

OUR WATER: WATERSHED AND A FILTER 3-5 (LESSONS 1-2)

Elder Quote/Belief:

“...you know when he (Bill Smith) said what his mom told him, that water connects all people. I would like to see the younger kids know how important our water is and to keep it clean and safe. Because clean water is what sustains us- it sustains the seal, sea lions and fish... and keeps us going.” - Patrick Sweeny Selanoff (Valdez, Alaska)

Grade Level: 3-5

Overview: Our ancestors throughout the Chugach Region have collected water from different areas in the landscape. Water for drinking, cooking, bathing and cleaning was hauled year round from springs, clean streams, and lakes. Do you think different water sources were used for different activities? Such as drinking water or bathing water? How did our ancestors know the water was clean? How was water collected and transported in your community. Clean water is vital for our health and the health of the animals we depend upon.

Standards:

<i>AK Cultural:</i>	<i>AK Content:</i>	<i>CRCC:</i>
A (4) Culturally- knowledgeable students are well grounded in the cultural heritage and traditions of their community	C (3) Develop an understanding that all organisms are linked to each other and their physical environments through the transfer and transformations of matter and energy.	G (7) Students should be knowledgeable about environmental and natural impacts of the area.

Lesson Goal: For students to understand that our water near and around our communities have long been vitally important for our health, and habitats.

Lesson Objective(s): Students will:

- Learn the way nature successfully filters water.
- Will make a natural water filter and conduct experiments.
- Learn about objects that were traditionally used to help carry water.

Vocabulary Words: Sugt'stun Dialects

English:	PWS:	Lower Cook Inlet:	Eyak:
Water		meq	giyah
Moss		uruq	k'uhdL
Box		yaasiik	Le't'
Pot Cooking, Basket			Uya'X k'udAqa't'g

Materials/Resources Needed:

- Filter Materials:
 - Two litter plastic bottles (cut in half) or smaller water bottles
 - Fine sand (one cup per experiment)
 - Course sand (one cup per experiment)
 - Pebbles (one cup per experiment)
 - Coffee filter or cheese cloth
 - Rubber bands
 - Two- one cup containers for mixing water
 - Water
 - Towels for clean up
 - Bentwood box pattern

- Pollution Materials:
 - Dirt
 - Leaves / Grass
 - Cooking Oil (vegetable)
 - Glitter
 - Pepper
 - Food Dye

Website:

- Water Filter Lesson Plan from Earth Day.org
 - <http://www.earthday.org/wp-content/uploads/5-8-Lesson-Plan1.pdf>

Teacher Preparations:

- Locate large two litter bottle or small individual water bottles.
 - Pre-cut bottles, cut off the top half or one-third of the way down on each bottle
 - Set aside for later
- Gather the rest of the materials (listed above)
- Review lesson plan at EarthDay.org for more information
- For last activity, make each student a copy of the bentwood box pattern

Opening:

Our traditional regional communities were established near clean fresh water access. The water that flows through and around our communities can travel many miles before it reaches the ocean. Water is the single element that we all need to live. How did our ancestors know the water was clean? Was there a difference in the water collected for drinking? What about water for bathing and cleaning? Let us investigate...

One of the ways that naturally cleans water is when it is filtered through the landscape. When water soaks into the land, minerals are added. The clean, mineral infused water provides our communities with clean drinking water and sustains our way of life. These minerals also help to keep our fish and animals healthy.

In the lesson, we will follow the path of clean water to our communities and into the ocean. We will see how water flows and is naturally filtered through the landscapes. We will also discuss traditional ways our ancestors got fresh water and how they packed it before our houses had running water.

Activities:

Class I:

- Opening Discussion: How does “Our Water” naturally get filtered through watersheds.
- Show an example of a typical Chugach Region watershed, together as class look for places where water can be filtered and discover why.
- Today, we will be making a natural water filter.
- Preparation for water filter experiment: <http://www.earthday.org/wp-content/uploads/5-8-Lesson-Plan1.pdf> (This can be done in advance or during class depending on time.)
 - Distribute pre-cut two litter bottles or recycled pre-cut water bottles
 - Install the coffee filter on the small bottle end and secure with a rubber band
 - Layer the materials for filtering (sand, pebbles, gravel) in bottle.
 - Place this bottle end in the remaining bottle bottom.
 - Pour clean water through the filter to rinse, and dispose of water.
- Make your Pollutant solution.
 - 1) First pollutant -First mix water and dirt (one cups of water and half cup of dirt and leaves or grasses). Mix this solution, and then using the mixing cups, pour solution back and forth 10 times to aerate the solution. This simulates the mixture moving down a creek.
 - 2) Second pollutant- Mix water, glitter (one cup water, one tablespoon of glitter). Use same method to aerate the solution.
 - 3) Third pollutant- Mix water, oil food dye and aerate the solution
- Experiment #1:
 - Slowly pour the first pollutant mixture over your water filter. Watch the water sift down through the materials. Wait 5 minutes as all the water filters through.
 - Ask the students what did they observe? Did the water come out cleaner?
- Experiment #2:
 - Slowly pour the second pollutant mixture over your water filter. Watch the water sift down through the materials. Wait 5 minutes as all the water filters through.
 - Ask the students what did they observe? Did the water come out cleaner?
- Experiment #3
 - Slowly pour the third pollutant mixture over your water filter. Watch the water sift down through the materials. Wait 5 minutes as all the water filters through.
 - Ask the students what did they observe? Did the water come out cleaner?

