! Email Christine.Fleming@marquette.edu to find out more.

Essential Questions:

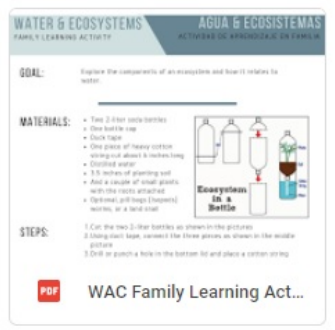
- What effect does water have on your senses?
- Where is water in the world, and what do different water environments entail?
- In what ways is water used in the world?

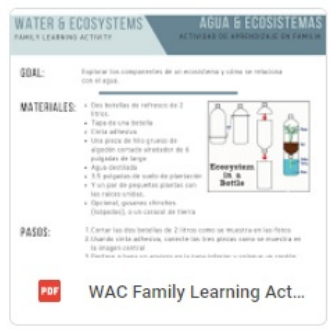
Deep Dives

Ask a local expert!

Send Liz Sutton, Manager, Outreach Program at UWM School of Freshwater Sciences, an email at emsutton@uwm.edu to ask a specific water-related question. She will help to get you and your students an answer.

Family Learning Activity Available in both Spanish and English!





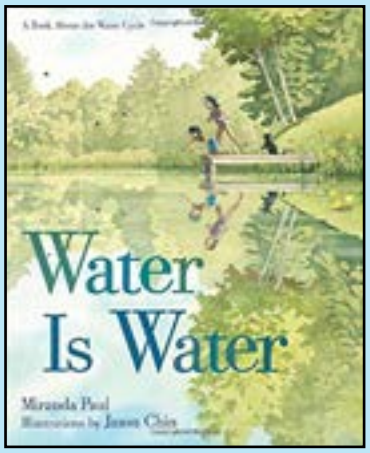
EcoLiteracy Challenge

The EcoLiteracy Challenge is a one-stop shop for water and sustainability-related curricula, projects, presentations, field trips, and more that are designed to engage and excite everyone around our most precious resource: water. Complete water-related activities, sign on to the ELC to report your activities for points, and help build a more sustainable community. Join the EcoLiteracy Challenge here.

Visit the Next.cc website to learn more about water.

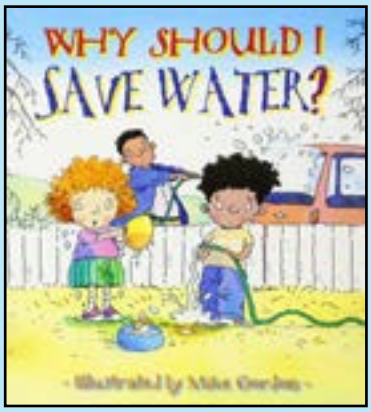
Book Recommendations

Find them at a library near you!



Water Is Water : A Book About the Water Cycle
Author: Miranda Paul
Illustrator: Jason Chin

Watersong
Author: Tim McCanna
Illustrator: Richard Smythe



Why Should I Save Water?
Author: Jen Green
Illustrator: Mike Gordon

For more ideas, check out Goodreads list "Best Children's Books about Water" here.

Chapter 2

The Water Cycle

Pre-K – 5th grade

Chapter Objective

Students will learn about the water cycle. Through observational studies and discussions, students will explore how human actions impact the water cycle and what local organization makes sure our water is safe to drink.

Supported Standards

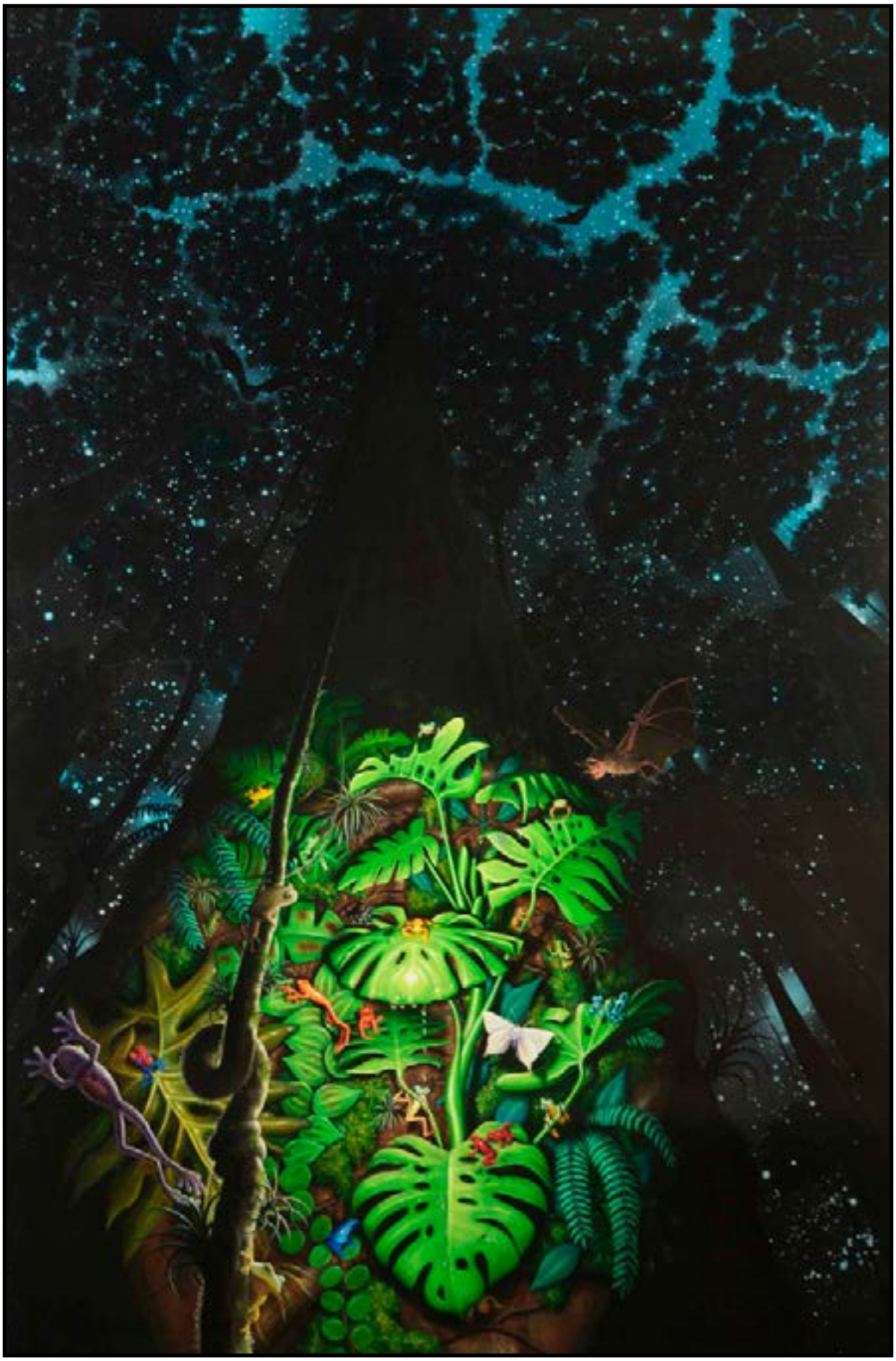
Science, K-ESS3–3: Communicate solutions that will reduce the impact of humans on the land, water, air, or other living things in the local environment. (WI Standards for Science, adopted 2017)

Visual Art, Grade 1, VA:Re.7.1.1a: Select and describe works of art that illustrate daily life experiences of one's self and others. (National Core Art Standards, created 2014)

Water moves in an endless cycle—changing form continuously through **evaporation**, **condensation**, and **precipitation**—known as the water cycle.

All of our water, whether it comes out of a well, a lake, a river, or the sky, has been recycled many times through the water cycle. When precipitation hits the ground, it may stay on the surface and form surface water, such as a lake, river, or stream. The water that soaks into the ground sustains plant and animal life in the soil. Some water seeps into underground **aquifers**.

Learn more here.



Alexis Rockman (American, b. 1962), *Kapok Tree*, 1995. Oil on panel, 96 x 63 3/4 in (243.84 x 161.93 cm). Gift of Peter Norton, Collection of the Haggerty Museum of Art, Marquette University, 2001.13.7.

Art in Context

Use this timeline with your students to explore Alexis Rockman's life and work.

Alexis Rockman was born on September 5, 1962 in New York City, New York, U.S.A.

American event: The modern Environmental Movement, which began in the 1960s with concern about air and water pollution, became broader in scope to include all landscapes and human activities.

1962

Rockman studied animation from 1980 to 1982 at the Rhode Island School of Design and continued his studies at the School of Visual Arts in Manhattan, earning a BFA in 1985.

1980

1994

During Rockman's trip to Guyana in 1994, there was a collapse of a tailings dam (a dam usually used to store materials left from mining operations after separating the ore from the gangue) at the Omni gold mine, causing cyanide to leak into the waterway.

1995

Rockman has undertaken expeditions into the Amazon Basin, Tasmania, Madagascar, South Africa, and Antarctica to research his paintings.

Where might he have traveled to research before painting *Kapok Tree* in 1995?

2008

Rockman traveled to Antarctica in 2008 with Dorothy Spears, and works resulting from this voyage were featured in the *Badlands: New Horizons in Landscape* exhibit at the Massachusetts Museum of Contemporary Art.

