

ANCHORAGE MUSEUM

ALASKA IS: HOW WATER IS LIFE



Untitled

Ink, paper

Joseph S. Rychetnik Collection, Anchorage Museum, B12017.024.2371



UNIT AT A GLANCE

Investigate our relationship to water through writing and activities.

Science: Students will view two photographs from the Anchorage Museum collection and use observational skills to describe properties of water.

Language Arts: Students will view two photographs from the Anchorage Museum collection and write poetry and respond to writing prompts relating to water.

Social Studies: Students will examine two photographs from the Anchorage Museum collection, research ways in which people and societies interact with water, and hold mock proposals for water-related projects.

STANDARDS

Alaska Science Standards:

MS-PS1-4 Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

Alaska History Standards:

B.1.b comprehend the forces of change and continuity that shape human history through the following persistent organizing theme human: communities and their relationships with climate, subsistence base, resources, geography, and technology

B.3 recognize that historical understanding is relevant and valuable in the student's life and for participating in local, state, national, and global communities

C.4 use historical perspective to solve problems, make decisions, and understand other traditions

Alaska Geography Standards:

A.5 evaluate the importance of the locations of human and physical features in interpreting geographic patterns

B.7 understand that a region is a distinct area defined by one or more cultural or physical features

C.3 recognize the concepts used in studying environments and recognize the diversity and productivity of different regional environments.

E. a student should understand and be able to evaluate how humans and physical environments interact.

F. utilize geographic knowledge and skills to support interdisciplinary learning and build competencies required of citizens.

MATERIALS

Extension activity:

Photograph 1: Ward Wells Collection, Anchorage Museum; B1983.091.S3017.030

Photograph 2: Lu Liston Collection, Anchorage Museum; B1989.16.2033.5

Photograph 3: Joseph S. Rychetnik Collection, Anchorage Museum; B2017.024.231

Disposable cameras

Scissors

Construction paper/poster board

Coloring utensils



Science:

Plastic pipette
Wax paper
Paper bowl
Paperclip
Dish soap
Toothpick
Paper cups (2)
String
Masking tape
Food coloring

Language Arts:

Writing utensils
Paper

Social Studies:

Writing and coloring utensils
Paper
Glue
Scissors

KEY TERMS

<i>tika'a</i>	Dena'ina term for ocean
<i>nuti</i>	Dena'ina term for salt or salt water
<i>k'etnu</i>	Dena'ina term for river or stream
<i>alaŋuŋ</i>	Unangaŋ term for open ocean
<i>kuik</i>	Central Alaskan Yup'ik term for river
<i>maritime</i>	concerning, or with regard to, the sea
<i>cohesion</i>	the attraction or force of similar molecules to stick together
<i>adhesion</i>	the attraction or force of unlike molecules to stick together
<i>surface tension</i>	cohesion creates a 'solid-like' state upon which light-weight or low-density materials can be placed without sinking
<i>observation</i>	the action or process to gain information by using one's senses (i.e. sight, hearing, touch, smell, and taste)
<i>(poetic) meter</i>	the rhythmic patterns of a verse, or lines of a verse, in a poem
<i>spoken word poetry</i>	a type of oral poetry characterized by its rhythmic and performative qualities
<i>metaphor</i>	an abstract representation or symbol for something else



CLOSE-LOOKING

TIME FRAME

Approximately 30 minutes

MATERIALS

Photograph 1: Ward Wells Collection, Anchorage Museum; B1983.091.S3017.030

Photograph 2: Lu Liston Collection, Anchorage Museum; B1989.16.2033.5

Photograph 3: Joseph S. Rychetnik Collection, Anchorage Museum; B2017.024.231

DIRECTIONS

1. Begin by looking closely at provided photographs. Use the questions below to guide discussion.

[30 min.]

CLOSE-LOOKING: Look closely, quietly at the objects for a few minutes.

OBSERVE: Share your observations about each photograph.