Class II:

- Discuss the various places and ways that water was collected a long time ago.
- Ask the students:
 - Where do you think that water was traditionally collected in your community?
 - How do you think they collected the water?
 - Do you know of any traditional springs?
 - Optional: Have the students to go home and ask parent, grandparents, family about stories they could share before having running water.

- Our region did not always have indoor plumbing.
 - How do you think that water was transported?
 - What types of containers or vessels were used to carry water?
 - When you visit a spring what do you carry water in?
 - Show the three examples of traditional devices used for carrying and hauling water.
- We are going to make a paper replica of Bentwood Boxes (lesson plans below and the PDF is attached to 'Our Water' website).

Assessment:

- Student can describe one vessel for hauling water modern and traditional.
- Student successfully completes one water filter experiment and correctly answers questions.

EXAMPLES OF TRADITIONAL DEVICES USED TO HAUL WATER

- **Bent Wood Box**



Smithsonian/Arctic Studies Collection

- **Grass or Spruce Root Baskets**



Pratt Museum Collection

- **Yoke or Stick Carrier and Toboggan**



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(*) Hauling water in the winter at Port Graham in the 1960s (Left to right: Dennis Anahonak and Pat Meganack)
Photo courtesy of Luba Meganack - Alexandrovsk vol.2 Page 61

BENTWOOD BOX MATH

<http://amathjourney.blogspot.com/2014/03/bentwood-boxes.html>

As I continue on this journey of incorporating FNMI content into my grade 3 math classroom, I find I do a lot of searching and locating information regarding various FN groups in Canada. Along with my research, I try to find connections between what I am learning and the outcomes my students need to achieve in math.

As we finish up our 3-D object unit, I wanted to find a FNMI lesson that would be beneficial to my students. To my excitement, I found out about **Bentwood Boxes** which connected nicely.

Bentwood boxes were cedar boxes made by West Coast FN (ie. such as, but not limited to, Haida and Salish). They were used for various purposes such as storing food and clothing, as well as ceremonial items. These boxes were used both in the home and on trips. More information about Bentwood boxes can be found at

Canadian Museum of History

Working Effectively With Aboriginal Peoples.com

Aboriginal Mathematics K-12 Network

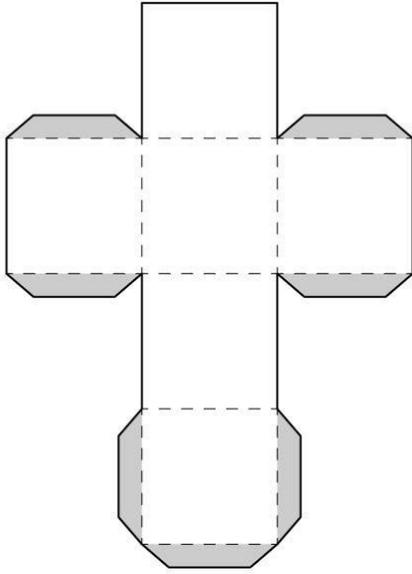
To begin the lesson, I showed students various images of Bentwood boxes and asked them what 3-D object they resembled. The students quickly showed their knowledge by connecting these to cubes and rectangular prisms.

We then discussed what these boxes are, where they originate from and I showed them a map of the West Coast of Canada so they could understand the location. Geography plays a great understanding in the different FNMI groups in Canada. Next we brainstormed different uses for these boxes and students elicited wonderful ideas that matched the information I had found, along with many more.

One of the neat things about Bentwood boxes is that the sides are made from one plank of cedar wood. This was cool as we discussed how the wood was bent after it is steamed, not cut and adhered in a manner we're more accustomed to thinking about. The students also made connections to other materials used to create structures (science unit) that are able to bend.

I was able to show the students an example of the steps used to create a Bentwood box (see above links) and a quick video via youtube highlighting the steaming and bending process: Making Bentwood Boxes

As we proceeded in the lesson, I then showed the students a net of a cube and some were quickly able to tell me it was a cube.



However, I told them that I did not understand how this was a cube since it was flat (at which point I grabbed a cube and held it to the SmartBoard to show that they were very different). Using a cube solid (manipulative) students then proved to me how the net and the cube were the same. Some of their responses / proofs were:

- 1) the flat squares on the net were the faces of the cube
- 2) the lines were the edges - and even the ones not touching a face (since an edge is where two faces meet), when we fold the net the edges will meet faces
- 3) the net needs to be folded to also create vertices

At this point I was completely thrilled at the connections and proofs my students were making. They were readily using math language and using definitions of terms to show their meaning. So, when I told them they were making their own version of a Bentwood box (ie. cube) the class response was "Yay!".

Just prior to beginning we noted the carvings on the boxes and discussed how these were special and important to each FN group. The carvings were representative of their group, culture and things that were important to them. Therefore, the students needed to draw images (one per face) on their cube net / bentwood box that were important to them.