2011

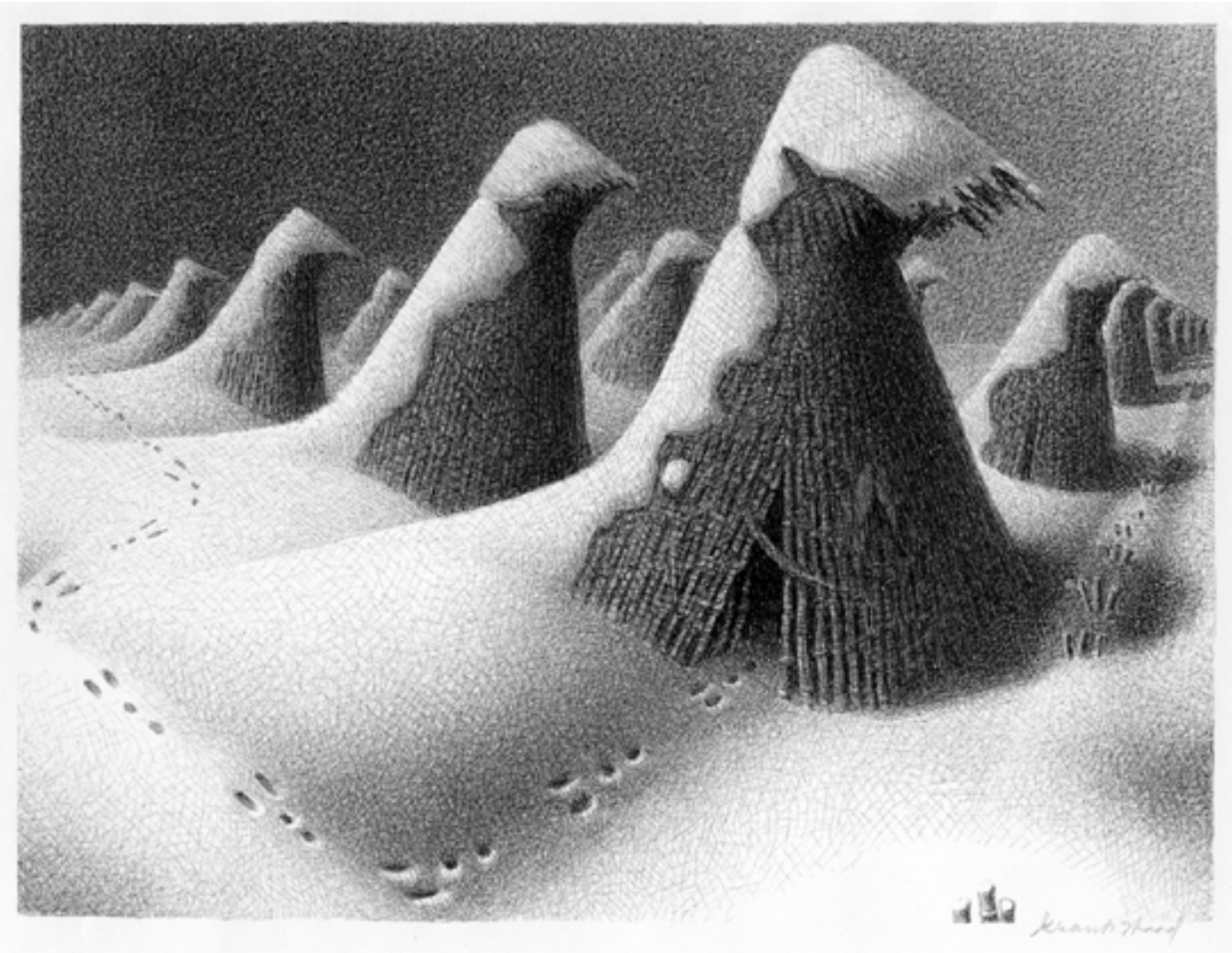
Rockman was involved in the Ang Lee film *Life of Pi*. He completed several watercolor concept paintings and contributed to several visual sequences, including an underwater transition scene which he claims was inspired by the "Star Gate" sequence in Stanley Kubrick's 1968 film *2001: A Space Odyssey.*

Learn more about why film director Ang Lee chose Alexis Rockman to work on concept drawings for *Life of Pi* here.

2019

In 2019, the exhibition *Alexis Rockman: The Great Lakes Cycle* was held at the Haggerty Museum of Art. This multifaceted body of work was initiated in 2013, when Rockman embarked on a research tour of the Great Lakes region.

How many different species of animals can you find in *Kapok Tree*,1995?



Grant Wood (American, 1891 – 1942), *January*, 1938. Lithograph, 9 x 11 7/8 in (22.86 x 30.16 cm). Gift of the Marquette University Jesuit Community, Collection of the Haggerty Museum of Art, Marquette University, 91.9.47.

Art in Context

Use this timeline with your students to explore Grant Wood's life and work.

Grant Wood was born February 13, 1891, in Anamosa, Iowa, U.S.A.

American Event: On May 20, 1891, Thomas Edison's prototype kinetoscope (an early motion picture exhibition device) was first displayed at Edison's Laboratory.

1891

In 1901, Wood began as an apprentice in a local metal shop in Cedar Rapids, Iowa, at the age of 10.

1901

1910

Wood enrolled in the Handcraft Guild, an art school run by women in Minneapolis, Minnesota, in 1910. In 1913, he enrolled at the School of the Art Institute of Chicago, where he created work as a silversmith.

1923

Between 1922 and 1928, Wood made four trips to Europe. In 1923, he spent a year in Paris, France, where he studied at the Académie Julian.

French event: In March 1923 the play *Antigone* by Jean Cocteau appeared on a Paris stage. Set designs by Pablo Picasso, music by Arthur Honegger, and costumes by Gabrielle Chanel. Antonin Artaud played the part of Tiresias.

1930

Wood was involved in the American Regionalism movement, which depicted realistic scenes of rural and small-town America. It grew in the 1930s as a response to the Great Depression, and ended in the 1940s because of a lack of development within the movement and the end of World War II.

1942

Wood died February 12, 1942, in Iowa City, Iowa, U.S.A.

1980

1980 was the first year of issue for the American Arts Commemorative Series. The one-ounce gold medallion honors Wood.

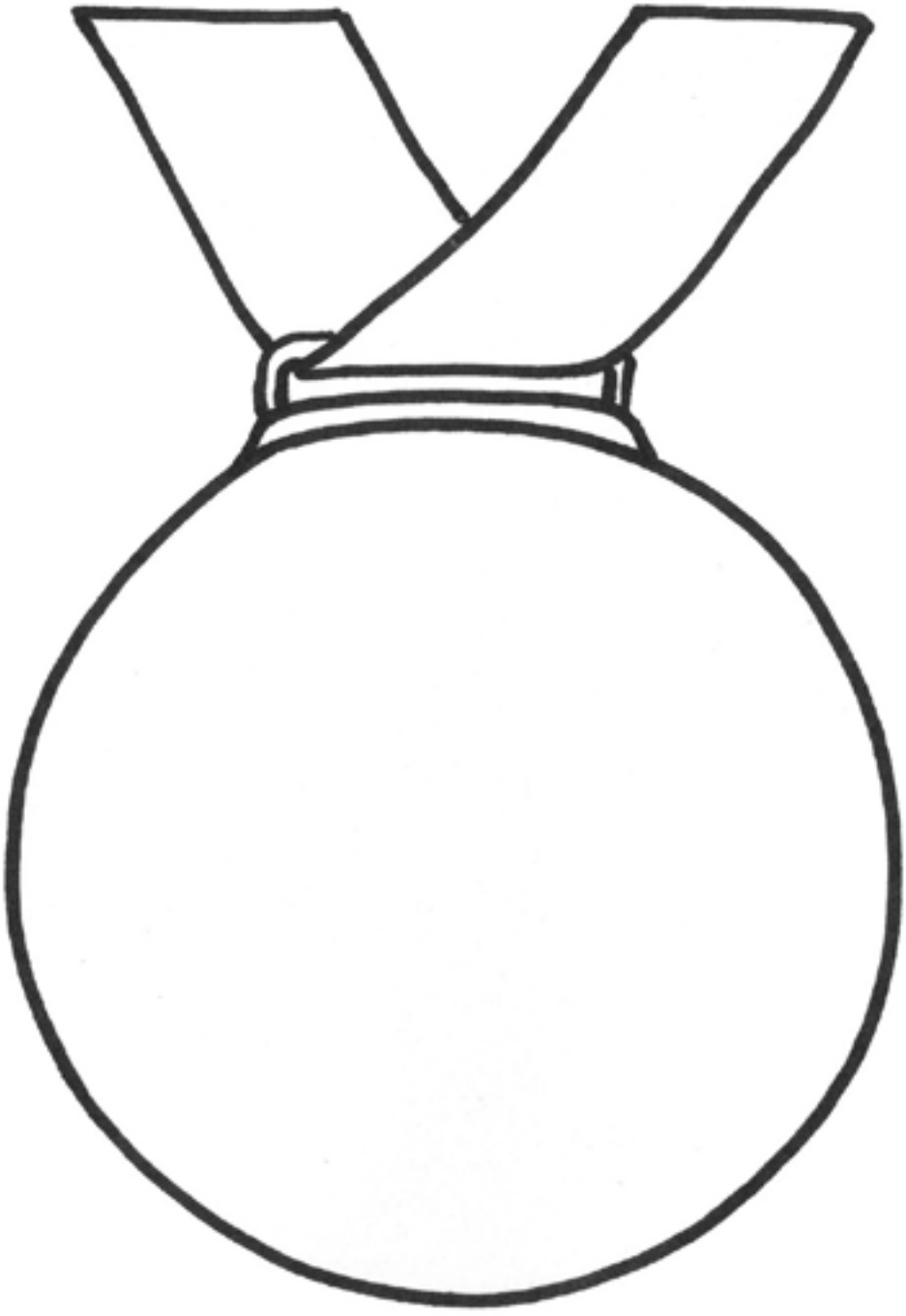
Today, Wood's art can be found in the collections of the Haggerty Museum of Art, Art Institute of Chicago, the Metropolitan Museum of Art in New York, the National Gallery of Art in Washington D.C., and the Los Angeles County Museum of Art, among others.

* Grant Wood was born in February. Why do you think he titled his artwork *January*? Do you have a favorite month? Make a chart in your classroom to compare everyone's favorites.

Use the American Arts Commemorative Series medallion designed to honor Grant Wood in 1980 as an example.

Design your own medallion below.

