

TRADITIONAL TRANSPORTATION: BUILDING A MODEL QAYAQ GR: 6-12 (LESSONS 1&2)

Elder Quote/Belief: *“A bidarka is a long boat with three cockpits in it. Hunters, who travel in it, keel down to paddle, and have blankets rolled up for a cushion.”*

-Wally Braizaloff, Chenega Diariesⁱ

Grade Level: 6-12

Overview: The Chugach qayaq was developed over thousands of years of innovation. Each qayaq was hand carved, and lashed together with sinew or baleen. The development of the bifurcated bow allowed the qayaq to cut through ocean waves and deflect water away from the paddler. With each wave the qayaq was designed to flex with the wave, moving through the water with ease.

Standards:

<i>AK Cultural:</i>	<i>AK Content Science:</i>	<i>CRCC:</i>
E4: Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them. A student should determine how ideas and concepts from one knowledge system relate to those derived from another knowledge system.	B2: A student should understand and be able to apply the concepts, models, theories, universal principles, and facts that explain the physical world.	MC1: Different kinds of wood have different qualities and different uses; wood can be obtained from the forest and from driftwood.

Lesson Goal: Students will build a model of a qayaq from the Chugach Region.

Lesson Objective(s): Students will:

- Learn about the purposeful design and characteristics of the qayaq.
- Build a model of a traditional Sugpiaq/Chugach qayaq.

Vocabulary Words: Sugt'stun Dialects

English:	Prince William Sound:	Lower Cook Inlet:	<u>Eyak:</u>
Kayak	Qayaq	Qayaq	<u>gAyAXgug</u>
Keel	Nanguna		
Bow	nucuguia	cuunga	<u>qu'LXaad</u>
Stringers	unarat	nugluku	
Ribs	atuna	rraatan	

Materials/Resources Needed:

- If possible, invite an Elder or Recognized Expert from the Region to share their traditional ecological knowledge (TEK) and expertise to enrich the lesson(s).
- Mitch Poling's Model Qayaq lesson (attached below)
- *Chenega as I saw it - its people*. Anchorage, AK: Chugach Alaska Corporation. Junction, AK: Voice of Alaska Press.
- Golden, H. (2015). *Kayaks of Alaska*. Portland, OR: White House Grocery Press. (in kit)
- PowerPoint presentation: The Story of Chenega by Mitch Poling
 - PowerPoint located on the [Traditional Transportation resources page](#).
- Video: The Last Baidarka of Prince William Sound by Andrew Elizage (25:44 minutes)
 - <https://vimeo.com/79394382>

Supplies needed:

- Basswood for sternpost and stringers from National Balsa Wood Company;
 - <http://www.nationalbalsa.com/>
- Reed for ribs and cockpits (VI Reed Company)
- Nylon stockings for qayaq cover
- Hot glue gun
- Hot glue sticks
- Small spring clamps.
- Utility knives for cutting Basswood
- Pre-Cut Bifurcated Bow and Stern

Teacher Preparation:

In preparation for class collect the included materials and resources from the kit included in the Materials and Resources list. Students will be building traditional qayaq models. This activity will take multiple days to complete.

- Invite an Elder or Recognized Expert that could share their expertise on the lesson content.
- Before the Elder or Recognized Expert arrives, please review with the students, ways to show respect for the Elder during their visit.
- Gather and prepare individual kits to include all necessary parts and pieces. (Could also contact Chugachmiut Heritage Preservation Department to see what supplies are available to use.)
- Create small working groups to share ideas and tools.
- Make copies of *Chenega: As I Saw it- It's people* by Bobby Stamp; regarding the Baidarka, pages 19-21
- Make copies of Mitch Poling's Model Qayaq building directions (attached below).

Opening:

The Chugach qayaq was built from local wood, female sea lion skins, sinew and specially designed bifurcated bow. This hand carved two part bow is extremely efficient by cutting through waves, adds buoyancy and disperses the wave from cresting on to the paddler. This design was developed hundreds if not thousands of years ago, allowing the people of the Chugach Region to travel safely through the rugged and powerful oceans of region

Activities:

Class I:

1. Introduce the lesson by reading a selection from; *Chenega: As I Saw it- It's people* by Bobby A. Stamp; Baidarka pages 19-21
2. Watch "[The Last Baidarka of Prince William Sound](#)" located on the Chugachmiut Heritage Traditional Transportation Website.
3. Students write and describe ten facts about qayaqs and qayaq building from the selected reading and video. Students to focus specifically on qayaq design, materials, bow and gender of sea lion used for the skin covering.
4. Review classroom and tool safety procedures, hand out included form for parent signature.

Class II:

1. Turn in signed Carving and Woodworking Safety checklist.
2. Hand out materials to each student to organize.
3. Review directions below from the lesson provided by Master Baidarka Boat Builder, Mitch Poling.

Assessment:

- Students can describe the use of the bifurcated bow, wood design and covering and why it was so efficient and important to the design of the qayaq.
- Student follows directions and successfully completes the model of a traditional qayaq.

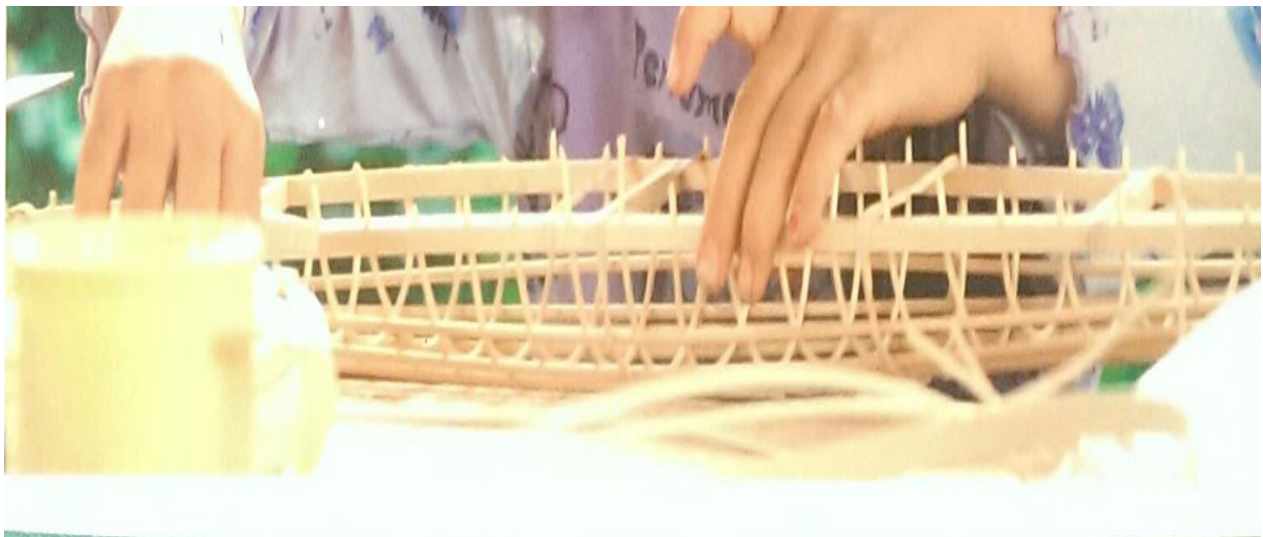
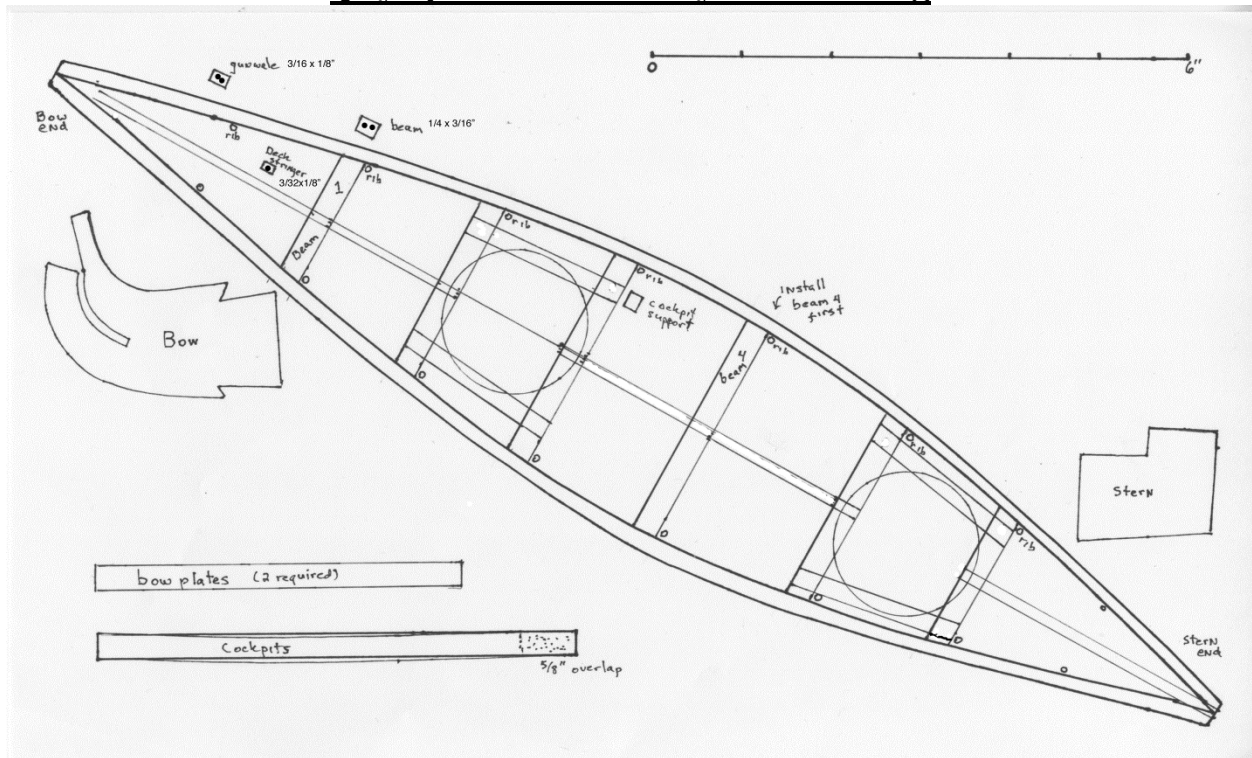


Photo Credit: Chugach Alaska Corporation: Nuchek Spirit Camp, John Johnson

¹ *Chenega Diaries: Stories and Voices of Our Past*, Pg. 244

Qayaq Model Lesson by Mitch Poling



The Qayaq model will take approximately five class periods of fifty minutes with assistance. This activity will include measuring, cutting wood with utility knives, hot glue and use of small clamps.

Materials:

- Hot glue gun and hot glue
- Small wood spring clamps
- Wood Glue
- Nylon Stockings for frame cover
- Rubber bands

Wood Materials:

- Basswood strips (from National Balsa)
 - Gunwales: 3/16 X 1/8 X 36"
 - Beams: 3/16 X 1/4
 - All Stringer 3/32 x 1/8 X 36"
- Basswood flat stock (from National Balsa)
 - 3/16 X 3" X 24" for Bow and Stern
- Flat Reed (from Basketweaving.com)
 - 3/16" for bow plates, cockpits, and ribs.