Photograph 1: Ward Wells Collection, Anchorage Museum, B1983.091.S3017.030

ASK: What do you notice about this image?
Describe what you see in this image?
Where might have this photo been taken?
Why do you think this photo was taken?
What does this remind you of?
What more can you find?



Photograph 2: Lu Liston Collection, Anchorage Museum, B1989.16.2033.5

ASK: What details do you notice in this image?
What might the person in the image be doing?
What might let you know when this picture was taken?
How would you describe the mood of this image?
What does this remind you of?
What more can you find?



Photograph 3: Lu Liston Collection, Anchorage Museum, B1989.16.2033.5

ASK: What details do you notice in this image?
What might the person in the image be doing?
What time of year might this photo have been taken?
How would you describe the mood of this image?
What does this remind you of?
What more can you find?

DISCUSS: Use the [20 Questions Deck](#) for more group discussion questions about the photographs.



EXTENSION ACTIVITY: WE ARE WHERE WATER IS

TIME FRAME	Approximately 2 class sessions
MATERIALS	Photograph 1: Ward Wells Collection, Anchorage Museum; B1983.091.S3017.030 Photograph 2: Lu Liston Collection, Anchorage Museum; B1989.16.2033.5 Photograph 3: Joseph S. Rychetnik Collection, Anchorage Museum; B2017.024.231 Disposable cameras Scissors Construction paper/poster board Coloring utensils
DIRECTIONS	<p>1. Water is ubiquitous in the Alaskan landscape. Invite students to discuss activities that people do in Alaska that take place in, or require water. Write examples provided by students on the board for reference. [15 min.]</p> <p>2. Divide students into two to three groups and invite them to sketch bodies of water associated with these activities onto large sheets of posterboard or paper. [30 min.]</p> <p>3. Inform students that they will stage photographs of themselves engaging in these activities with their drawings as the backdrop. Pass out cameras and invite students to take pictures of themselves in gear at home as they would if they were engaging in an activity relating to water. [5 min.]</p> <p>4. Once students have taken photos, develop the photographs and return them to students in the next learning session. Invite students to quickly share the activities they chose to photograph themselves doing. Inform them that they will cut out the backgrounds of their photos and superimpose themselves onto their previous drawings with glue. [10 min.]</p> <p>5. Once glue is dry, invite students to add additional drawings onto the bodies of water that they previously drew. As they draw, ask students: What do they enjoy about the activities that they are portraying? How important is the presence of water to these activities? How might the activities they portray be different without the presence of water? [20 min.]</p>

SCIENCE: PROPERTIES OF WATER

TIME FRAME	Approximately 40 minutes
MATERIALS	Plastic pipette Wax paper Paper bowl Paper clip Dish soap Toothpick Paper cups (2)



String
Masking tape
Food coloring

DIRECTIONS

1. Explain to students that in groups of two to three, they will observe the properties of adhesion and cohesion in water through three experiments. Review the following terms and definitions with students in the KEY TERMS section: adhesion, cohesion, surface tension, and observation.

[2 min.]

2. For the first experiment, students will use the pipette to place a droplet of water onto wax paper. Afterward, invite students to find ways to move the droplet of water around the wax paper.

[2 min.]

3. Invite students to share observations about the shape and behavior of the droplet and encourage them to relate their observations to the properties of cohesion. Afterward, encourage students in discussion groups to make connections with past experiences with which they might have seen similar droplets of water in nature.

[5 min.]

4. For the second experiment, pass out paper clips and paper bowls and have students fill one paper bowl with water and invite students to float a paper clip on the surface of the water.

[2 min.]

5. Encourage students to share their observations and successes and challenges they experienced and ask: How might the property of cohesion relate to their observations of the floating paperclip?

[5 min.]

6. Invite students to share experiences they have had with cohesion and surface tension (swimming at the surface of a pool or fully submerged, insects walking on water, rain on a mesh tent screen for example). After sharing, have students mix liquid dish soap in a separate bowl of water. Dip a toothpick in this solution. With the paperclip floating, tap the soapy toothpick to the water surface near the paperclip. Encourage students to share their observations about what happens to the paperclip and ask: How might cohesion and adhesion be responsible for what happened to the paperclip?