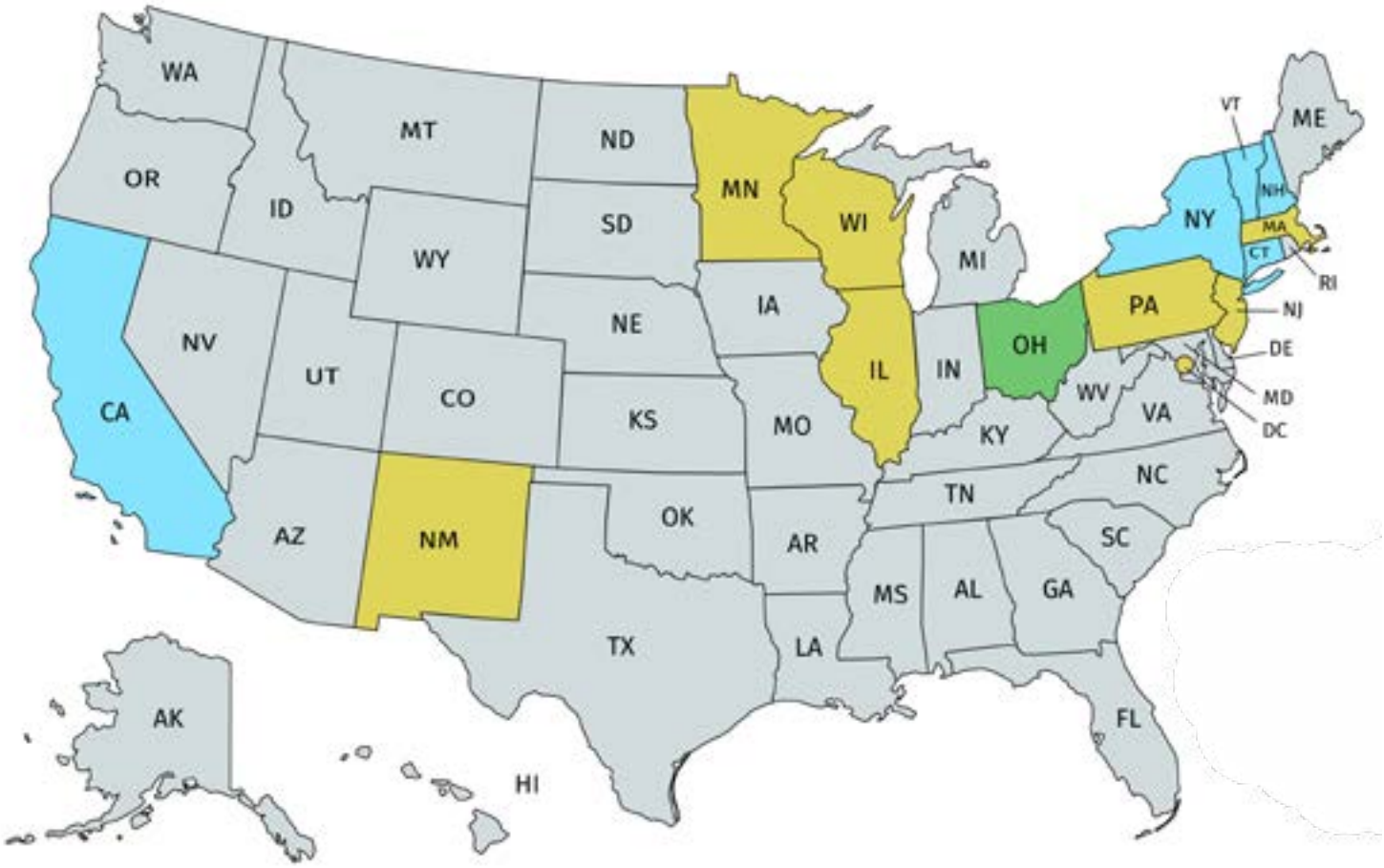
Who will you honor with your design?



Ralph Steiner (American, 1899 – 1986), *Peacock Tail (Peacock Feathers)*, 1980. Gelatin silver print, 7 1/4 x 9 5/8 in (18.4 x 24.4 cm). Gift of Richard D. Riebel, Collection of the Haggerty Museum of Art, Marquette University, 97.10.32.

Art in Context

Use this map with your students to explore Ralph Steiner's life and work.



Ralph Steiner was born February 8, 1899, in Cleveland, Ohio, U.S.A.

Steiner traveled all over the U.S.A. to take pictures and make films.

Where in the U.S.A. is Steiner's art?

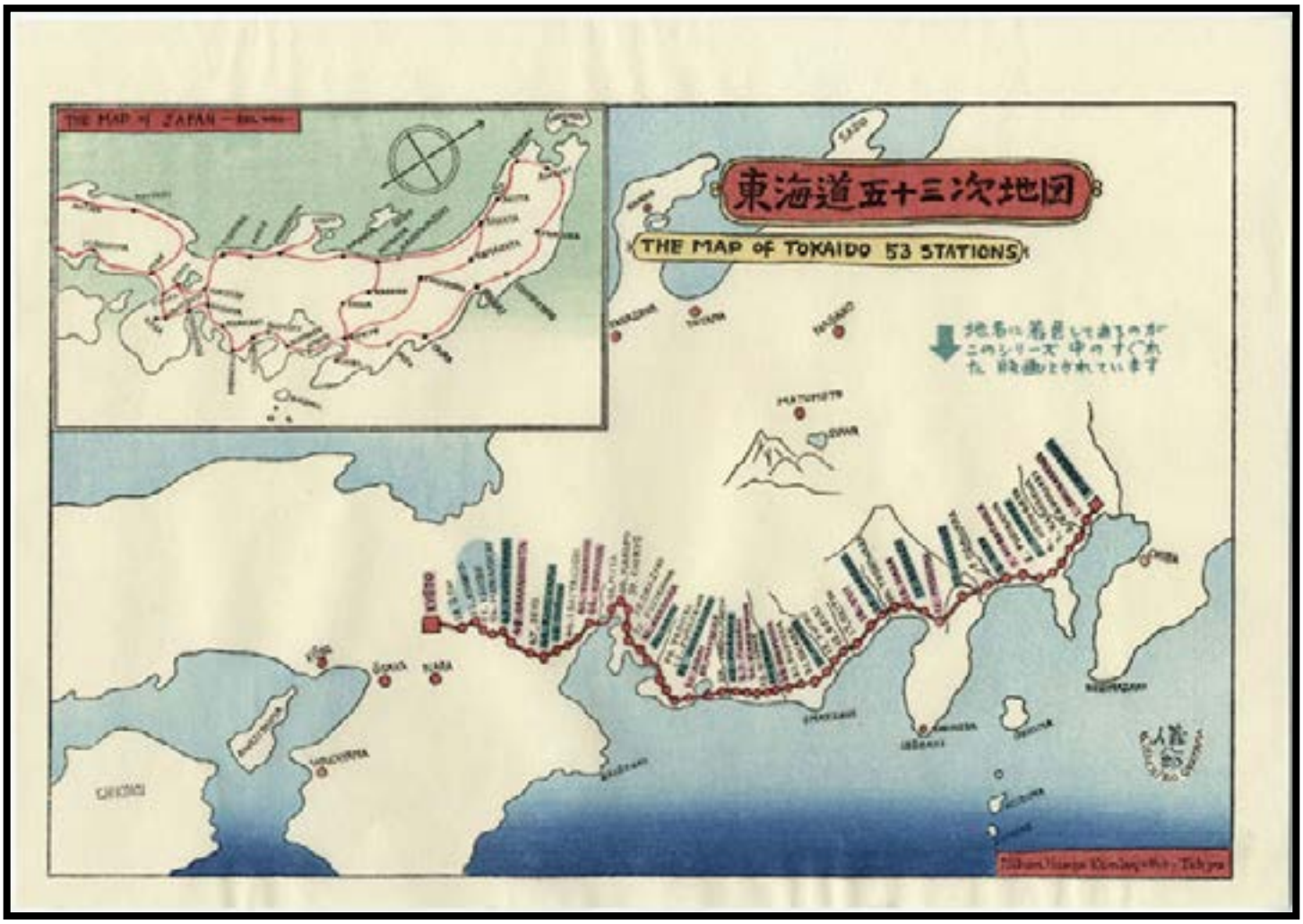
Fun Fact

Steiner studied chemistry at Dartmouth College (New Hampshire), but in 1921 he started attending the Clarence H. White School of Modern Photography (New York City).

Steiner made photographs and moving-image films during his life. Watch his film *Ode to Water*, 1929, here.

Utagawa Hiroshige (Japanese, 1797 – 1858), *Driving Rain at Shuno* (no. 46) *from Fifty Three Stations of the Tokaido Road*. Woodblock print, 9 5/8 x 15 in (24.4 x 38.1 cm). Gift of Mr. Samuel Gansheroff, Collection of the Haggerty Museum of Art, Marquette University, 83.14.9.

Art in Context



The Tokaido road, linking the shogun's capital, Edo, to the imperial one, Kyoto, was the main travel route in old Japan, made of the "Five Roads"(Gokaido)—the five major roads of Japan created or developed during the Edo period to further strengthen the control of the central shogunate administration over the whole country.

In 1832 Utagawa Hiroshige traveled the length of the Tokaido from Edo to Kyoto, as part of an official delegation transporting horses that were to be presented to the imperial court. *Fifty-Three Stations of the Tokaido Road* is a series of **ukiyo-e** woodcut prints created by Hiroshige after his trip.

See all 55 prints here. How many stations include some form of **precipitation**?

* Embossing was a common technique in Japan during the Edo era. Watch a video to learn how to make embossed paper using a carved woodblock here.

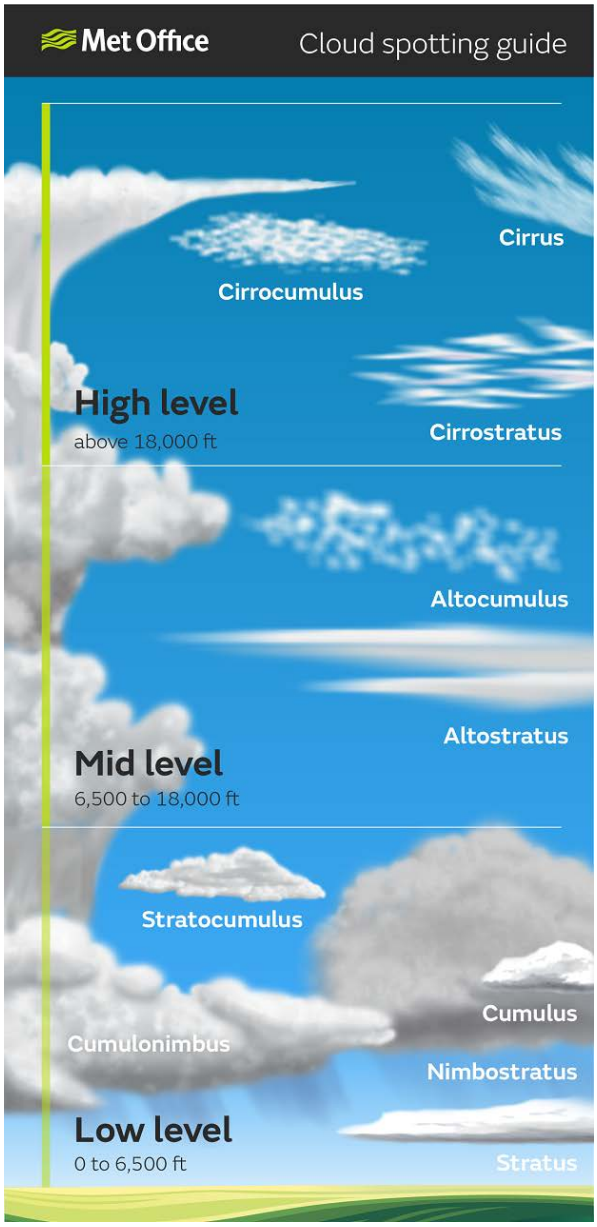
Experience and Explore

Cloud Spotting Activity

Explore different types of clouds as a class. Begin by discussing Steiner's, *Peacock Tail (Peacock Feathers)*, 1980 with your class. Use a cloud spotting guide (or make a cloud wheel here) to identify what type of clouds Ralph Steiner captured in his photograph.