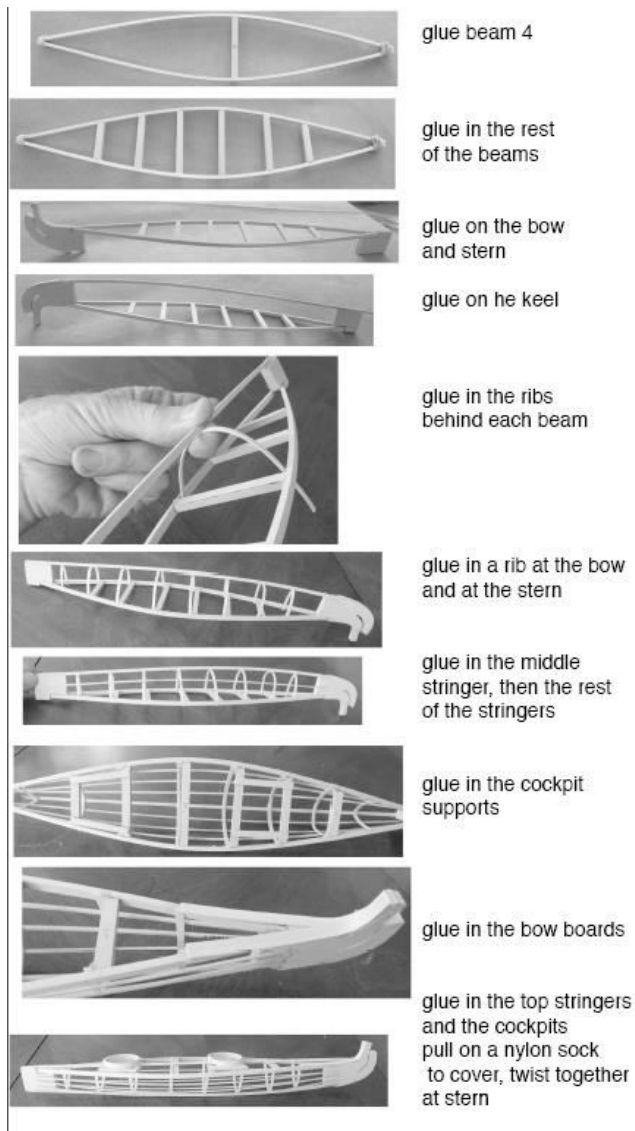
Each kit will need to have the bow and stern pieces precut with a band saw using the included template.

MODEL PAGE 1

Sizes of wood pieces:

- Gunwales #1 & #2: 15 inches
- Center Keel: 15 inches (cut to size)
- Beams: #1- 1.5 #2-2 #3-2.5 #4-2.5 #5-2 #6-1.5
- Cockpit Supports: 2" (cut to size)
- Ribs: Measure to fit: will need 8 total
- Cockpit: 5 5/8 inch
- Bow Plates: 4 inch
- Deck Stringers: 5 inch, 4 inch, 3 inch

Follow the included direction sheet provided by master boat builder Mitch Poling.



MODEL PAGE 2

Carving, Wood Working Safety Checklist

1. Judgement
 - Knives and other carving tools are not toys.
 - Carve only under the direction of a teacher or adult supervision.
 - Carve only when you can focus on your work. Avoid distractions
 - Never bring a knife to school for carving.
 - Horseplay is not allowed near or around carving and knives.
2. Caring for your tool.
 - Keep tools and knives sharp and clean
 - Wear protective safety gear, such as: carving gloves, safety glasses and mask.
 - Store tools in a safe place and never bring tools home.
3. Work Environment
 - Use a clamp, and carving board for better control when carving small or shaped objects.
 - Use a clamp to hold down wood while using a coping saw.
 - Use a bench, sturdy chair and appropriate lighting.
4. Handling Knives
 - Never pass a knife across to other people at the table.
 - Never carve in your lap or near your face or wrists.
 - Take small carving strokes for more control.
 - Never “muscle” a project when carving.
 - Always make sure your knife is sharp. Dull knives are challenging and dangerous to carve with.
 - Never pound or “hammer” your carving knife to make a cut.
5. Choices
 - Choose the correct wood for a project.
 - Lay out your project and have plenty of space around you while cutting them out.

Student Signature_____ **Date**_____

TRADITIONAL TRANSPORTATION: QAYAQ MEASUREMENTS GR: 6-12 (LESSON 3)

Elder Quote Belief:



“People took a year or two to gather stuff for their qayaq (kayak). They were always looking ahead to find the certain pieces of driftwood. They had time.”
-Nick Tanape Sr., Nanwalek¹

Grade Level: 9-12

Overview: The Sugpiaq of the Chugach Region made qayaq/kayaks to fit each hunter. Each part of the wooden qayaq frame was measured according to their body size then the materials were cut/ carved accordingly and the frame was assembled together with lashings. The qayaq was traditionally covered with sea lion skins that were waterproof stitched together with sinew.

Standards:

<i>AK Cultural:</i>	<i>AK Content:</i>	<i>CRCC:</i>
B (2) Culturally-knowledgeable students are able to build on the knowledge and skills of the local cultural community as a foundation from which to achieve personal and academic success throughout life.	E (3) Science and Technology: A student should understand the relationships among science, technology and society.	S (6) Students should know how to make tools from natural resources in the outdoor environment.

Lesson Goal: Learn how to use basic body measurement techniques and find the dimensions of a qayaq for an individual person.

Lesson Objective(s): Students will:

- Learn and share notes on the traditional technique to measure for individual qayaq from the enclosed articles and books.
- Follow a series of directions to measure their body, and document the results for a personalized qayaq.

Vocabulary Words: Sugt'stun Dialects

English	PWS	Lower Cook Inlet	Eyak
Kayak	qayaq	qayaq	gAyAXgug
Bow	Nanguna	Nucuguia	qu' LXaad
Stern	nucuguia	Aqua/ kingua	
Ribs	unarat	atuna	
Keel	atuna	Nanguna	

Materials/Resources Needed:

- If possible, invite an Elder or Recognized Expert from the Region to share their traditional ecological knowledge (TEK) and expertise to enrich the lesson(s).
- [Chugach Eskimo](#) pg. 45-49
- *Qayaqs and Canoes; Native Ways of Knowing* by Jan Steinbright
- The Hunter and the Hunted; Alutiiq Seal Hunter and Harbor Seal by Pratt Museum
- Tape Measures (classroom set)
- Qayaq (Kayak) measurement form (attached)

Teacher Preparation:

- Contact your Local Education Coordinator for a list of Elders that could share their expertise on the lesson content.
- Before the Elder or Recognized Expert arrives, please review with all of the students, ways to show respect for the Elder during their visit.
- Prepare copies of [Chugach Eskimo](#) pages 45-49 for each student.
- Make copies of Qayaq (Kayak) Measurement Form for each student.
- Connect video resource to classroom smart board or projector.
- Split class in the small working groups.

Opening: The qayaq has played a vital role in the cultural history of the Sugpiaq in the Chugach region. Each hunter was equipped with a personally measured qayaq made exclusively for their body. Qayaqs were made in the kneeling and sit down body position. In this lesson you will measure yourself sitting in a qayaq using instructions by Nick Tanape from Nanwalek, Alaska.

Activities:**Class I:**

1. Introduce Elders/Recognized expert to class to share TEK on qayaqs and traditional measurements. Allow time for questions.
2. Divide students into small groups, assisted by the teacher.
3. Have students read *Chugach Eskimo*, pages 45-51 and *The Hunter and the Hunted* individually or in assigned small groups. If in groups, assign one student from each group to take notes on key points of the article.
4. After the small groups finished, ask them to share their notes and 10 facts from the articles.
5. Hand out a tape measure and Qayaq (kayak) Measuring Form to each group.
6. Following the directions students will measure their bodies and record the findings on the form. Each group member will assist with measuring and documenting.

7. Students will work as a team to record accurate measurements of their body and complete the Qayaq Measurement Form with their results.

Assessment:

- Student groups documented ten or more notes from the readings and shared findings.
- Each student recorded their qayaq body measurements on the Qayaq Measurement Form.
- Students can describe the traditional techniques for measuring a qayaq for a personalized qayaq according to their worksheets and notes.

¹ Qayaqs and Canoes; Native Ways of Knowing by Jan Steinbright; pages 101-119

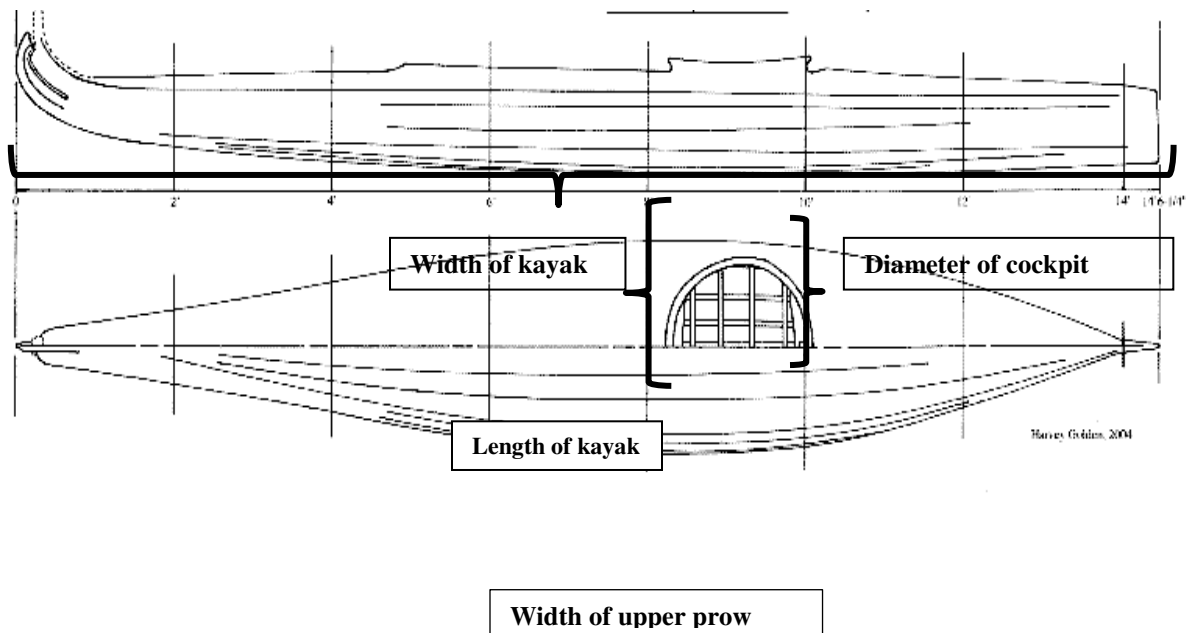
Qayaq (kayak) Measurement Form

Measurement Directions:

