L'EIWÚ KA HÉEN

Wood & Waterways: A Look at Tlingit Canoes

A JUNEAU-DOUGLAS CITY MUSEUM
PLACE-BASED HISTORY KIT

GRADE 3-5

DEVELOPMENT OF THIS EDUCATION KIT FOR THE JUNEAU-DOUGLAS CITY MUSEUM WAS MADE POSSIBLE BY THE ALASKA STATE MUSEUM GRANT-IN-AID PROGRAM

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Wood & Waterways: A Look at Tlingit Canoes

Grades: 3rd-5th

Time: 1.5 - 2 hours

KIT INCLUDES:	**MATERIALS NEEDED:**	**KIT DESCRIPTION:**
• Lesson guide • Tupperware and foil sheets • Student sheets (boat design challenge) • Wood & Waterways PPT • Model canoe • Tlingit Aaní Map • Links to "Coming Ashore" and "The Local: Master Carver" videos • Canoe Building Puzzle Sets	• STEM boat design materials (class set: can include modeling clay, foil, wax paper, tape, scissors, straws, coffee filters) • Container to test student boats (individual storage bins or class kiddie pool works well) • Pennies or paperclips to test boat capacity	Students design a boat using everyday materials and present their findings. Students describe what a boat is (specifically a canoe), what its purpose is, and what makes it effective. Students observe a model Tlingit canoe, learn about Tlingit navigation of waterways and use of local materials, Tlingit paddling phrases, and the steps of canoe construction at the Juneau City museum.
VOCABULARY: <u>ENGLISH:</u> Geography, Navigation, Adze, Waterways, Capacity, Displacement, Symmetrical, Density, Felling <u>TLINGIT:</u> Aak'w Kwáan, Aaní, Yaakw, Tsaa Eixi, T'aaku, Kwáan Aaní, Loon, Tákl	**STANDARDS:** **NGSS: 3-5 ETS1 Engineering Design** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. **Alaska Content Standards: Geography – D:** A student should understand and be able to interpret spatial (geographic) characteristics of human systems, including migration, movement,	**CONTENT CONNECTIONS:** Math Social Studies Tlingit Culture Science

Dáax̲ G̲ayéis' S'oow X̲út'aa X'éex'w X̲'aan Héen	L'eiwu A Xées'i A K'óol' Té X'áakw X'átgu	interactions of cultures, economic activities, settlement patterns, and political units in the state, nation, and world. **Alaska Cultural Standards for Students: – D** Culturally-knowledgeable students are able to engage effectively in learning activities that are based on traditional ways of knowing and learning.	
OBJECTIVES: Students will… • Explain the significance of wood and waterways to the Tlingit people • Demonstrate the steps of building a Tlingit canoe • Describe what makes the Tlingit canoe efficient		**ASSESSMENT CRITERIA:** Students will be able to answer… • Did you learn something new? What? • Did this experience change how you think about the topic? • Is this something you can use in the future?	
PREPARATION:	Prepare and test foil demo with kit materials Tupperware full of water, foil cut into 2 flat squares of equal dimensions Make copies of the student sheet Preview Wood & Waterways PPT provided on thumb drive, ensure video links work. Look up and preview "Coming Ashore" and "The Local: Master Carver" videos Schedule a trip to the Juneau-Douglas City Museum		

ENCOUNTER

<u>Part One</u>: Concept of a "boat" class discussion questions (15 minutes)

- What is a boat?
- What is its purpose? (To transport goods, connect people, fishing, hunting, ceremonies, trade, and war)
- What makes a boat effective? (ability to float, ability to hold people and goods, ability to turn, ability to go straight, and seaworthiness)

What Floats? Demonstration: Show the Tupperware full of water and 2 pieces of foil cut into equally shaped squares. Ask a student to get one piece of the foil to float on the water.

- *Can they do it?*
- *Can another student make it sink? (crumpling the second piece will cause it to sink)*
- *What made one piece float and one piece sink?*
- *How does this relate to our everyday lives in Southeast Alaska? (boats utilize this concept)*

This phenomenon is called **water displacement,** the ability of any object placed in a fluid to cause the fluid to no longer occupy that space. If the object's density is greater than water, it sinks.

Making an object to float on water needs to do several things – it should float by itself, with additional objects or people in it, be able to go straight (occasionally backwards), be able to turn, and be able to withstand variable water and weather conditions.

Optional Extension Activity: Look up "SciShow Why Do Ships Float" on YouTube to share video of cruise ship water displacement. Be sure to preview the video before sharing with your class.

<u>Part Two</u>: "Artful Teaching" See, Think, Wonder (10 minutes)

Show the "See, Think, Wonder" (first 7 slides of PowerPoint).