As a class, start observational studies of clouds while on the playground or looking through the classroom window to make a note of the different types of clouds. Collect students' observations to track the types of clouds that they see at certain times each day, and record their findings. These can then be used to draw conclusions about the most common cloud type for that week/month/year. Have students create charts/graphs of the data.

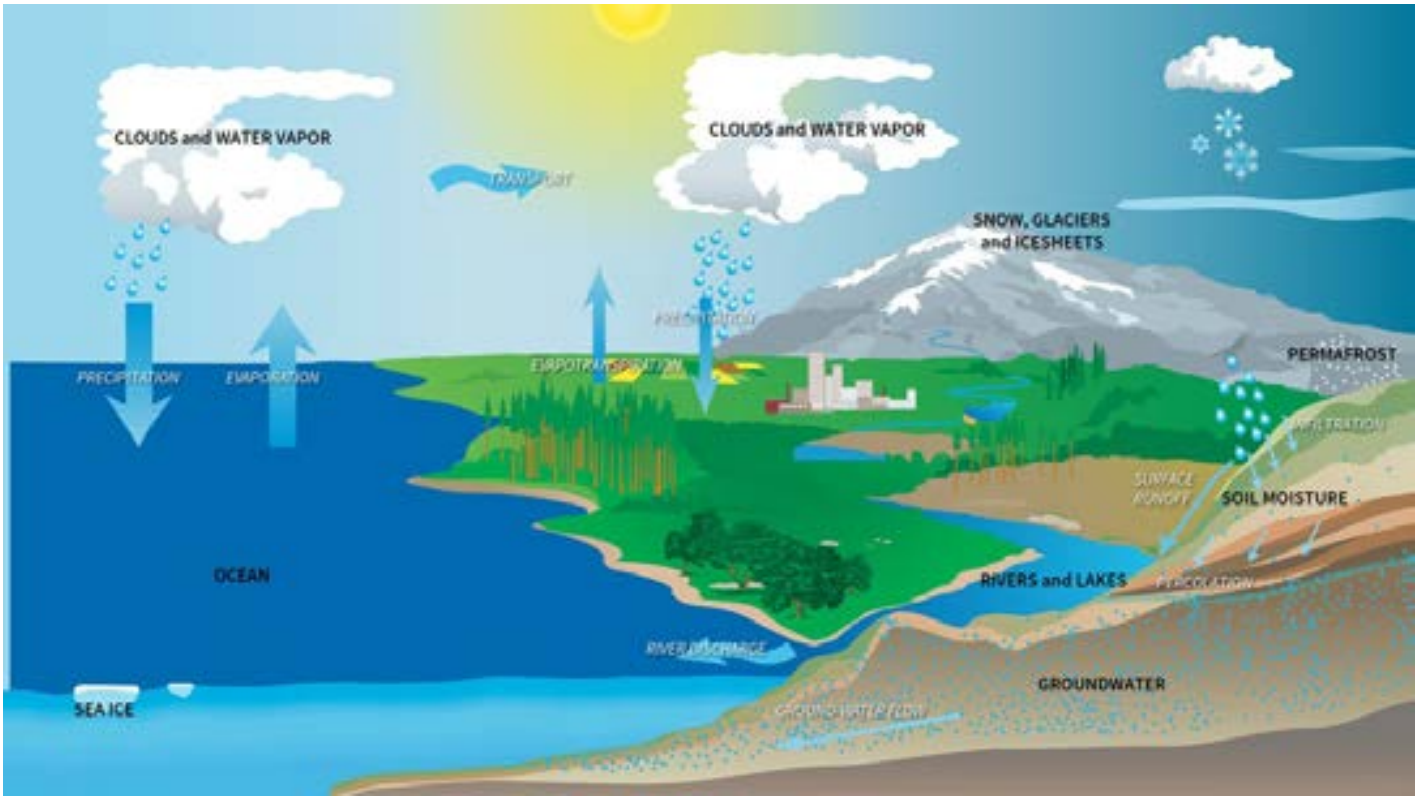
Follow up activity: In small groups, have students select a new title for *Peacock Tail (Peacock Feathers)* using the cloud spotting guide.



Make It Personal

What part of the water cycle do humans impact the most? Use the image below to discuss ways that human actions might impact water moving through the cycle.

A number of human activities can impact the water cycle: damming rivers for **hydroelectricity**, using water for farming (**irrigation**), **deforestation**, the burning of fossil fuels, storing of water in **reservoirs**, and **groundwater mining**.



Who makes sure that the water we get from the lake is safe to use in our homes? Milwaukee Water Works! Learn more about the water treatment process here, or watch this video.

The area of land that drains to a body of water is called a watershed. Milwaukee's three rivers are the Milwaukee, the Menomonee, and the Kinnickinnic. Each has its own watershed. Learn more about our local Milwaukee watershed here.

Ask a local expert!

Send Christina Taddy, Outreach Program Coordinator at Milwaukee Metropolitan Sewerage District, an email at CTaddy@mmsd.com to ask a specific water-related question. She will help to get you and your students an answer.

Engage and Take Action

Connect to the Lake

"Adopt" a storm drain! It is a free and fun way to help our local water cycle. Check out the Respect our Waters website to learn more here.

Sweet Water Freshwater Facilitators is dedicated to protecting our most valuable resource — freshwater. Learn more here.

Ride the Wave

Organize a classroom visit led by a HMA educator. Choose to do one lesson, or all three! Email Christine.Fleming@marquette.edu to find out more.

Essential Questions:

- What is the water cycle?
- How do human actions impact the water cycle?
- What local organization makes sure that our water is safe to drink?
- How are artists from different cultures and time periods inspired by the water cycle?

Deep Dives

Family Learning Activity (Available in both Spanish and English)

Learn More about the Water Cycle with a Rap song by Mr. Lee! Listen here.

EcoLiteracy Challenge

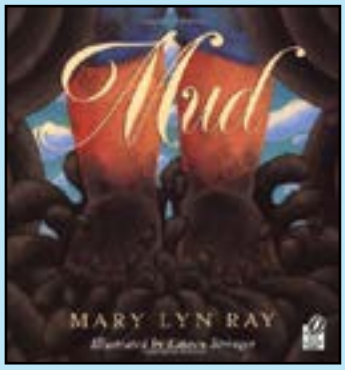
Join the EcoLiteracy Challenge with your students or school here.

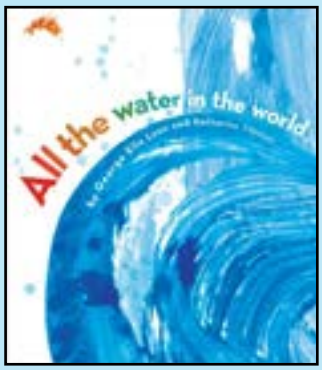
Book Recommendations

Find them at a library near you!

The Snowflake: A Water Cycle Story
Author: Neil Waldman

Mud
Author: Mary Lyn Ray
Illustrator: Lauren Stringer





All the Water in the World
Author: George Ella Lyon
Illustrator: Katherine Tillotson

For more ideas, check out Goodreads list "Best Children's Books about Water" here.

Chapter 3

Water and Pollution

PreK – 12th grade

Chapter Objective

Students will learn about the many sources of water pollution and what they can do to help.

Supported Standards

Science, ELS.C1: Students develop and connect with their sense of place and well-being through observation, exploration, and questioning. (WI Standards for Environmental Literacy and Sustainability, 2018)
Grade 3–5, ELS.C1.B.i: Examine how meeting one's needs for food, water, and shelter can impact natural and cultural systems.
Grade 6–8, ELS.C1.B.m: Identify the relationship between parts of natural and cultural systems in connecting communities into regional systems (e.g., watershed areas, political jurisdictions, ethnic communities).

Visual Art, Grade 6, VA:Cr2.1.6a: Demonstrate openness in trying new ideas, materials, methods, and approaches in making works of art and design. (National Core Art Standards, created 2014)

When you think of sources of water pollution, what comes to mind? You may be surprised to know that today the biggest source of pollution is us—you and me. Known as "**nonpoint source pollution**," this type of pollution can't be traced to any one source. Because we are the source, it is important for us to learn how to prevent such pollution. Rivers are constantly threatened by pollution from chemicals and fertilizers that are washed through the soil by rain and end up in the rivers. In the developing world, 90% of all wastewater still goes untreated into local rivers and streams, making them natural sewers.

Edward Burtynsky (Canadian, b. 1955), *SOCAR Oil Field #1 a*, Baku Azerbaijan, 2006. Digital chromogenic color print, 40 x 120 in (101.6 x 304.8 cm). Museum purchase with funds from Mrs. Martha W. Smith by exchange, Collection of the Haggerty Museum of Art, Marquette University, 2009.31.

Edward Burtynsky (Canadian, b. 1955), *SOCAR Oil Field #1 b*, Baku Azerbaijan, 2006. Digital chromogenic color print, 40 x 120 in (101.6 x 304.8 cm). Museum purchase with funds from Mrs. Martha W. Smith by exchange, Collection of the Haggerty Museum of Art, Marquette University, 2009.31.

Art in Context

Use this map with your students to explore Edward Burtynsky's life and work.

Edward Burtynsky was born February 22, 1955, in St. Catherines, Ontario, Canada.

Where in the world did Burtynsky photograph?

Fun Fact

When Burtynsky was 11, in 1966, his father purchased a darkroom with cameras and an instruction manual, and both learned how to make black-and-white prints. Then, Burtynsky established with his older sister a small business taking portraits at their local Ukrainian Center in Canada. His earliest photographic series was from 1983 to 1985, *Breaking Ground: Mines, Railcuts and Homesteads*. Source.