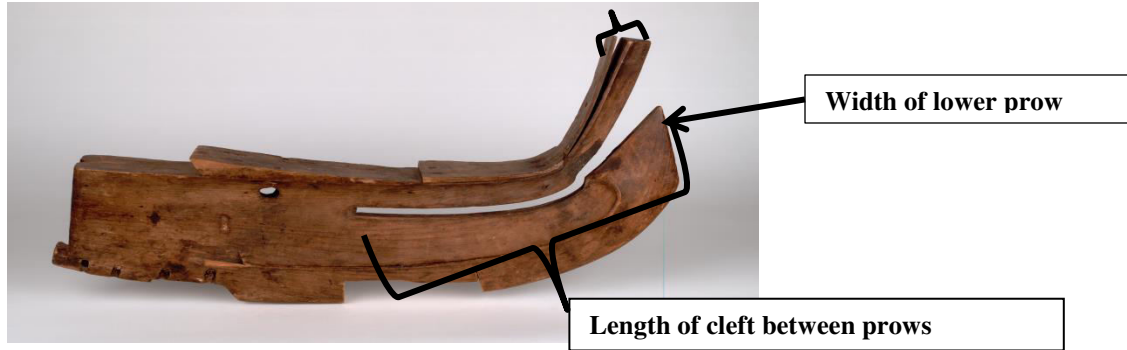
1. Arms Outstretched- 3.5 times for Qayaq (kayak) length. _____
2. Fists on Hips- Qayaq width. _____
3. Diameter of cockpit; Lower arm plus hand length. _____
4. Small of back to balls of feet- deck beam length to foot brace. _____
5. Small of back to knees- where knees rest on forward deck beam of cockpit. _____

Measuring the Bifurcated bow:

1. Width of Lower Prow; three finger widths _____
2. Width of upper prow; four finger widths _____
3. Length of cleft between prows; two hand widths with outstretched thumbs plus to thumbs. _____



Bifurcated Bow



*Actual Seal Skin Covered Bifurcated Bow from Traditional Qayaq located in Cordova Historical Museum
Photo courtesy of Nick Jordan*

TRADITIONAL TRANSPORTATION: FINDING THE WAY; LAND TRAVEL GR: 6-12 (LESSON 4&5)

Elder Quote/Belief:



"I used to hear these little stories, we do this masking in January and people would actually walk that same evening and go dance here to Port Graham and back then to Port Lock...that's a long stretch and just to dance, wow those guys were full of energy to walk that far."

-Wally Kvasnikoff, Nanwalek
(Interview on 11/15/2016)

Grade Level: 6-12

Overview: The Sugpiaq traveled by land and water to trade, hunt, and fish. Land trails through the region connected villages, hunting sites, and allowed the Sugpiaq to portage their qayaqs due to bad weather or to take an overland route to another body of water.

Standards:

<i>AK Cultural:</i>	<i>AK Content Science:</i>	<i>CRCC:</i>
D (1) Culturally-knowledgeable students are able to engage effectively in learning activities that are based on traditional ways of knowing and learning.	F (3) Cultural, Social, Personal Perspectives and Science: A student should understand the dynamic relationships among scientific, cultural, social and personal perspectives.	G (2) Students should be able to read local, regional and navigational maps.

Lesson Goal: Learn about land travel throughout the Chugach Region.

Lesson Objective(s): Students will:

- Learn methods used by the Sugpiaq to mark a trail.
- Create trail markers from various materials for a local trail.
- Develop a map on of local trails with Elder knowledge on Simtable if available, if not use google maps.

Vocabulary Words:

Sugt'stun Dialects			
English:	Prince William Sound:	Lower Cook Inlet:	Eyak:
Tree	nuguwaggtuq	napaq	lis
Trail Blazing (?)		nallunaiggkutaq	
Hike	ang'asik	ang'asik	

Materials/Resources Needed:

- If possible, invite an Elder or Recognized Expert from the Region to share their traditional ecological knowledge (TEK) and expertise to enrich the lesson(s).
- Chugach Region Map/ Area maps
- [Alexandrovsk](#) No. 2 pg. 54; Trails
- Article: BLM Marking lines for corners (Attached to lesson)
- Trail Marking Materials (rocks, paints, tin can lids, wood stakes)

Optional materials/equipment to enhance lessons:

- Simtable (Located at Chugachmiut Cultural Heritage Department, available to borrow)
- GPS devices
- Avenza application (Download onto smart devices) and PDF map of area

Teacher Preparation:

- Invite an Elder or Recognized Expert that could share their expertise on the lesson content.
- Before the Elder or Recognized Expert arrives, please review with all of the students, ways to show respect for the Elder during their visit.
- Work with the local Tribe, school, State Park, National Park or Forest Service to develop appropriate signs for use on a local trail.
- Make copies of the article *Trails* from Alexandrovsk No. 2 , page 54
- Make Copies of BLM Marking lines for corners (Attached).

Optional:

- Decide if want the Simtable to enhance lesson- if so- request in advance
- Locate GPS devices to use
- Download the Avenza app and PDF map files of area

Opening:

The coast line of the Chugach Region is dynamic, and challenging in all weather conditions. The Sugpiaq used to travel by water via the qayaq, anyaq, and dugout canoe. When bad weather stopped water based travel the Sugpiaq used established trails to travel through the challenging terrain. These were not any marked or maintained trails as the trails were used by both people and animals.

Trail markers known as “trail blazing”, or *cultural modified* trees (CMT) were used through the region. The Sugpiaq would create their own trail markers to help guide their way home or to their next destination. The regional trails were limited by glaciers and challenging terrain. Traditionally the Sugpiaq would modify trees on a pathway using a stone adz. This marking (modification) would be located at eye level and alternate between the sides of a trail to keep the traveler on the path. The trees are referred to as *line trees* or *sight trees* used for navigation along a path. The Sugpiaq used these blazed trails to travel from villages, hunting/fishing sites and to celebrations.

In these lessons, we will use prior knowledge learned in previous land travel lessons regarding making trails and incorporate technology to locate trails, look at the terrain, interview Elders and make a project about traditional trails.

Activities:

Class I:

1. Introduce the Elder to share their knowledge on traditional trails that were used in the area.
2. Allow time for questions.
3. Have map available for the Elder to point out the location of traditional trails.
4. Ask the students to read article “Trails” from [Alexandrovsk](#) No. 2, pg. 54
5. Have a discussion if they know of anyone else in the community who may know of traditional trails that were used.
6. Assign a project for students to interview Elders/Recognized Experts regarding traditional trails. Look at the Interview Prompt located on the webpage for an example and revise as needed. Questions such as:
 - a. Does your community have trails for different uses?
 - b. What types of trail does your community have access?
 - c. Trails for resources? (berries, hunting, trapping, gathering, fishing)
 - d. Trails for traveling to villages or shelter?
 - e. Any other trails that were not mentioned?
7. Map the locations on google maps. The map can be displayed on smart board or individual computers. As a group, closely examine the topography, elevation, distance and obstacles.
8. Remind students to use this map as they interview the Elder/Recognized Expert.
9. Allow time for students to finish their interviews.

Class II:

1. As a group, have a map available to point out the location of trails as students share their interviews.
2. Have the students edit their interviews with inserts of maps that were marked with the trail.
3. Have the class compile the interviews into a video to share.
4. As a group, use the Simtable (set this up prior to class) to closely examine the various trails Elders who were interviewed discussed.
 - a. Emphasize the terrain along the trails.
5. As the students are working through the trail locations on maps and Simtable, inform them that we will be going on a field trip using technology like GPS (or Avenza) to locate the trails and look for any trail markers.
6. Hand out parent permission slips to each student for a field trip to locate the trails. Give a couple days to get these forms all returned.

Class II:

1. Before the field trip, have a discussion on different trail-marking, specifically culturally modified trees (CMT).
 - a. What are CMTs? Blazing. Traditionally, a stone adz was used to mark trees along a trail. Show pictures of blazing. Stress the importance that we will not be doing blazing in this class.
 - b. What about other types of trail markers? Emphasize trail markers made from natural or recycled materials for a local or personal trail.
 - i. Interpretive Sign with researched information
 - ii. Painted Rocks
 - iii. Plastic bottle caps nailed to trees to follow

- iv. Painted soup can lids attached to paint sticks or wood stakes
 - v. Flagging tape
 - vi. Rock stacking
2. Hand out and review the worksheet the students will have to answer upon return from field trip.
3. Teach how to use the GPS devices (or Avenza app downloaded onto their smart devices to use.) PDF maps are available for downloading off of the Traditional Place Names webpage.
4. Encourage the students to take photos along the trails.
5. While on hike, have the students look for markers.
6. Ask the students:
 - a. Do you see any markers?
 - b. What types of trail markers are being used?
 - c. Do the markers make sense?
 - d. Who marked the trails?
7. Name/ describe 3 additional ways trails can be marked.
8. As they described the marked trails, ask following questions:
 - a. Are these trails for humans or for humans and animals?
 - b. Why would an animal use a human developed trail.
 - c. Do you see any signs of a culturally modified tree (CMT)?
 - d. Traditional modifications or modern modification?
9. Upon return at the classroom, share their photos, answers and discuss.

Assessment:

- Students successfully made an Elder Interview video project on traditional trails used around community.
- Student successfully mapped out local traditional trails and trail locations from the article *Trails*, Elder interviews, through the use of SimTable, google maps.
- Student successfully located trails with GPS or Avenza, answered all worksheet questions and provided documentation of their observations of any culturally modified trees, trail markers on hike.



A culture bearer from the Eyak Culture camp examining a culturally modified tree found in the forest.

Scarred trees were sources for essentials for life such as food, planks, and clothing.

Photo courtesy of Heather Hall, USFS



Tree Carving, Juneau Alaska on Mt. Roberts, Eagle

Resource from <https://www.blm.gov/cadastral/Manual/73man/id161.htm>
A blaze is a smoothed surface cut upon a tree trunk at about breast height.

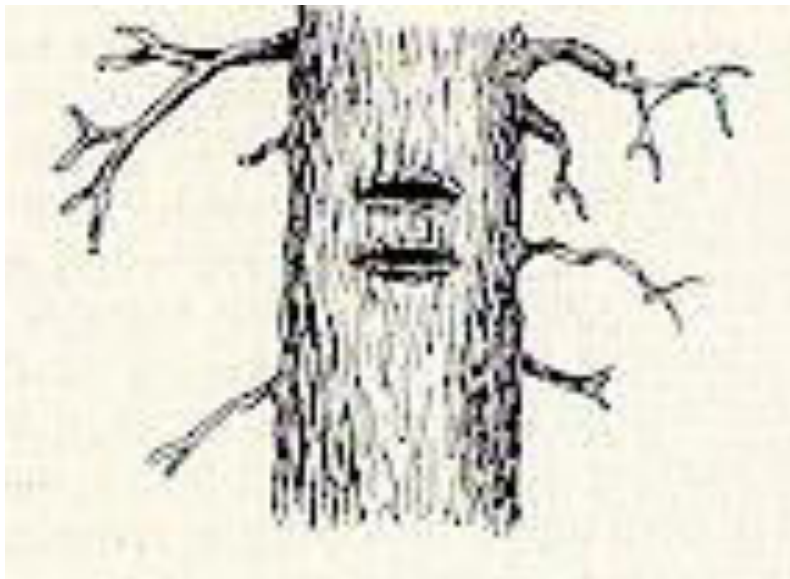


Figure 61. - Hack marks on a line tree.