- *What do you **see**?*
  Ask students to share what they see. One way to help focus only on what they see is to ask them to be able to point at the photo while they share.
- *What do you **think** about the things you see?*
  Now students have an opportunity to share their connections to prior knowledge and to make interpretations.
- *What do you **wonder** about?*
  Students will think about questions they have about the images.

After looking through the images the first time, take another quick look at slides 2-6 again to see if students notice a common occurrence or them within the images.

ENGAGE

The Challenge: Hands-On Learning Activity (45 minutes)

Hand out the **student challenge sheet** and review with the class before they are released to begin the challenge.

Optional Math Extension Activity: In addition to the challenge of building a boat that can carry weight (such as paper clips or pennies), students can see if they can design the most cost-effective boat. **Additional materials needed:** Class set of - popsicle sticks, toothpicks, glue separated into small amounts in condiment saucers, playdough separated in small balls, and a cost chart. **Note:** Conclusion to the activity could include inviting in a Master Tlingit carver to discuss tree selection processes and the role of wood and waterways in trade.

Example Cost Chart:

Laax Red Cedar (popsicle sticks):	$50 each
Shéiyi Sitka Spruce (toothpicks):	$25 per 10 toothpicks
Tsaa eixí Seal Oil for waterproofing (glue):	$15 per saucer
X'átgu eixí Dogfish Oil for waterproofing (playdoh):	$10 per ball

REFLECT

Student Presentations: (30 minutes)

Students present their boat designs to the class explaining the characteristics of the boats they chose to make (size, shape, boat capacity, costs, any artwork incorporated, and inspiration for design) and the materials used. They will also describe the process they went through, did it work on the first try, if not, what modifications were made, were they able to get it to work at all? If no, why do they think their boat was not successful.

After experiencing designing a boat, describe what things the Tlingit and Haida people considered when designing a canoe?

Tlingit Canoe Model: (10 minutes)

Present the kit's canoe model to the class.

- What similarities and differences in design do you notice between your team boat and the canoe?

Puzzle: (30 minutes)

Refer to the Wood & Waterways PowerPoint (slides 8-12) to review the importance of canoes as the cornerstone of Tlingit culture. On slide 13, students can arrange puzzle pieces into the 12 steps of Tlingit canoe making. Students can compare their order with the remainder of the PowerPoint (slides 14-25). The correct order follows the PPT steps and additional prints can be made via the thumb drive teacher file.

ASSESSMENT

- Use "Self-Evaluation Checklist" on the "Wood & Waterways Student Sheet"
- The puzzle pieces can be used as an informal pre- and post- assessment if visiting the museum exhibit

EXTENSIONS

- Invite a Tlingit elder, knowledge bearer, or master carver to the class to discuss the significance of the tree selection process, the difference between Red Cedar and Sitka Spruce, and the role of canoes in Tlingit culture.
- Visit the Juneau-Douglas City Museum to see the L'eiwú Ka H**é**en exhibit in person
- Students can gift the knowledge of canoe making to someone new (family or friend) by sharing the steps of the process through song, artwork, a recipe book, or product of their choice.

ADDITIONAL RESOURCES

LINKS:

Juneau-Douglas City Museum

https://beta.juneau.org/library/museum

Elaine Abraham's Keynote Speech on "Aas Kwaani – The Tree People"

https://www.youtube.com/watch?v=jgfH77HvaHQ (min 12 :25 through 55:55)

Artful Teaching Routine

http://www.artfulteaching.org/uploads/6/9/4/1/69414177/at_see_think_wonder.pdf

WOOD & WATERWAYS STUDENT SHEET

Name of Team Members:

Date:

Instructions
Design a boat

- Using the materials, design a boat that can carry the most weight.

The Problem: Fishermen need to deliver 100 pounds of gáax'w *(herring eggs – represented by pennies or paperclips) harvested at* Indian Point (near the ferry terminal) and want to paddle to Haines. Since the route is 40 miles by water, it is important for the fishermen and gáax'w to stay safe and not tip over.

The Challenge: You have been asked to design a model of a boat to transport the fishermen and gáax'w from Juneau to Haines.

The Materials: You must construct your model boat using the materials provided.

Things to consider

- What boat design might work best for this challenge?
- How heavy are your materials?
- How will the extra weight of the gáax'w affect your boat?