* Visit Burtynsky's website to explore his photographic series *Water*.

John Pfahl (American, b. 1939), *Occidental #26, Niagara Falls, NY*, 1989. Chromogenic color print, 24 x 20 in (60.96 x 50.8 cm). Museum purchase from the Heller Art Acquisition Fund, Collection of the Haggerty Museum of Art, Marquette University, 2011.5.2.

Art in Context

Use this timeline with your students to explore John Pfahl's life and work.

John Pfahl was born February 17, 1939, in New York City, New York, U.S.A., and was raised in Wanaque, New Jersey.

Fun Fact: Sharp Wisconsin cheese cost 23¢ per POUND in 1939.

1939

1968

Pfahl recieved a BFA from Syracuse University in the School of Art in 1961, and his MA from Syracuse University in the School of Communications in 1968.

1968–1984

Pfahl taught at the Rochester Institute of Technology, Rochester, New York, from 1968–1983. He was also a visiting professor at the University of New Mexico, Albuquerque between 1983–1984.

1985

In 1985, Pfahl resigned as full professor from the School of Photographic Arts and Sciences, Rochester Institute of Technology, to pursue a photographic career.

> As Estelle Jussim wrote, "it is almost impossible for a single photograph to state both the problem and the solution."

1986

Although Pfahl resigned from his role at the Rochester Institute of Technology, he has worked as an adjunct professor at the University of Buffalo, Buffalo, NY, since 1986.

2014

In 2014 alone, Pfahl's artwork was featured in three solo exhibitions:

Joseph Bellows Gallery, La Jolla, CA, *Picture Windows*

Nina Freudenheim Gallery, Buffalo, NY, *Beauty, Humor, Nature, Knowledge*

Janet Borden Gallery, New York, NY, *Found Pfahls*

As well as four group exhibitions:

Albright-Knox Art Gallery, Buffalo, NY, *Anselm Kiefer, Beyond Landscape*

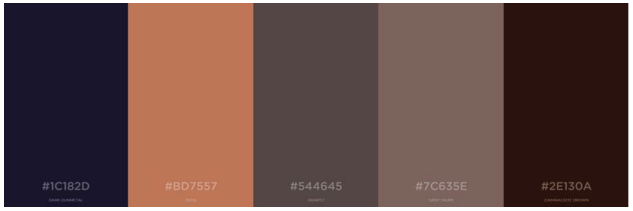
Musée de Beaux Arts; Bordeaux, France, *Photography of the American West*

Orange County Museum of Art, Newport Beach, CA, *California Landscape into Abstraction*

Southwest School of Art, San Antonio, TX, *Altering Space*

Occidental #26, Niagara Falls, NY, 1989 is part of Pfahl's series titled *Smoke*. See the other works in this series here. The smoke in each photograph is a different color. Visit https://coolors.co to create a color palette of the other photographs in the series. Here is the color palette we made for *Occidental #26, Niagara Falls, NY*, 1989.

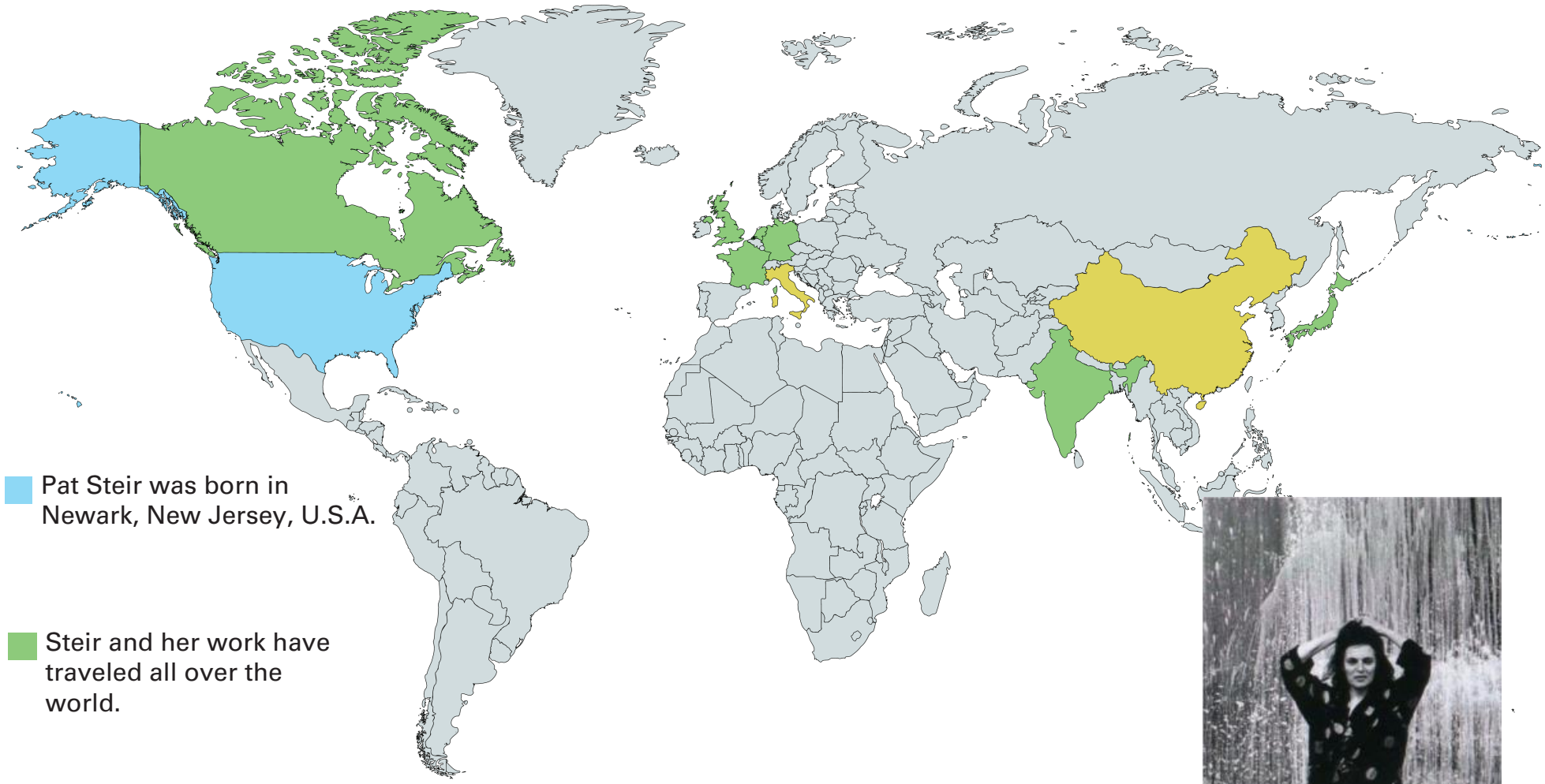
Create your own color palette of the photograph using colored pencil or paint.



Pat Steir (American, b. 1938), *Blue*, 2004. Pace Editions, Inc. (Publisher), Color silkscreen, 56 1/2 x 43 in (143.51 x 109.22 cm). Museum purchase, partial gift of Mary and Michael J. Tatalovich, Collection of the Haggerty Museum of Art, Marquette University, 2014.7.5.

Art in Context

Use this map with your students to explore Pat Steir's life and work.



Pat Steir was born in Newark, New Jersey, U.S.A.

Steir and her work have traveled all over the world.

Steir draws inspiration from Renaissance Painting (Italy) and Chinese paintings from the Tang and Song Dynasty.

✱ *Blue* was inspired by a waterfall. Can you figure out which waterfall inspired Steir? Explore a map of American waterfalls! Visit the website World of Waterfalls here.

Ralph Steiner (American, 1899 – 1986), *Tug and New York Skyline*, 1921 - 1922 / 1981. Gelatin silver print, 1 7/8 x 3 3/4 in (4.8 x 9.5 cm). Gift of Therese and Murray Weiss, Collection of the Haggerty Museum of Art, Marquette University, 90.15.2.

Art in Context

Use this timeline with your students to explore Ralph Steiner's life and work.

Ralph Steiner was born February 8, 1899, in Cleveland, Ohio, U.S.A.

American Event: Just two days after Steiner was born, Ohio experienced its lowest recorded temperature: -39°F (-39.4°C), in Milligan, Ohio (the record still stands!).

1899

Steiner graduated with a chemical engineering degree in 1921 from Dartmouth College in Hanover, New Hampshire. He then studied at the Clarence White School of Photography in New York City, New York, from 1921 to 1922.

1921

Fun fact: According to Dean Keith Simonton, author of *Creativity in Science: Chance, Logic, Genius, and Zeitgeist,* photography is a common hobby among "creative scientists."

1923

In 1923, Steiner became a freelance photographer in New York for advertisements and magazines.

1929

Steiner made moving-image films and photographs during his life. Watch his film *Ode to Water*, 1929, here.

American Event: The Wall Street Crash of 1929, also known as the Stock Market Crash of 1929 or the Great Crash, was a major stock market crash that occurred in late October 1929.

1933

In 1933, Franklin D. Roosevelt was elected president and introduced the New Deal. This was a series of programs, public works projects, financial reforms, and regulations that focused on the "3 Rs": relief for the unemployed and poor; recovery of the economy back to normal levels, and reform of the financial system to prevent a repeat stock market crash resulting in an economic depression.

1943

From 1943 to 1947, Steiner worked on films in Hollywood, California. What famous actors and actresses might Steiner have met while working in Hollywood?