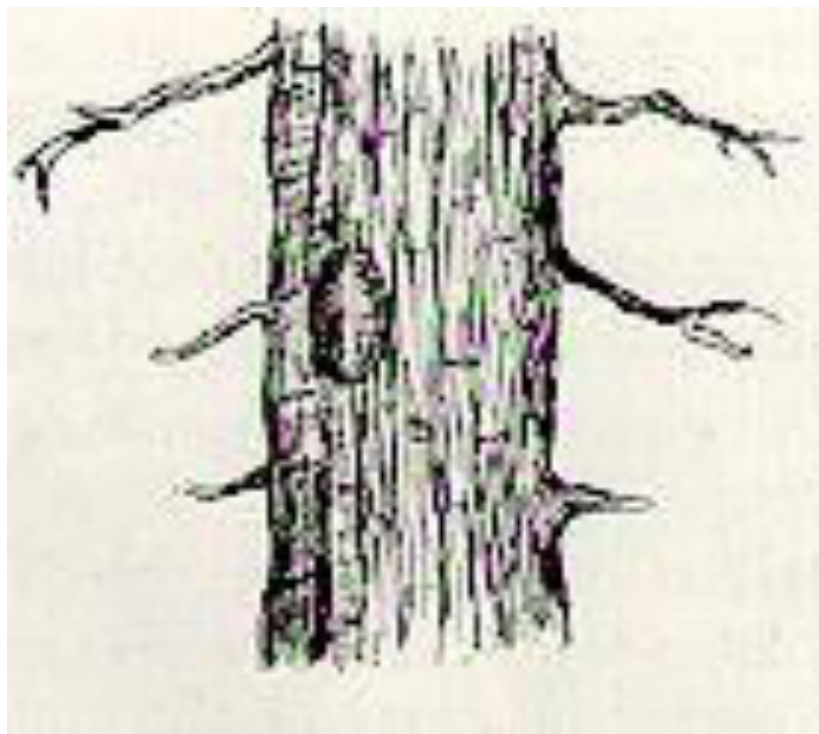


Figure 62. - A line blaze.

The bark and a small amount of the live wood tissue are removed with an axe or other cutting tool, leaving a flat surface which forever brands the tree. The size of the blaze depends somewhat upon the size of the tree, but should not be made larger than the surface of the axe blade. A blaze five or six inches in height and from two to four inches in width is usually ample.

A hack is a horizontal notch cut well into the wood, also made at about breast height. Two hacks are cut to distinguish them from other, accidental marks. A vertical section of the finished hack marks resembles a double-V extending across a tree from two to six inches depending upon the diameter of the tree.

The blaze and hack mark are equally permanent, but so different in character that one mark should never be mistaken for the other. The difference becomes important when the line is retraced in later years.

Trees intersected by the line have two hacks or notches cut on each of the sides facing the line, without any other marks whatever. These are called sight trees or line trees. A sufficient number of other trees standing within 50 links of the line, on either side of it, are blazed on two sides quartering toward the line, in order to render the line conspicuous and readily to be traced in either direction. The blazes are made opposite each other coinciding in direction with the line where the trees stand very near it and approaching nearer each other toward the line the farther the line passes from the blazed trees. Figure 63.

The lines should be so well marked as to be readily followed and the blazes plain enough to leave recognizable scars as long as the trees stand. This can be accomplished by blazing just through the bark into the live wood tissue. The blazes should be narrow so that they will heal before decay begins, and special care should be taken not to loosen the cambium layer around the blaze, since this will prevent overgrowth. Where trees have branches growing to the ground, the blazes may be omitted unless it is necessary to remove the branches to permit sighting.



Figure 63. - Marking a line through timber.

Lines are also marked by cutting away enough of the undergrowth to facilitate correct sighting of instruments. Where lines cross deep wooded valleys, by sighting over the tops, the usual blazing of trees in the low ground when accessible will be performed. The undergrowth will be especially well cut along all lines within distances of 5 chains of corner monuments and within 2 chains of arteries of travel, but the cutting of the undergrowth may be omitted in deep untraveled ravines unless necessary for accurate sighting or measurement.

Line trees and blazing are marked only with reference to the established true line. Where lines are run by the "random and true" line method, the marking of line trees and the blazing is accomplished by returning over the line after all corrections or adjustments to the final line are definitely known. A sufficient number of temporary stakes should be set along a random line to render it generally unnecessary to rerun the true line instrumentally merely for the purpose of blazing the line through timber. This can usually be accomplished by properly estimating the distance from the temporary stakes, but intersections with line trees will be made with precision, and distances thereto accurately measured.

Journal Questions about Local Hiking Trails

1. What types of trail markers are being used?
 - a. Do the markers make sense and why?
2. Who marked the trails?
3. Describe three additional ways trails can be marked.
 - a.
 - b.
 - c.
4. Are these trails for humans use or animals?
5. Why would an animal use a human developed trail?
6. Did you see any signs of a culturally modified tree (CMT)? Traditional modifications or modern modifications?
7. Describe a local feature (tree, mountain, rock) you could use as a reference point if you happen to get lost while hiking.
8. Why is trail blazing not encouraged for marking trails?

Photo of Stone Adze from the Chugach Region



In this photo the stone adze is shaped with a point for digging, and wood splitting. A wooded handle would be attached to the back and wrapped through the notches on the adze.

TRADITIONAL TRANSPORTATION: SUGPIAQ PADDLES GR: 6-12 (LESSON 6&7)



Sugpiak Paddles located in the Cordova Historical Museum. Photo courtesy of Nick Jordan

Elder Quote/Belief:

A one handed paddle was generally used. It had a spear-shaped blade and a crutch handle at the end of the shaft... The paddler was kneeling and took two or three strokes on one side, then two or three on the other.ⁱ

Grade Level: 6-12

Overview: The Sugpiak paddle is a prized personal possession. Most paddles were hand carved out of found driftwood. Each paddle was painted and adorned with traditional designs and hunting scenes. Paddles were built specifically for the owner based on their height and hand size. The single blade paddle was designed for efficiency and for sound reduction while hunting.

Standards:

<i>AK Cultural:</i>	<i>AK Content Science:</i>	<i>CRCC:</i>
D5: Culturally-knowledgeable students are able to engage effectively in learning activities that are based on traditional ways of knowing and learning.	F1: A Student should understand the dynamic relationships among scientific, cultural, social and personal perspectives.	S7: Students should know how to make tools from natural resources in the outdoor environment.

Lesson Goal: Learn how paddles were measured and carved for each individual owner. In this class, the students will carve a full length paddle from one inch width red or yellow cedar board (or cardboard).

Lesson Objective(s): Students will:

- Learn about the parts of a paddle
- Learn how to measure a traditional Sugpiak paddle to fit their body
- Carve a Sugpiak paddle from cedar, spruce or materials available to classroom.

Vocabulary Words: Sugt'stun Dialects

English:	Prince William Sound:	Lower Cook Inlet:	Eyak:
Paddle		Paqun / Pakiutaq	kAwusgL
Driftwood		Tep'ak	dAkinh (wood)
Spruce		Napak	Lis, AdAlis
Handle		Pakiutem Ikua	
Blade		Uklucinampia	

Materials/Resources Needed:

- When possible, invite an Elder or Recognized Expert from the Region to share their traditional ecological knowledge (TEK) and expertise to enrich the lesson(s).
- 'My Sugpiaq Paddle Dimensions' worksheet
- Classroom set of acrylic paint and paint brushes
- Ten- 15foot tape measures
- Book: [The Chugach Eskimo](#) pg. 45-51 (for images of paddles)
- Video: Sven Haakanson www.vimeo.com/184085247 (Minutes 16-18:15)

If doing cardboard paddles:

- Gather long pieces of cardboard (1'x 6') for each student.
- Yard sticks
- X-Acto knives

If carving paddles:

- Carving wood: 1' x 6' cedar, spruce or available wood.
- One quart Tung Oil (non-toxic)
- Classroom set of carving tools:
 - Draw knife 8"
 - Small block plane
 - Rasp
 - Angle gauge
 - Clamps
 - Carving boards
- Sandpaper (60,120, 220 Grit)
- Carving Gloves
- Safety glasses

Teacher Preparation:

- Invite an Elder or Recognized Expert to class and share their expertise on the lesson content.
- Before the Elder or Recognized Expert arrives, please review with all of the students, ways to show respect for the Elder during their visit.
- Preview video with Sven Haakanson <https://vimeo.com/184085247>
- Prepare a chart to measure students for paddle height and blade width.
- Make copies of 'My Sugpiaq Paddle Dimensions' worksheet (attached)
- Make copies of *The Chugach Eskimo*, pg. 45-51
- Review school rules and prepare any necessary paperwork for classroom concerning the use of sharp objects / and carving knives.
 - Review attached carving safety guidelines, make revisions as needed.

Opening:

The Sugpiaq and Eyak of the Chugach region used single bladed paddles to navigate the qayaq/kayak, anyaq and dugout canoe. The paddles were carved from single pieces of driftwood. The length of the paddle is determined by: type of boat, paddler's height and hand width. These paddles look similar but vary in length. The qayaq/kayak paddle is the shortest of the three. The anyaq and dugout canoe paddles are similar in length. Each paddle was carved and painted with traditional designs. Today, you will measure yourself with a tape measure to see how tall a real paddle would be based on traditional measuring methods to make a full size replica of a Sugpiaq paddle. If time permits, make a paddle specific to your measurements.

Activities:

Class I:

1. Introduce the Elder/Recognized Expert to share the TEK. Allow time for questions.
2. Introduction to lesson and discussion on types of paddles
3. Ask students to read the article from [*Chugach Eskimo*, pgs. 45-51](#) and take notes on construction methods and purposeful design methods for travel and hunting.
4. Show the video from the Alutiiq Museum of Sven Haakanson describing the uses and styles of paddles for qayaq, and anyaq; <https://vimeo.com/184085247>
 - a. Select Minutes 16-18:15
5. Measuring student height and hand width.
 - a. Have students work in small groups to measure in inches and centimeter, record information on their handout.
 - i. **For paddle height:** students lay on floor with arms at sides. Using a tape measure, students in the group measure their height from the top of their head to their feet.
 - ii. **Blade width:** students will measure hand by holding out their hand flat. Students will measure from side of thumb to side of pinky.
 - iii. **Blade length:** with arms out stretched; measure from tip of fingers to center of chest.
 - iv. **Shaft length:** paddle height minus (-) blade length = shaft length.
 - b. Students will record measurements on 'My Sugpiaq Paddle Dimensions' worksheet (attached) for use during the next activity.

6. Using their measurements, ask the students to draw out their specific paddle size on the cardboard.
7. Encourage the students to double check their measurements BEFORE cutting out the paddle.
8. Review and emphasize the safety rules need to be strictly followed.
9. Hand out the X-Acto knives for students to carefully cut out the paddle.
10. When finished have students paint their paddles with traditional colors.
11. Take a class picture with completed paddles.
12. Display for school.