[5 min.]

7. For the third experiment, share with students that they will fill an empty cup by making water follow a string from a filled cup. Encourage students to share hypotheses for how and why this will work.

[5 min.]

8. Students will fill a cup with water and place one end of a string into the water with the other end of the string taped to the center of the base inside of another paper cup. Instruct students to add food coloring into the water to help with observing what will happen. While keeping the loose end of string submerged in water, instruct students to slowly raise the filled cup higher than the empty one and pour water from the filled cup onto the string and into the other cup. As students pour, invite them to make observations.

[7 min.]

9. Once finished, invite students to compare the results of the experiment with their hypotheses and to share with each other why they think cohesion and adhesion made



this experiment possible.
[7 min.]

ASSESSMENT

Students will be assessed based on participation in class discussion and the completion of the activity.

LEARN MORE

PROPERTIES OF WATER

Water is an essential ingredient for life on Earth, and Alaska has plenty of it. Including islands, Alaska has over 30,000 miles of shoreline. There are an estimated 100,000 glaciers, making up about 5% of the state, and the Yukon River, is the third longest river in the United States. With so much water, it is important to look at the properties of water and what makes this common resource so unique.

Water, also known as H₂O, is a molecule made up of two hydrogen atoms and one oxygen atom. One drop of water contains lots of individual molecules, which are held together by strong molecular bonds, and, in the case of water, hydrogen bonds. This particularly strong bond allows water molecules to stick together very well. Cohesion between molecules leads to surface tension, where materials can lie on the surface of a liquid without sinking. In addition to water molecules sticking together, they also are good at sticking to other molecules, a property called adhesion.

LANGUAGE ARTS: RHYTHMIC POETRY

TIME FRAME	Approximately 45-60 minutes
MATERIALS	Paper Writing utensils
DIRECTIONS	<ol style="list-style-type: none">1. Discuss as a class the idea of rhythm in poetry. Invite students to share how they might be able to create rhythms with words. Encourage students to tap on their hands or on a soft surface as a guide when going over examples of rhythm. [10 min.]2. Invite students to make connections to rhythmic patterns and water. As a class, make a list of types of water and rhythmic patterns they associate with it. For example, bubbles in water can be calm and spontaneous, but waves in a storm can be irregular and turbulent. [5 min.]3. Engage with students to come up with ideas as a class about how to convey these themes through poetic rhythm. Invite students to take notes and sketches to map their thinking process. [10 min.]4. Invite students to write a short poem on water incorporating rhythm associated with a type of water from the earlier discussion. [15 min.]5. Once finished, invite students to present their work if they feel comfortable. Encourage students to try to find the rhythms in each piece presented. [10 min.]6. If time allows, encourage students to discuss their creation process. Ask: What did you find challenging?, What was new? What was rewarding? [15 min.]



ASSESSMENT

Students will be assessed based on participation in class discussion, completion of activity, and presentation of their project to the class.

LANGUAGE ARTS: WATER WEB WRITING

TIME FRAME	Approximately 45 minutes
MATERIALS	Paper Writing utensils
DIRECTIONS	<ol style="list-style-type: none">1. On a board, write the word 'water.' Invite students to share a total of four to six words that they associate with water. For each new word, draw a line connecting it to the word 'water.' From each new word, draw two lines and invite students to provide two words they associate with that word. Repeat this process twice. [10 min.]2. Invite students to copy this diagram onto a sheet of paper. [5 min.]3. Once students have copied the diagram from the board, prompt students to trace a path from the one word at the edge of the diagram to another. [5 min.]4. Invite students to write a short story or a series of short poems incorporating each word from the path that they traced. [30 min.]5. Invite students to discuss their works with a partner. Encourage students to come up and present their work if they choose to do so. [10 min.]