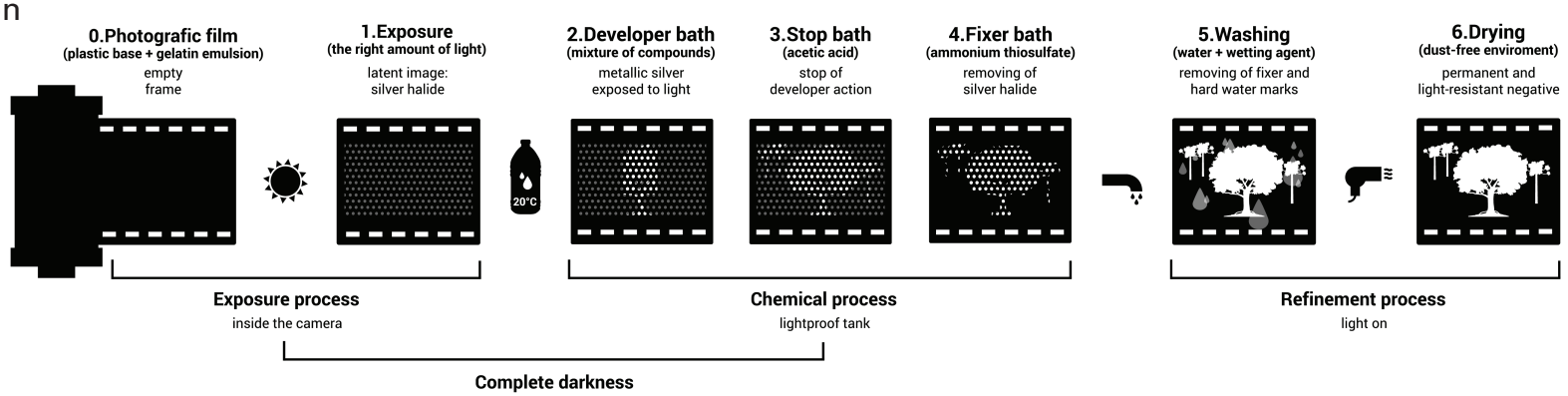
1970

In 1970, Steiner moved to Thetford, Vermont, U.S.A.

1986

Ralph Steiner died on July 13, 1986.

* The photographic process is a science! Creating a photographic print requires special paper, chemicals, and light. Learn more here with this photographic process image:

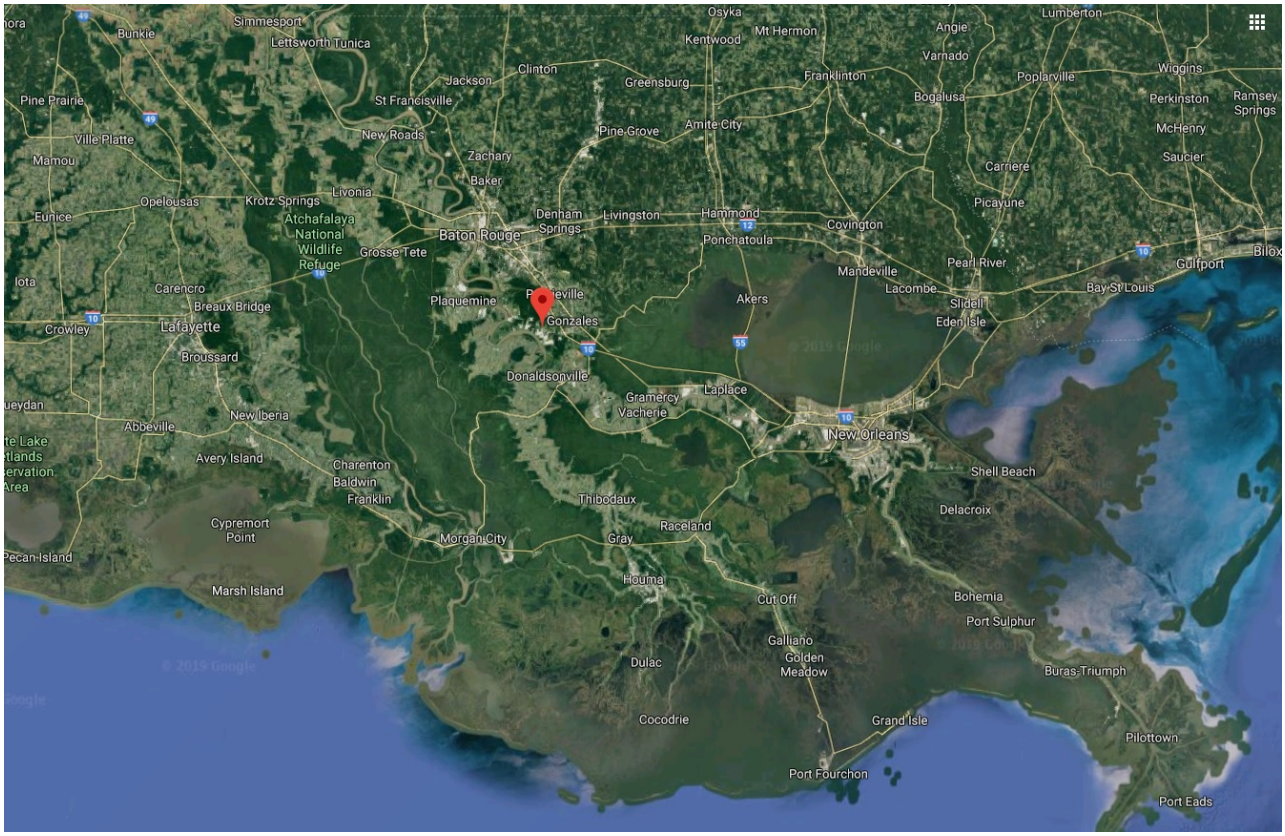


Richard Misrach (American, b. 1949), *Swamp and Pipeline, Giesmart, Louisiana*, 1998. Chromogenic color print, 27 5/8 x 35 in (70.17 x 88.9 cm). Museum purchase with funds from Miss Marion C. Wagner, Mrs. Jane W. Kranick, Mr. F. E. Wagner, and Mr. Robert Wagner (by exchange), Collection of the Haggerty Museum of Art, Marquette University, 2011.20.

Art in Context

What is a swamp?

Swamps are forested wetlands, characterized by specific types of trees and soil types. Swamps and lowland forests are very similar and often considered interchangeable. However , swamps are usually wetter for a longer period throughout the year and have deeper standing water than lowland forests. Source. Misrach's photograph was taken in Giesmart, Louisiana. See the red pin below for the exact location.



The **Atchafalaya Swamp,** Louisiana, is the largest swamp in the United States. It is near the lower section of the Mississippi River. Can you find where the Mississippi River starts and ends using Google Earth? How many states touch the Mississippi River?

Fun Fact

71% of the Earth's surface is water-covered but only a small percent of that water is freshwater. Source

Experience and Explore

Imagine Collage Activity

Nonpoint pollution that ends up in our waterways includes used oil poured into storm drains, soil washed from construction sites, grease from restaurants, fertilizer and pesticides washed off farm fields and city lawns, and cars cleaned in the driveway using **non-biodegradable** soap. Industrial waste is often dumped into our rivers.

What kind of nonpoint water pollution do you create? Where will it go?

Have students cut out images from magazines that depict items they use that might end up causing pollution if not disposed of correctly. Next print out copies of *Swamp and Pipeline, Giesmart, Louisiana*, 1998, for each student to create a collage. Students will glue their magazine images on top of *Swamp and Pipeline, Giesmart, Louisiana*, 1998, to create a pollution collage.

Make It Personal

What? Why? Activity

Water that is safe to drink is called **potable water**, in contrast to **safe water**, which can be used for bathing or cleaning. Potable and irrigation water are both scarce.

Nonpotable forms of wastewater generated by humans may be referred to as **gray water**, which means the water is treatable and can easily be made potable again. 50 to 80 percent of household wastewater is gray water. **Blackwater** generally contains **sewage** and other forms of waste which require more treatment to be made reusable. Toilets generate blackwater.

Why do we need to think about safe water here in Milwaukee? Use the image of the Great Lakes Basin to investigate how water pollution travels around the Great Lakes. The area of land that drains to a body of water is called a watershed. Milwaukee's three rivers are the Milwaukee, the Menomonee, and the Kinnickinnic. Each has its own watershed.

Learn more about our local Milwaukee watershed here.

Engage and Take Action

Make a Plan: Stronger Together

Imagine a world with no water pollution.

In the United States, the Environmental Protection Agency sets maximum levels for the 90 most commonly occurring water contaminants. If something happens to your water supply, your supplier has to contact you to let you know what precautions you should take. Filtration or distillation can make water **potable**.

What can you do to help? Create a list of actionable items with your students to help decrease their contribution to water pollution. Find examples here.

Make sure to post the list somewhere in your classroom, or track one item from your list each week. Make charts or graphs and CELEBRATE everyone's efforts, you can also join the EcoLiteracy challenge with your students or school here.

Ride the Wave

Organize a classroom visit led by a HMA educator. Choose to do one lesson, or all three! Email Christine.Fleming@marquette.edu to find out more.

Essential Questions:

- How does photography inform our relationship to the environment?
- How does art inspire action?

Deep Dives

Family Learning Activity (Available in both Spanish and English)

Check Out: World's Largest Lesson Clean Water for All

Watch the Liquid Gold music video from True Skool here.

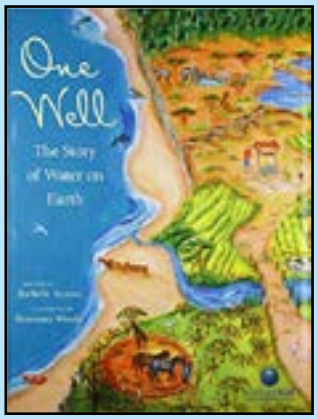
Additional Resources

Milwaukee Community Map and MCM Teachers Guide

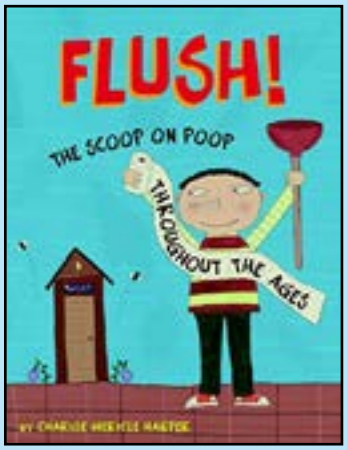
"What is the impact of beach litter?" lesson plan (6–8 and 9–12)

Book Recommendations

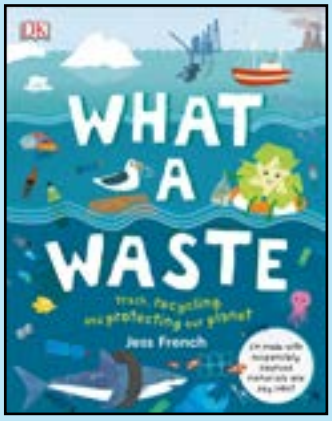
Find them at a library near you!