Class II: Five (45 minute sessions)

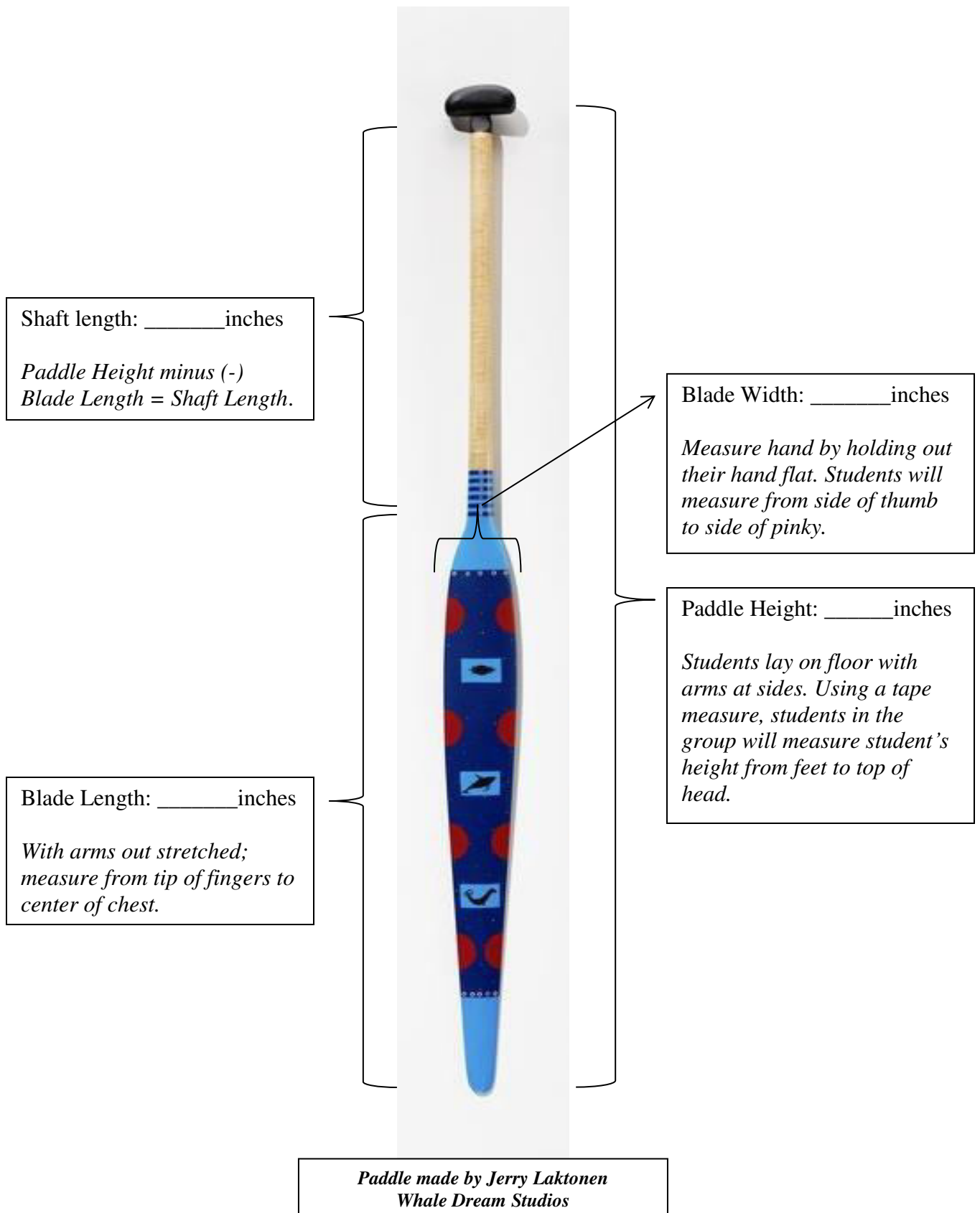
1. Prior to class, ask the students to bring permission slips home.
2. All parents will need to review and sign the permission slip, 'Carving, Wood Working Safety Checklist' and return to teacher before activity begins.
3. Give each student a 1'x 6' cedar board and develop a paddle template based on their paddle measurements.
4. As a class, review the permission slip and any school rules as pertains to carving and use of tools. These rules should be strictly followed. No horseplay.
 - a. **Additional carving directions and suggestions below.**
5. Students will share carving tools, and techniques at table stations.
6. Ask the students to research and paint paddles with traditional designs (see example below).
7. Use Tung oil to finish and complete.
8. Take a class picture with completed paddles.

Assessment:

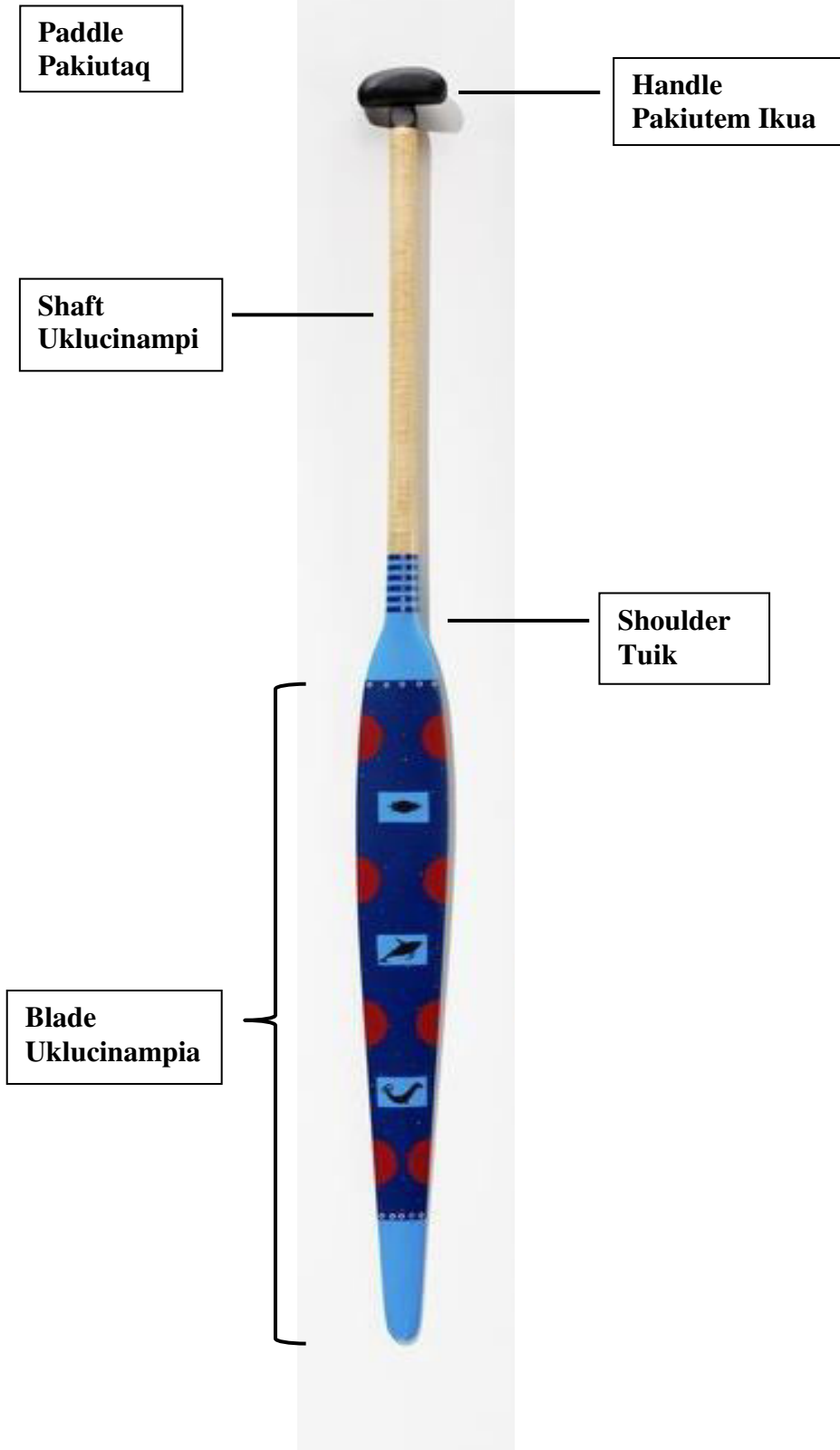
- Students are able to describe the parts of a paddle in Sugt'stun/Eyak.
- Students will understand and demonstrate how to traditionally measure the body for blade width, blade length and overall paddle construction as they successfully completes the 'My Sugpiaq Paddle Dimensions' worksheet.
- Students successfully carve a full length custom paddle to their dimensions with traditional paint color and designs.

¹ *The Chugach Eskimo: Communications by Kaj Birket-Smith pg. 48*

My Sugpiaq Paddle Dimensions



English and Sugt'stun vocabulary



Carving, Wood Working Safety Checklist

1. Judgement
 - Knives and other carving tools are not toys.
 - Carve only under the direction of a teacher or adult supervision.
 - Carve only when you can focus on your work. Avoid distractions
 - Never bring a knife to school for carving.
 - Horseplay is not allowed near or around carving and knives.
2. Caring for your tool.
 - Keep tools and knives sharp and clean
 - Wear protective safety gear, such as: carving gloves, safety glasses and mask.
 - Store tools in a safe place and never bring tools home.
3. Work Environment
 - Use a clamp, and carving board for better control when carving small or shaped objects.
 - Use a clamp to hold down wood while using a coping saw.
 - Use a bench, sturdy chair and appropriate lighting.
4. Handling Knives
 - Never pass a knife across to other people at the table.
 - Never carve in your lap or near your face or wrists.
 - Take small carving strokes for more control.
 - Never “muscle” a project when carving.
 - Always make sure your knife is sharp. Dull knives are challenging and dangerous to carve with.
 - Never pound or “hammer” your carving knife to make a cut.
5. Choices
 - Choose the correct wood for a project
 - Lay out your project and have plenty of space around you while cutting them out.

We have read, understand, agree and will abide to the safety rules in order to make Sugpiaq paddle.