ASSESSMENT

Students will be assessed based on participation in class discussion, completion of activity, and presentation of their project to the class.

LEARN MORE

WATER, POETRY, AND METAPHOR

Water constitutes a large part of our world. It is easily accessible in some regions, and less so in others. These varying degrees of access to water shape how people perceive it. For regions where liquid water is plentiful, association of water with abundance are common. Conversely, in places in which water overall is scarce, there exists an emphasis on water's relative value. As a vital component for life, poets and writers have often drawn and continue to draw from water as a source of inspiration when creating their work.

In the west, the Romantic Era and Transcendentalist movements of the 1800s gave way to many writers and poets of this period describing nature and natural elements such as water as being grand and separate from people. In these works, writers and poets emphasize the vastness of oceans, rivers, and other bodies of water to create a sense of wonder.

Today, water continues to inspire people to create poetry. Intersections of poetry with activism often result in poems that raise awareness on issues relating to water such as water scarcity, water pollution, and access



rights.

MEDIA:

TED-Ed - [What makes a poem ... a poem? - Melissa Kovacs](#)

Button Poetry - [Rudy Francisco - When the Water Is Gone](#)

TED-Ed - ["To Make Use of Water" by Safia Elhillo](#)

PBSNewsHour - ["I Told the Water," by Tarfia Faizullah](#)

SOCIAL STUDIES/HISTORY: WATER MANAGEMENT

TIME FRAME	3 class sessions
MATERIALS	Writing and coloring utensils Paper Glue Scissors
DIRECTIONS	<ol style="list-style-type: none">1. Discuss with students ways in which people interact with water. Prompt students by writing examples on the board such as swimming pools, packaging bottled water, or watering lawns. Continue to write additional examples from students. [10 min.]2. Invite students to name communities in which water is abundant, scarce, or frozen. Write examples in columns on the board. [10 min.]3. Place students into pairs or small groups of three and invite them to choose a community to represent. Encourage students to consider how the relative abundance of water may influence projects for their chosen communities. [5 min.]4. Tell students that they will be picking a water-related project for their community. Each group will prepare a proposal for why their project should receive funding. Explain that those not presenting will be evaluating whether or not the project should receive funding. [30 min.]5. In the next learning session, invite each group to create diagrams, posters, or pamphlets to accompany their project proposal. [45 min.]6. Once posters and diagrams are finished, invite students to present their proposals. Encourage students who are not currently presenting to ask questions to presenters during and after their presentation. At the end of each presentation, ask groups if they would support these projects. If not, ask what students would change about the presenters' current proposal for them to warrant funding. [30 min.]7. At the end of all presentations, discuss with students: What were some considerations that you learned? How might the communities chosen be similar or different from your own? [10 min.]



ASSESSMENT

Students will be assessed based on participation in class discussion, completion and presentation of the proposal to the class.

SOCIAL STUDIES: RIGHT TO WATER

TIME FRAME	3 class sessions
MATERIALS	Writing and coloring utensils Paper Glue Scissors
DIRECTIONS	<p>1. Discuss with students ways in which people interact with water. Ask: what are ways in which water quality affects our daily lives? Prompt students with questions regarding the ways in which we use water and discuss how important water quality is to these activities. [20 min.]</p> <p>2. Share and discuss the article How Tuluksak Residents Are Getting Drinking Water Now. Prompt students to research other examples at home in which water access or quality may be compromised. [20 min.]</p> <p>3. After having researched events or methods in which water access or quality may be affected, ask students to brainstorm ideas with a partner on what may be needed to resolve these types of issues at a personal and community level. Invite students to share their responses if they feel comfortable in doing so. [15 min.]</p> <p>4. In groups, invite students to craft posters in groups that call for action to a specific situation discussed in the previous step. For example, if an area needs better water quality, a poster could demand a new water treatment plant, or for a solution to the cause of pollution. Encourage students to collaborate in groups to make slogans, design images, and their arguments for supporting their particular cause. [2 class sessions.]</p> <p>5. After students have finished creating their posters, invite them to present their work to the class and discuss how their posters draw attention to the issue they have chosen as well as the course of action they hope to have with their posters. [45 min.]</p> <p>6. Once presentations are finished, discuss with students what they found surprising in their research. Encourage them to communicate the similarities and differences between group projects. [20 min.]</p>

ASSESSMENT

Students will be assessed based on participation in class discussion, completion and presentation of the proposal to the class.