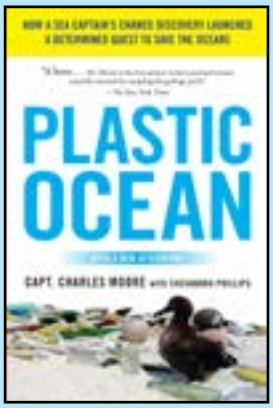
One Well: The Story of Water on Earth
Author: Rochelle Strauss
Illustrator: Rosemary Woods



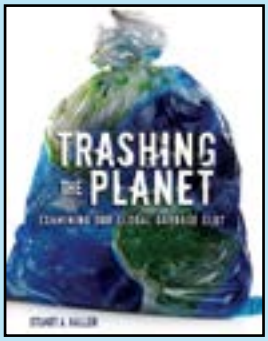
Flush!: The Scoop on Poop Throughout the Ages
Author: Charise Mericle Harper



What a Waste: Trash, Recycling, and Protecting our Planet
Author: Jess French



Plastic Ocean: How a Sea Captain's Chance Discovery Launched a Determined Quest to Save the Oceans
Authors: Charles Moore and Cassandra Phillips



Trashing the Planet: Examining Our Global Garbage Glut
Author: Stuart A. Kallen

Chapter 4

Water Properties

6th grade – 12th grade

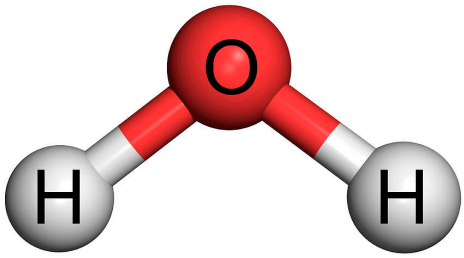
Chapter Objective

Students will learn about the many unique qualities of water through both scientific and artistic investigations.

Supported Standards

Science, SCI.LS1: Students use science and engineering practices, crosscutting concepts, and an understanding of structures and processes (on a scale from molecules to organisms) to make sense of phenomena and solve problems. (WI Standards for Science, adopted 2017)

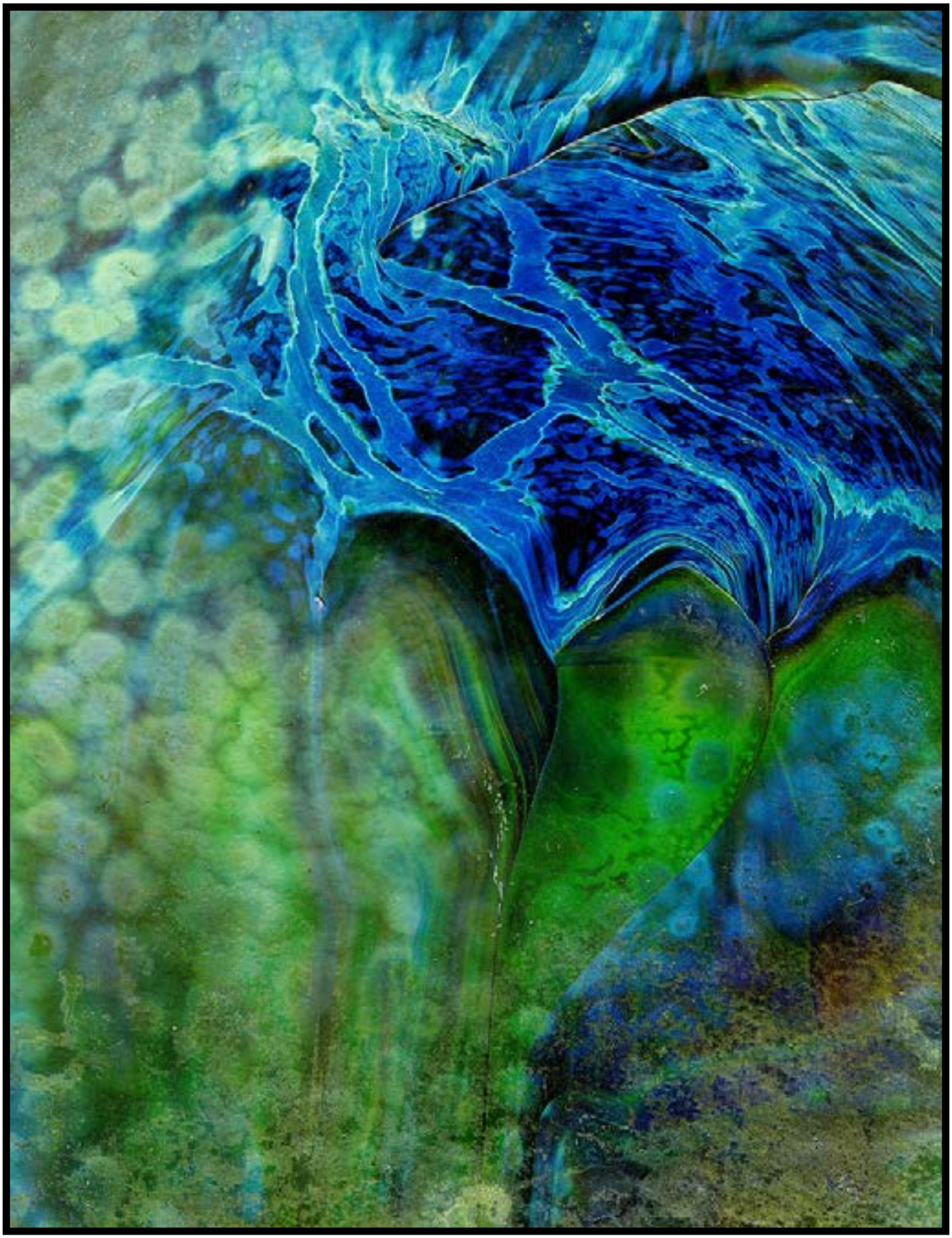
Visual Art, Grade 6, VA:Cr1.1.6a: Combine concepts collaboratively to generate innovative ideas for creating art. (National Core Art Standards, created 2014)



Water is a necessity for all life on Earth. It is present in the atmosphere, and is even present inside our bodies. We use it every day in everything we do.

The formula for water is H_2O, which means that two hydrogen (H) atoms and one oxygen (O) atom combine to form one **molecule** of water. Water exists in three different states on Earth—solid (ice), liquid (water), and **gas** (water vapor/steam).

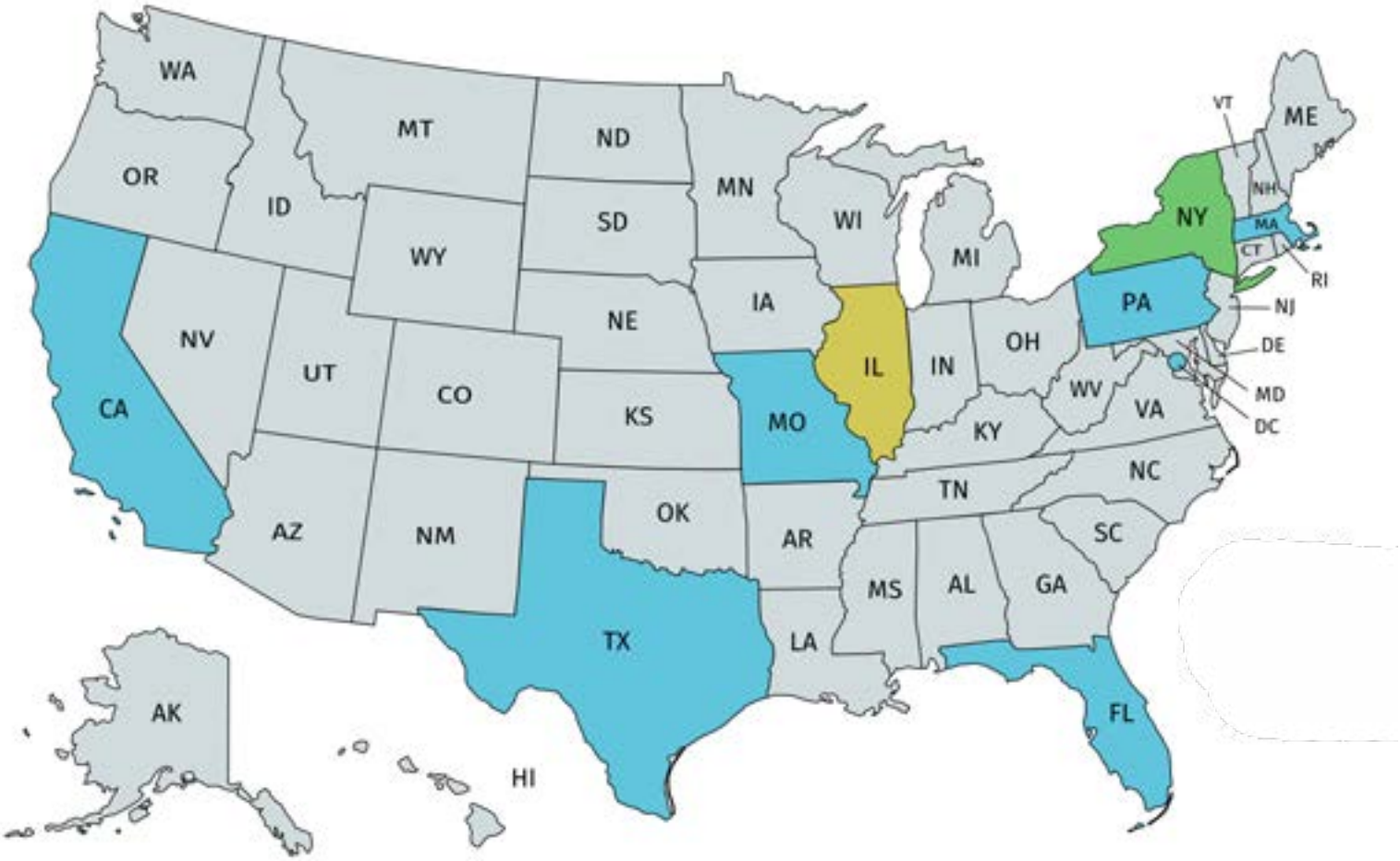
Back to the Table of Contents



John D'Agostino (American, b. 1975), *The Arms of Undertow*, 2008. Digital print on canvas, 30 x 24 in (76.2 x 61 cm). Gift of the artist, Collection of the Haggerty Museum of Art, Marquette University, 2009.5.1.

Art in Context

Use this map with your students to explore John D'Agostino's life and work.



John D'Agostino was raised in Queens, New York, U.S.A.

D'Agostino received a B.S. from Northwestern University, Illinois, U.S.A.

Where in the U.S.A. is D'Agostino's art?

* What is an undertow? Why do you think D'Agostino titled his artwork *The Arms of Undertow*? Create your own undertow painting.