Student Signature_____ Date_____

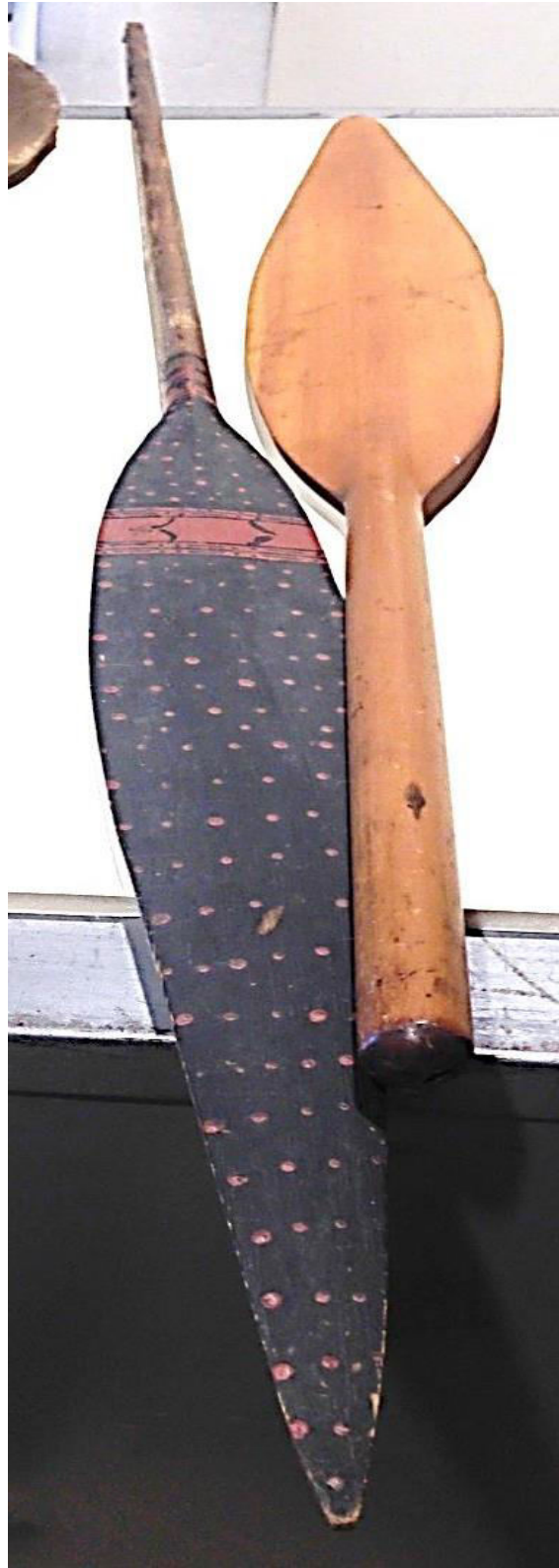
Parent Printed Name_____

Parent Signature_____ Date_____

Emergency Contact Information: (907) _____

Paddle Carving Directions and Suggestions:

1. Develop a template on butcher paper to help with drawing out the paddle design on the carving wood.
2. Before carving, create a straight centerline on the wood lengthwise. **This will be an important reference mark**, use a pencil line or chalk line.
3. Start removing wood with a draw knife that will not be a part of the paddle, use your reference lines, and paddle outline.
4. When you get within a quarter of an inch (1/4") slow down and switch to the hand planer.
5. Re-draw your reference lines if they have been removed during carving process.
Continue this process throughout the carving of the paddle.
6. Once the handle and shaft have been shaped, begin on the blade.
7. Start removing wood from the blade using the block plane, and drawknife. As you remove wood shavings keep measuring the center line and tip (1/4 inch) and taper down to the edges of the paddle blade (3/8 inch). This process will take a while.
8. Move back up to the handle and shaft. Using the rasp, begin to carve out the paddle handle to the desired shape and size.
9. At this point your paddle will still have many corners and will be angular. You can now start to shape the edges of the shaft, handle and blade. Use the draw knife lightly, rasp and heavy grit sand paper #80.
10. Start sanding. Start with heavy grit sandpaper (80 on hardwoods, 120 on softer woods) and sand until the rasp marks are gone. Switch to finer grits until you get to 180-200 grit. If you have a soft sanding block this can be useful to sand the contours of the shaft and blade, but it's not necessary.
11. Once finished with sanding smooth, add designs and finish with a clear poly urethane or Tung oil or a varnish of your choice, repeat process if necessary. Sand with fine grit #320 in-between coats if needed.

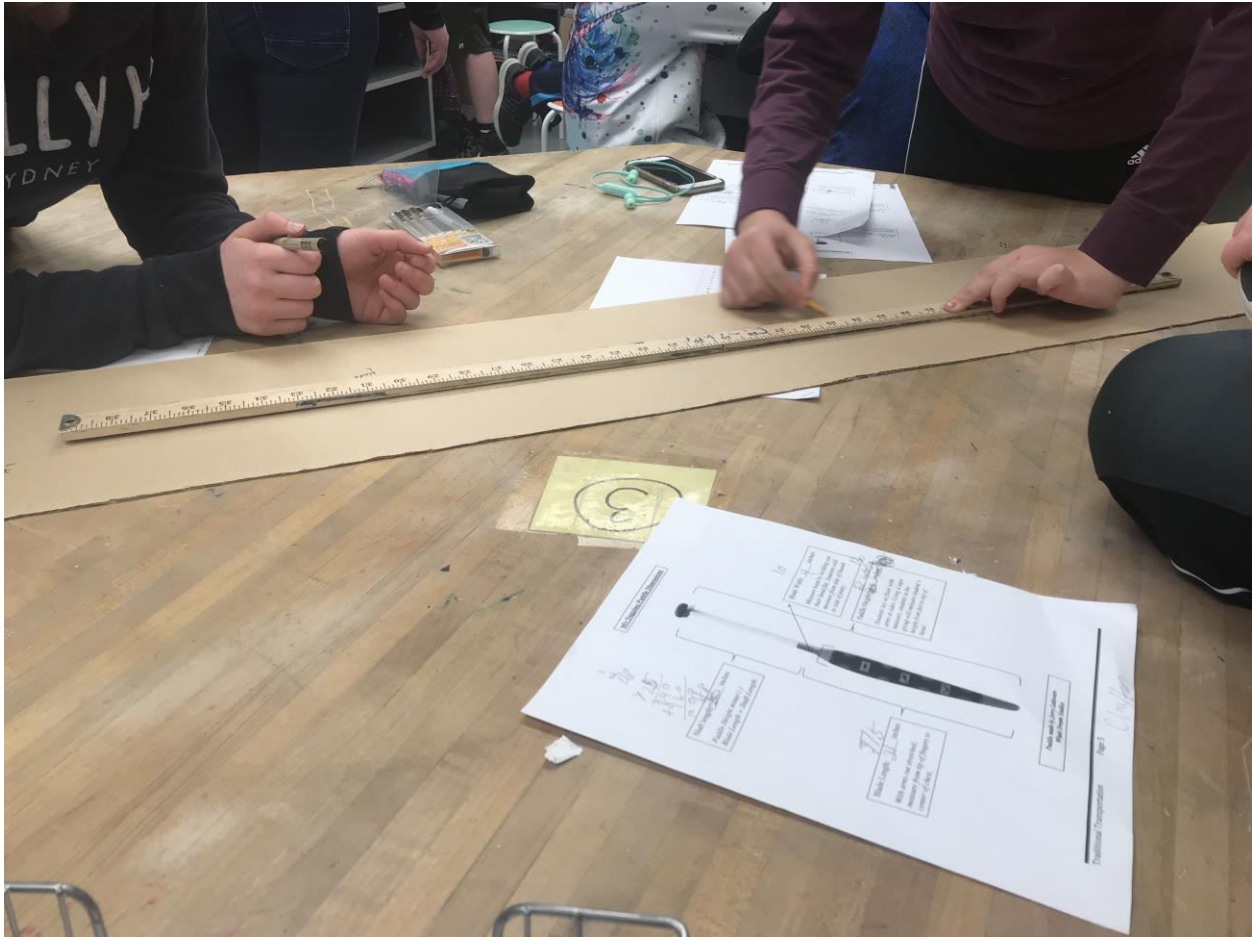


Sugpiaq Paddles located in the Cordova Historical Museum.
Photo courtesy of Nick Jordan

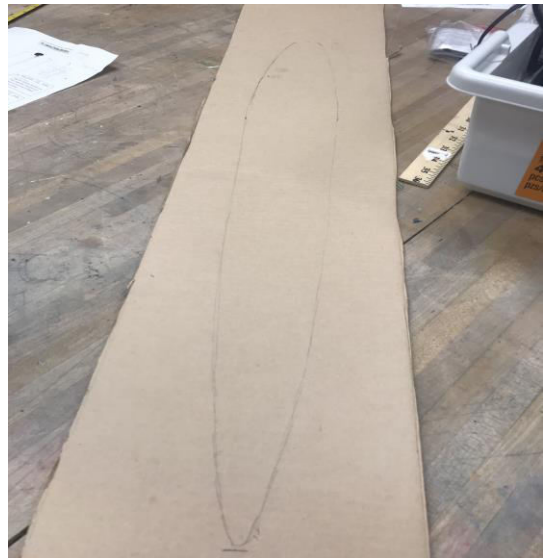
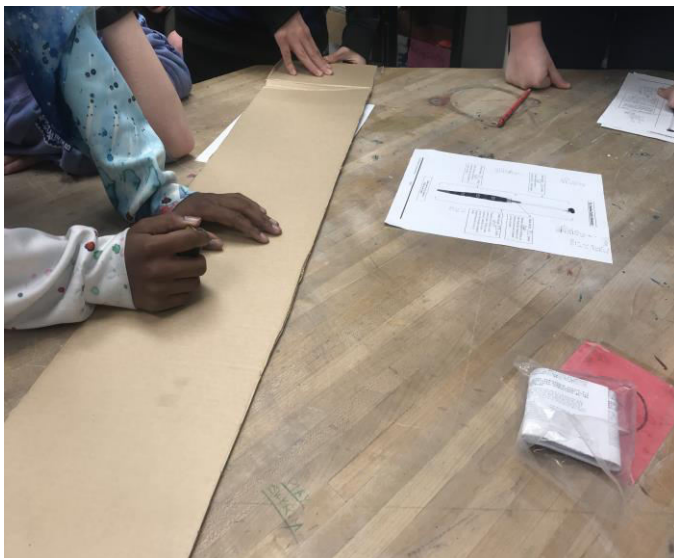