LEARN MORE

WATER, TRAVEL, AND TOURISM IN ALASKA

Though traveling through Alaska on land or air is possible in most cases, water travel is sometimes the most viable option. People most easily traverse waterways by kayak, boat, water taxi, or ferry. Sleds, snowmachines and snowshoes are also relevant when crossing frozen waterways and snowy paths.

Alaska's Indigenous peoples have created and continue to create sustainable technologies for traveling on and through water. Oiling gut and hide provides waterproof materials such as gut parkas and kayak skins. Snowshoes and sleds, present in virtually all Alaska Native cultures, allow for highly mobile travel for large groups of people on snow and ice.

Alaska's history with water and tourism as a western enterprise has its origins in the late 1800s with American naturalists and scientists. People like John Muir would often write promotional articles to encourage others in his field to take steamboats into Glacier Bay in Southeast Alaska to visit and study glaciers. Today, glacier tour companies are found throughout Alaska.

As a means of increasing transportation and business, the Alaska state government began the Alaska Maritime Highway in 1963. This highway comprises over 30 ferries that reach up to 31 ports along the Alaskan coast and parts of Canada. On a smaller scale, coastal towns have water taxi services to move people within and between communities, as well as to locations that are otherwise inaccessible.

WATER ACCESS AND RIGHTS IN ALASKA

Water access and rights are an important part of all communities. Laws pertaining to water and its use determine whether communities have access to waterways for navigation, transport, and water storage for purposes of sanitation and water consumption.

The Winters Doctrine, a decision reached by the United States Supreme Court in the 1908 case *Winters v. United States* largely affects water access and rights in Indigenous communities throughout the United States. This decision establishes that surface and subsurface water required for land that Congress set aside for Indigenous peoples is guaranteed for that land, regardless of how long water goes unused. In Alaska, only the Annette Island Reserve in Southeast Alaska and individual Alaska Native allotments stemming from the *Alaska Native Allotment Act* fall under this jurisdiction, leaving much to Alaska State law to interpret water rights everywhere else in the state.

The legal framework for Indigenous water rights, access, and usage in Alaska rests on the results and interpretations of various cases such as the Winters Doctrine, the 1906 *Alaska Native Allotment Act*, the *Alaska National Interest Lands Conservation Act (ANILCA)*, and the *Katie John Cases*. As most of these cases primarily have to do with rights more relevant to hunting, fishing, and land rights, the exact circumstances of water rights can sometimes lead to conflict between Alaska State law and federal law, needing greater clarification. For non-Indigenous water and access rights, the Department of Natural Resources (DNR) issues permits for water use and water reservation, with priority given to earlier applicants in times of a shortage. In these cases, an applicant's right to water may expire if not used for a long period of time.

WATCH:

Smithsonian's National Museum of Natural History - [The Athabascan Snowshoe Makers Residency](#)
Indie Alaska - [I am a Water Taxi Captain](#)

READ:

Alaska.org - [Alaska Glaciers: Then & Now](#)
National Park Service - [Kaasteen](#)
University of Alaska Anchorage - [Understanding Water Rights in Alaska](#)
Native American Rights Fund - [Katie John V. Norton](#)
Alaska Department of Natural Resources - [Water Rights in Alaska](#)
KYUK - [How Tuluksak Residents Are Getting Drinking Water Now](#)



LEARN:

Anchorage Museum - [Northern Waters](#)

Anchorage Museum - [Science Passport: Sink - Properties of Water](#)