Roy Lichtenstein (American, 1923 – 1997), *Morton A. Mort*, 1980. Woodcut with embossing, 22 3/4 x 32 1/2 in(57.78 x 82.55 cm). Museum purchase with funds from Mrs. Jean Messmer in memory of Dr. Charles Clemens Messmer, Collection of the Haggerty Museum of Art, Marquette University, 2012.3.

Art in Context

Use this timeline with your students to explore Roy Lichtenstein's life and work.

1923

Roy Lichtenstein was born in New York City, New York, U.S.A., on October 27, 1923

1940

Lichtenstein studied painting and drawing at the Art Students League of New York with Reginald Marsh the summer before he studied at The Ohio State University.

1943–1945

Lichtenstein's studies were put on hold and he was drafted for WWII. He sketched throughout his time in Europe, seeing action in France, Belgium, and Germany as part of the infantry.

1946

Lichtenstein completed his BFA at The Ohio State University and was invited to join the faculty as an instructor.

1949

While teaching at The Ohio State University, Lichtenstein received his master's degree.

1960

September 1960, Lichtenstein became an assistant professor at Douglass College in New Brunswick, New Jersey.

1990s

Lichtenstein created three major series involving his interest in solving pictorial problems.

1997

On September 29, 1997, Lichtenstein died in New York City, New York, U.S.A.

* Learn more about Lichtenstein here.

Frank Paulin (American, b. 1926), *New York (Central Park, man in boat)*, 1956. Gelatin silver print, 11 x 14 in (27.9 x 35.6 cm). Gift of Bruce and Silke Silverstein, Collection of the Haggerty Museum of Art, Marquette University, 2009.15.17.

Art in Context

Use this timeline with your students to explore Frank Paulin's life and work.

Frank Paulin was born in Pittsburgh, Pennsylvania, U.S.A., in 1926.

Fun Fact: A. A. Milne publishes his first collection of stories about Winnie-the-Pooh in 1926.

1926

Paulin joined Whitaker-Christiansen Studio based in Chicago at 16 years old as an apprentice in photography and fashion illustration.

1942

1944

Paulin joined the army and spent two years in Europe during WWII as a member of the Signal Corps. While in Germany, he took photographs of the wartime devastation.

1946

Paulin enrolled at the Institute of Design in Chicago. By the end of the 1950s he also studied at the New School in New York under the art director Alexey Brodovitch.

1953

Paulin continued work as a freelance fashion illustrator in New York. Most of his time was spent with work, so he walked the streets at night and became interested in street and documentary photography.

1957

Paulin's first solo show was held at the iconic Limelight Gallery.

Frank Paulin's work has been exhibited in many well-known institutions, such as the Milwaukee Art Museum, Museum of Modern Art, Whitney Museum of American Art, and the Yale University Art Gallery.

2003

A book was published about Frank Paulin titled *Frank Paulin: Out of the Limelight* by author Max Kozloff and contributed to by Massimo Vignelli. The book features his artwork created over four decades.

Watch this interview with Frank Paulin to learn more about his work here.

Barbara Morgan (American, 1900 – 1992), *Mono Lake*, 1931. Woodcut, 10 5/8 x 13 in (26.99 x 33.02 cm). Gift of Lloyd and Janet Morgan, Collection of the Haggerty Museum of Art, Marquette University, 91.3.70.

Art in Context

Barbara Morgan features Mono Lake in a few of her artworks. Mono Lake is a **saline soda lake** in Mono County, California. Click here to learn more about the chemistry of Mono Lake.

Experience and Explore

Narrative Storyboard Activity

Warm up: Art is often used to narrate a story. Have students use the Narrative Storyboard worksheet on the next page to create a narrative using Paulin's *New York (Central Park, man in boat)*, 1956.

Make It Personal

Water has many interesting properties:

- Water clings to itself! Water molecules are attracted to one another through **cohesion**.
- Water is called a polar (like +/- poles of a magnet) compound because it contains oxygen, which holds electrons within a molecule tighter than most other elements.
- Water takes up space. Liquid water takes on the shape of its container. It may look different in a tall thin vase as compared to the same water spilled in a flat puddle, but the volume of the liquid stays the same.
- Water has weight, and the weight of water is responsible for **water pressure**.
- The way water molecules are attracted to each other and form a bond creates a skin-like barrier between air and the water molecules below called **surface tension**.
- Solids respond differently when mixed with liquid water. While some dissolve, like sugar and salt, others stay separate, like sand or butter. When substances combine to form a uniform mixture, they are called a **solution**.

Explore solutions in your classroom with the "To Dissolve or Not To Dissolve" lesson plan here.

Narrative Storyboard Worksheet

Use your imagination to create a narrative around the artwork. What happened before, what happens next?

Beginning	Middle	End
		

Draw images in the large squares, and write descriptions of each part of your story in the rectangles.

Frank Paulin (American, b. 1926), *New York (Central Park, man in boat)*, 1956. Gelatin silver print, 11 x 14 in (27.9 x 35.6 cm). Gift of Bruce and Silke Silverstein, Collection of the Haggerty Museum of Art, Marquette University, 2009.15.17.

Narrative Storyboard Worksheet

Use your imagination to create a narrative around the artwork. What happens next ?

Beginning	Middle	End
		

Draw images in the large squares, and write descriptions of each part of your story in the rectangles.

Frank Paulin (American, b. 1926), New York (Central Park, man in boat), 1956. Gelatin silver print, 11 x 14 in (27.9 x 35.6 cm). Gift of Bruce and Silke Silverstein, Collection of the Haggerty Museum of Art, Marquette University, 2009.15.17.

Narrative Storyboard Worksheet

Use your imagination to create a narrative around the artwork. What happened before?

Beginning	Middle	End
		

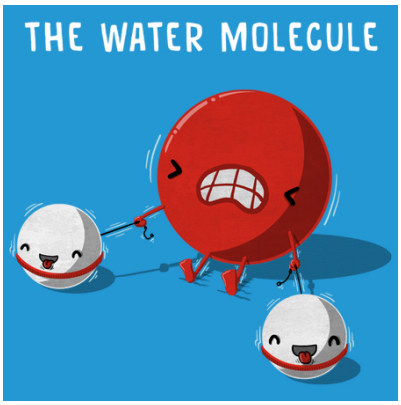
Draw images in the large squares, and write descriptions of each part of your story in the rectangles.

Frank Paulin (American, b. 1926), New York (Central Park, man in boat), 1956. Gelatin silver print, 11 x 14 in (27.9 x 35.6 cm). Gift of Bruce and Silke Silverstein, Collection of the Haggerty Museum of Art, Marquette University, 2009.15.17.

Focusing In Activity

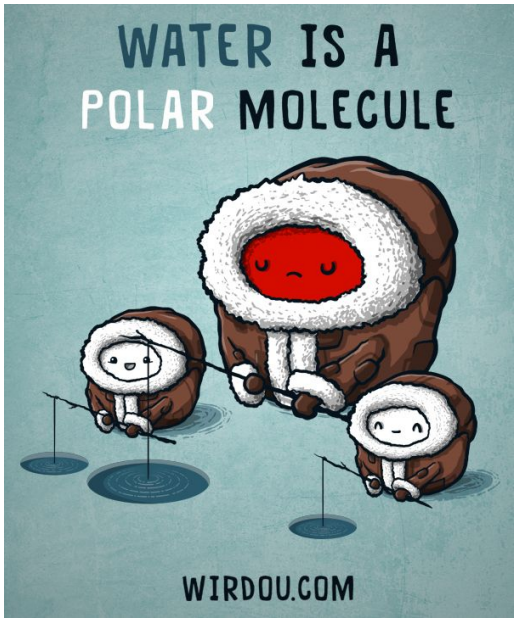
Give students time to look at examples of how scientists depict a water molecule with a partner (page 50).

Next look at some pop culture depictions of a water molecule. Discuss similarities and differences in scientific renderings as a class.



Students will then create their own cartoon version of WATER with a partner.

How will you display the final cartoons in your classroom?



Ask a local expert!

In nature, water is never totally pure. Why? Ask a local expert! Send Mike Dollhopf, Marquette University Water Quality Center, an email at michael.dollhopf@marquette.edu to find out.

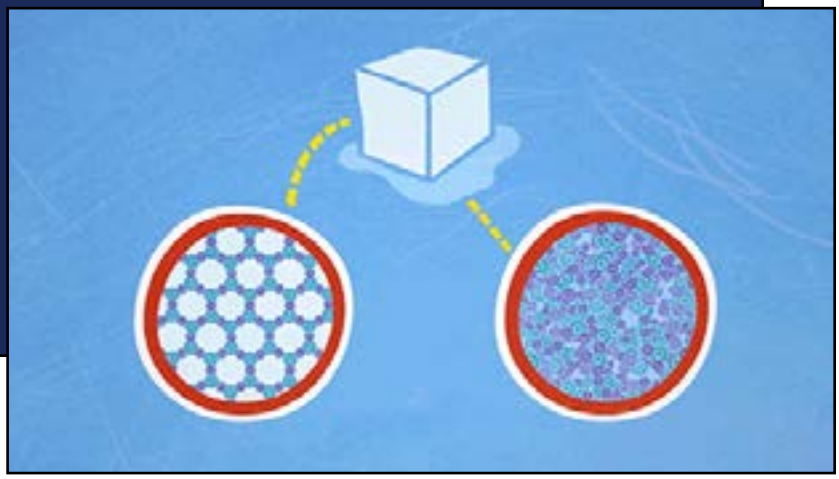
Engage and Take Action

EcoLiteracy Challenge

Join the EcoLiteracy challenge with your students or school here.

Fun Fact

Because water is less dense in its solid state than in its liquid state, ice floats on water. When water solidifies, it forms an open **crystalline lattice** causing it to take up more volume than the same number of water molecules that randomly tumble together when water is in its liquid form. This is a unique property of water because, for most other pure substances, solids are heavier than liquids.



Click here to see the above image as an animated gif and compare with John D'Agostino, *The Arms of Undertow*, 2008.

Ride the Wave

Organize a classroom visit led by a HMA educator. Choose to do one lesson, or all three! Email Christine.Fleming@marquette.edu to find out more.

Essential Questions:

- What is abstract art?
- How is water depicted in abstract art?

Deep Dives

Check out a "Properties of Water" lesson plan (5th-7th grade). Learn more about molecules with Britannica Kids here. Explore Water Properties and Facts You Should Know here.