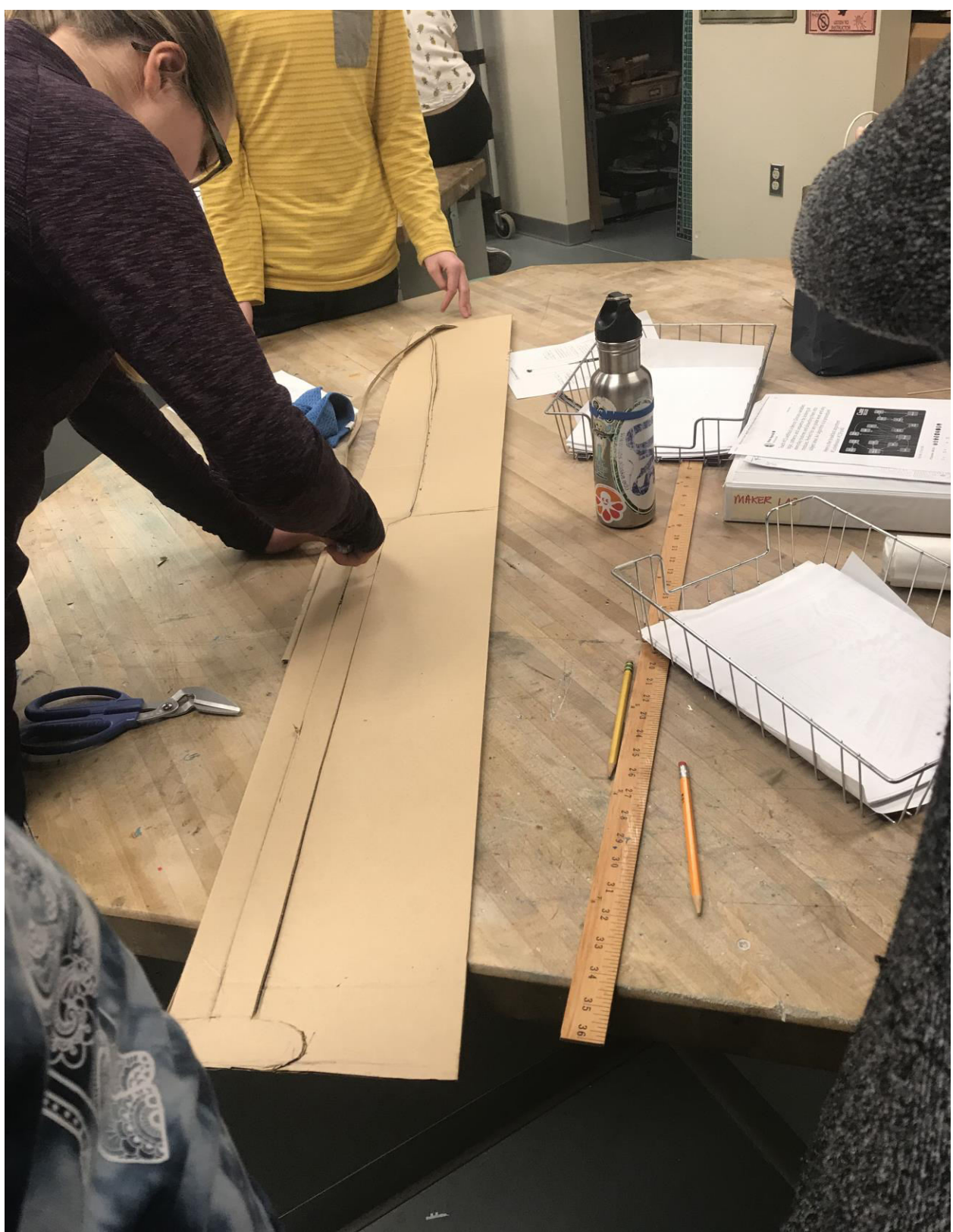
Close-up of the Sugpiaq Paddle located in the Cordova Historical Museum. Photo courtesy of Nick Jordan

Students in Ms. Dixon's class working on the *Traditional Sugpiaq Paddle* lesson with Nick Jordan at Seward Middle School (Following photos courtesy of Nick Jordan, Seward)

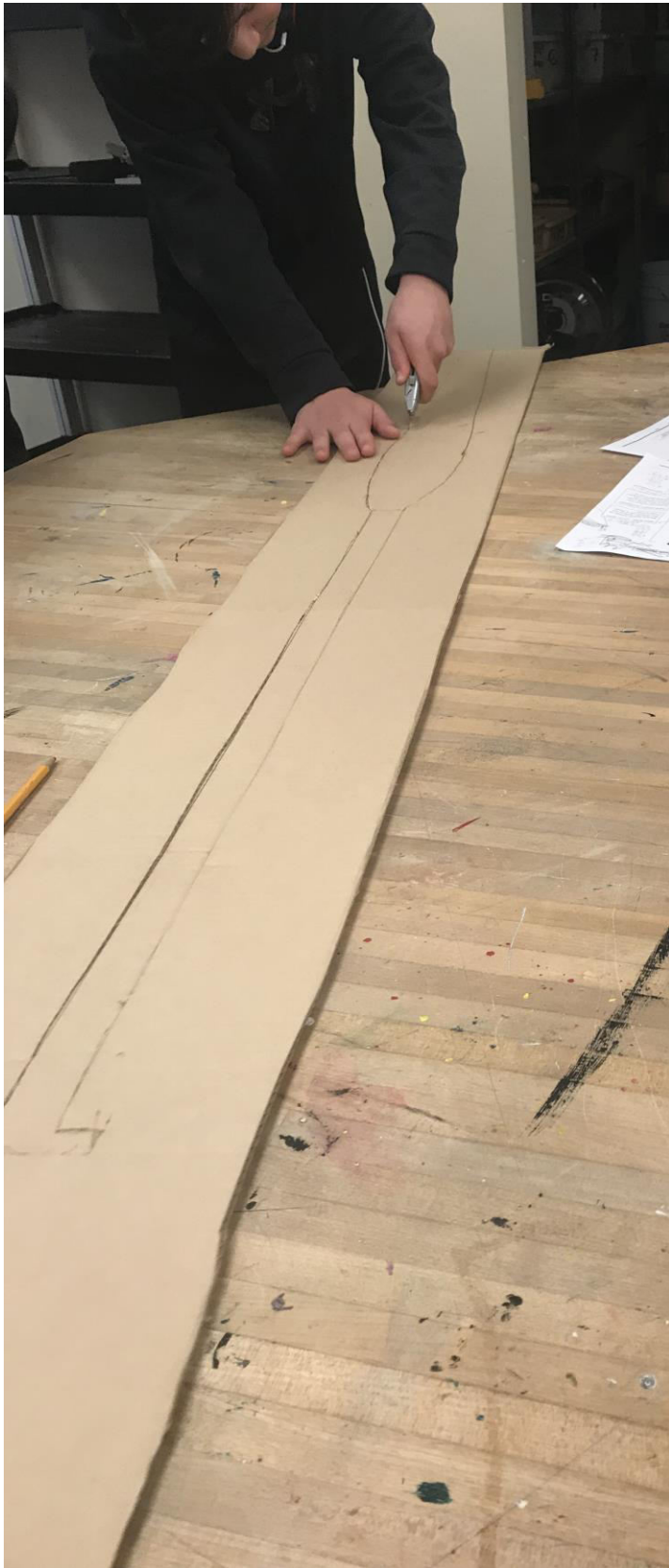


Note the filled out "My Sugpiaq Paddle Dimensions" worksheet and then drawing out paddle accordingly.

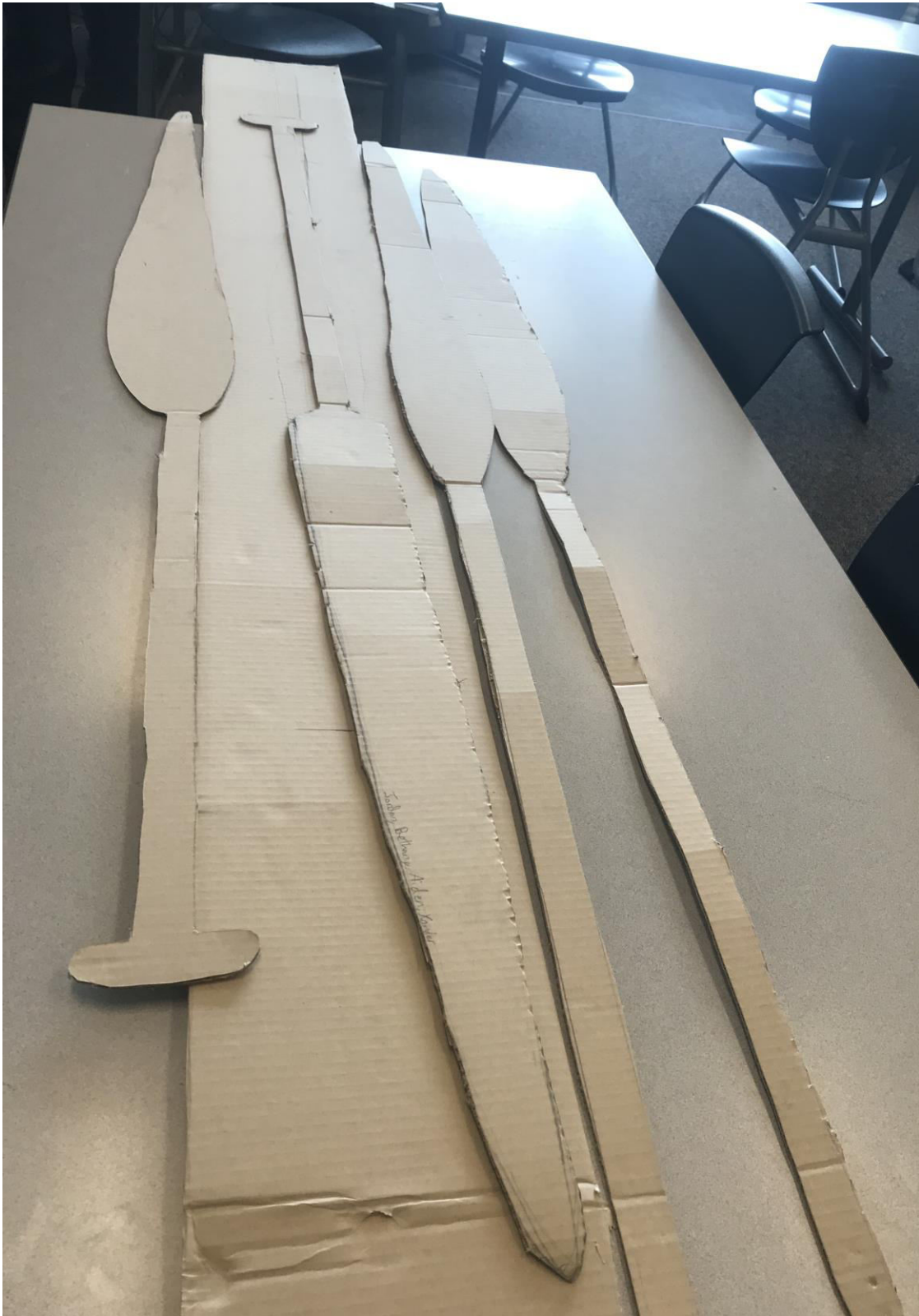




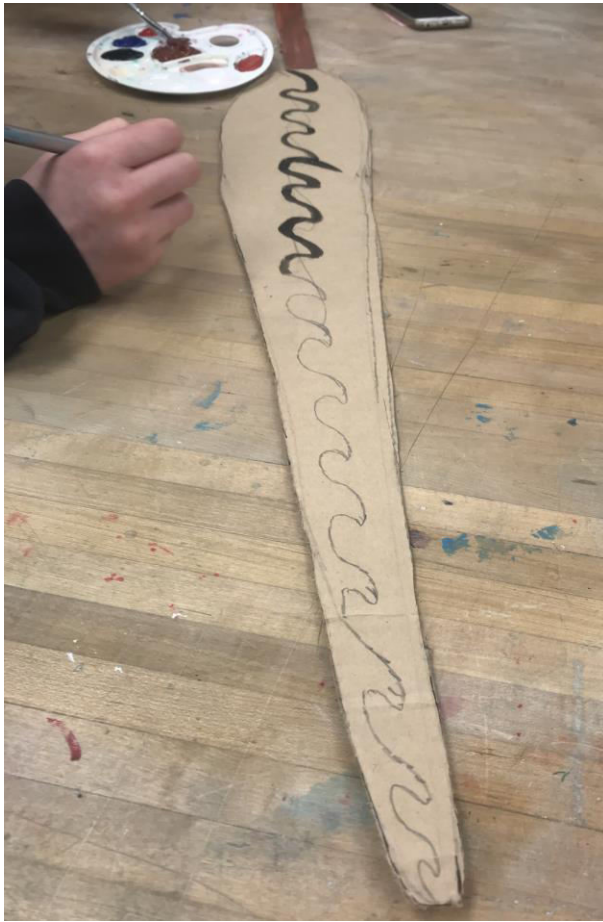
With an X-Acto knife, carefully cut following the outlined paddle.



Be sure to work on a cutting surface.



Cardboard paddles cut out to specific body measurements of students and ready to paint.



Draw out traditional designs with pencil.



Encourage painting with traditional colors.



Set aside and allow to completely dry.



Finished paddles made specifically to student's body measurements. Awesome job!

TRADITIONAL TRANSPORTATION: DUGOUT CANOE GR: 6-8 (LESSON 8, 9, 10)

Elder Quote/Belief: “Summer came and they would go around by boat. They made their first dugout canoes. They chopped down large cottonwood, and fashioned that into a canoe. They went in that into Eyak Lake. Then they tried spruce instead of cotton wood. That too was good. They carved large boats out of spruce.”

-Anna Nelson Harry Recorded in 1965, Yakutat.

Grade Level: 6-8

Overview: The Eyak people traditionally carved dugout canoes throughout the Chugach Region. “The canoes were so seaworthy that they were used not just for interisland voyages to visit relatives or allies, but also to wage war and to engage in trade missions over hundreds of miles. In fact, dugout canoes plied the waters between Southeast Alaska, (Eyak) and Kodiak Island in the days before the coming of Europeans”.

ECHO Space <http://www.echospace.org/articles/273/sections/665.html>

Standards:

<i>AK Cultural:</i>	<i>AK Content Science:</i>	<i>CRCC:</i>
E4: Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them. A student should determine how ideas and concepts from one knowledge system relate to those derived from another knowledge system.	B2: A student should understand and be able to apply the concepts, models, theories, universal principles, and facts that explain the physical world.	MC1: Different kinds of wood have different qualities and different uses; wood can be obtained from the forest and from driftwood.

Lesson Goal: Learn about the process of making a dugout canoe. Students will carve a dugout canoe model using balsa wood blocks and carving tools.

Lesson Objective(s): Students will:

- Learn Eyak and Sugt'stun vocabulary for dugout canoe
- Learn the uses and purpose of the dugout canoe
- Learn about cultural groups who also carved and used the dugout canoe for travel.
- Design and carve a model dugout canoe
- Test carved dugout canoes for stability, load and tracking (straight line)

Vocabulary Words:**Sugt'stun Dialects**

English:	Prince William Sound:	Lower Cook Inlet:	Eyak:
Dugout Canoe	pattakun	pattakun	AXAkih
Spruce		Nupak	lis
Cottonwood		ciquq	t'AXgsg
Carving		Pulluqu	
Adze			XAt'aa
Steam		arilliaq	

Materials/Resources Needed:

- If possible, invite an Elder or Recognized Expert from the Region to share their traditional ecological knowledge (TEK) and expertise to enrich the lesson(s).
- Balsa Wood Blocks 2"x 2"x12"
- Wood Carving Tools
- Sand paper sheets (120 grit)
- Paint (Crayola Acrylic)
- Wood carving gloves
- Band-Aids
- Set of weights (one, two and four ounce)
- Plastic tub

Videos:

- NW Coast Indian Canoe Legacy Project (14 video series)
 - <https://www.youtube.com/playlist?list=PLzm0g19jcPtXiHmv9EiE34LqkBE6LUXjC>
- Sea Alaska Canoe Project: <https://vimeo.com/195491983>

Books/Documents:

- *Qayaqs & Canoes; Native Ways of Knowing*, pages 101-119
- *NORTHWEST COAST ART/DESIGN* for carving (x4 for student reference)
- *Eyak Legends of the Copper River Delta, Alaska* page 104
- Eyak History and Language by Anna Nelson Harry 1965 Yakutat
- Article: ECHO Space <http://www.echospace.org/articles/273/sections/665.html>

Teacher Preparation:

- Invite an Elder or Recognized Expert that could share their expertise on the lesson content.
- Before the Elder or Recognized Expert arrives, please review with all of the students, ways to show respect for the Elder during their visit.
- Locate and gather materials and resources needed.
- **NOTE:** Students will be carving balsa wood dugout canoes. This activity could take multiple days to complete.
- Prepare small working groups to share woodcarving tools.
- Locate a block of balsa wood roughly 2"x2"x12" for each student.
- Make copies of the article from ECHO Space for students to read.
 - <http://www.echospace.org/articles/273/sections/665.html>
- Preview the recommended videos on the dugout canoe carving and steaming process. (Listed above.)
- Set up Smartboard with links to the videos listed above.
 - NW Coast Indian Canoe Legacy Project (14 video series)
<https://www.youtube.com/playlist?list=PLzm0g19jcPtXiHmv9EiE34LqkBE6LUXjC>
 - Sea Alaska Canoe Project video of carver Steve Brown on how to make a dugout canoe.
<https://vimeo.com/195491983>

Opening:

The Sugpiaq and Eyak people of the Chugach Region developed distinct styles of boats used for travel to gather resources, transport people, hunting, warring and attend celebrations. Today, we are going to learn about the dugout canoe. The dugout canoe has been widely used throughout the world. The Eyak, Sugpiaq, Tlingit and Pacific Northwest Indians developed the largest most impressive dugout canoes. Some of the largest canoes made from a single red cedar tree would measure 65 feet in length. We will also look at the designs the Eyak and Pacific Coast Indians used on the dugout canoes. In culmination you will be carving a dugout canoe from balsa wood using a canoe model as an example. Once you are finished carving will paint the canoe with culturally relevant designs.

***Carving can be a dangerous activity; student must wear safety gloves while handling carving tools and carving. ***

Activities:

Class I:

1. Display the Dugout canoe model and poster board.
2. For prior knowledge test, ask the students to prepare 3 questions about dugout canoes; their size, type of material, uses, carving methods, etc. on a sheet of paper and to pay close attention- to guest and the article so able to answer their own questions later after lesson.
3. Introduce Elder or Recognized Expert to share their expertise on building dugout canoes.
4. Ask the students to read the article from Echo Space to give background knowledge of the dugout canoe. <http://www.echospace.org/articles/273/sections/665.html>.
5. Ask the students to go back and answer their prior questions after reading the article.
6. Explain to the students that they will be watching several videos and they will need to take careful notes. Items to focus on are;
 - a. History of dugout canoes
 - b. Design, carving, and steaming method(s) of canoe.

7. Show video #1- Introduction to [NW Indian Canoe Project](#). Optional: After watching video #1, optional to choose any of the following videos to share as resources.
8. Show Sea Alaska Canoe Project video of carver Steve Brown on how to make a dugout canoe. <https://vimeo.com/195491983>

Class II: (3 days)

1. Students will design and carve a dugout canoe from balsa wood based on photographs and the model dugout canoe.
2. Students will draw and design a paper template of a dugout canoe to use as a reference for carving.
3. Review the *Carving, Wood Working Safety Checklist* and rules. All students must sign that they understand and will abide by the rules.
4. Distribute balsa wood, group carving tools, and carving gloves.
*****Carving can be a dangerous activity. Student must wear safety gloves while handling carving tools and carving*****
5. The carving process could take three days at 30 minutes to complete. Carving tools are to stay with kit. When students are finished carving, then they will need to sand their boats smooth. Students have an option to paint traditional designs on their boats with the included paints.

Optional Class III: Testing out Canoes

- i. Once the dugout canoes are complete, explain the testing activities (See attached **Dugout Canoe Testing Rubric**)
2. Students will test their canoe 3 different times for:
 - a. FLOTATION
 - i. Did your canoe float? Sink? Or turn over? How can you modify your canoe to float properly? *This is important in order to complete the next couple of tests.*
 - b. LOAD CARRYING CAPACITY
 - i. Measure your canoes load carrying capacity for both ounces (oz.) and grams (gm.).
 - c. TRACKING IN STRAIGHT LINE
 - i. Does your canoe track in a straight line? Or veer to the left or right? How can you modify your canoe to track in a straight line?
 - d. MODIFICATIONS
 - i. Did you make any modifications between your tests of your canoe?
3. Document results on the **Dugout Canoe Testing Rubric**
4. Discuss findings and what might they have done differently when carving dugout canoe.
5. Document their findings on the **Dugout Canoe Testing Rubric**

Assessment:

- Students can retell information learned regarding dugout canoes from the Echo Space Article and the NW Indian Canoe Project video.
- Students successfully completed their carving of a dugout canoe.
- Dugout canoe was tested and documented for load carrying capacity, floating, and tracking in a straight line.

Dugout Canoe Testing Rubric:

Student Name:	Floating (Y/N)	Load Carrying Capacity:	Tracking:	Modifications?: (Specify)
Hypothesis:				
Test #1				
Test #2				
Test #3				
Findings:				

Hypothesis: What will happen to your canoe for the three experiments (floating, load capacity, tracking).

Floating: Did your canoe float? Sink? Or turn over? How can you modify your canoe to float properly to complete the next exercises.

Load Carrying Capacity: Measure your canoe's load carrying capacity for both ounces (oz) and grams (gm).

Tracking: Does your canoe track in a straight line? Or does it veer to the left or right? How can you modify your canoe to track in a straight line?

Modifications: Did you make any modifications between your tests of your canoe? Specify what modifications you made to your canoe.

Findings: Document your results for the three tests. Did your canoe perform better or worse after your modifications? How would you design your dugout canoe differently?

Carving, Wood Working Safety Checklist

1. Judgement

- Knives and other carving tools are not toys.
- Carve only under the direction of a teacher or adult supervision.
- Carve only when you can focus on your work. Avoid distractions
- Never bring a knife to school for carving.
- Horseplay is not allowed near or around carving and knives.

2. Caring for your tools

- Keep tools and knives sharp and clean
- Wear protective safety gear, such as: carving gloves, safety glasses and mask.
- Store tools in a safe place and never bring tools home.

3. Work Environment

- Use a clamp, and carving board for better control when carving small or shaped objects.
- Use a clamp to hold down wood while using a coping saw.
- Use a bench, sturdy chair and appropriate lighting.

4. Handling Knives

- Never pass a knife across to other people at the table.
- Never carve in your lap or near your face or wrists.
- Take small carving strokes for more control.
- Never “muscle” a project when carving.
- Always make sure your knife is sharp. Dull knives are challenging and dangerous to carve with.
- Never pound or “hammer” your carving knife to make a cut.

5. Choices

- Choose the correct wood for a project
- Lay out your project and have plenty of space around you while cutting them out.

I have read, understand and will abide by the carving safety rules.

Student Signature_____ **Date**_____



Photo of Dugout Canoe Model and paddles courtesy of Bill Smith