Make a plan

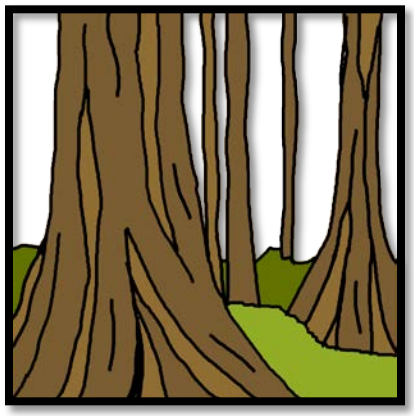
- Brainstorm some ideas with your team.
- Decide on some materials to try and list them.
- Make a sketch of your idea **before** you begin to build.

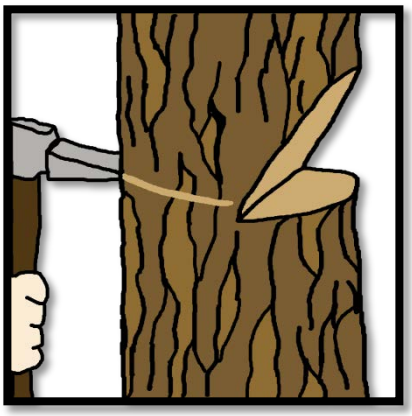
When you are finished you will:

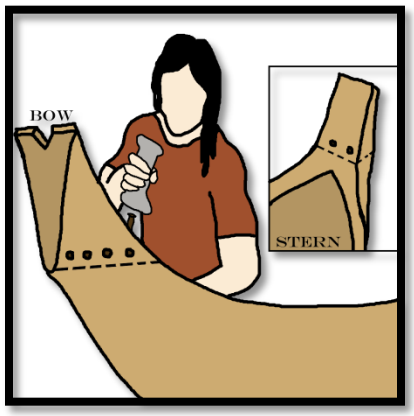
- Present your boat design to the class:
  - Explain the characteristics of the boat you choose to build.
  - Explain the materials you used to design the boat.
  - Demonstrate whether or not the boat worked.
  - Describe the process you went through,
    - Did it work on the first try?
    - If not, what modifications were made?
    - Were you able to get it to work at all?
    - If not, why do you think the boat was not successful?
- After experiencing making a boat, describe what things the Tlingit and Haida peoples considered when designing a boat.

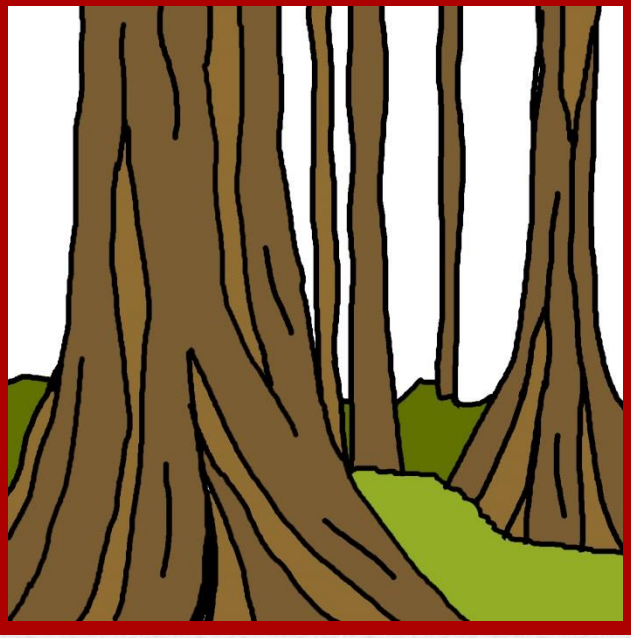
Self-Evaluation Checklist

YES	NO	
		Our team brainstormed ideas together and all voices were heard.
		We created a sketch and included a materials list.
		We tried our boat and made modification if needed.
		We thoughtfully discussed what the designers of Tlingit canoes must have considered when designing canoes.
		We spoke loudly and clearly when presenting our boats.
		We listened carefully and respectfully to other teams' presentations.






BOW
STERN



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See. Think. Wonder.

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Canoes approach Douglas during 2016 Coming Ashore Ceremony, JDCM 2017.53.001

The people of the Aak'w Kwáan and T'aaku Kwáan have depended on their ability to navigate the **geography** of Southeast Alaska for thousands of years. Here, heavy **rainfall** fills thousands of **streams** and **rivers**. Massive **mountains**, **glaciers**, and **ice fields** are no more than 30 miles from the **ocean** tidewater**.**

Tlingit Aaní

Tracey Arm, photo by Michelle Maria. Creative Commons; Pixabay.

Tlingit Aaní includes an intricate mix of **waterways** and forested **islands** which require a mode of transportation that allows the Tlingit to maneuver through **winding rivers**, **inside passages**, and **open sea waters**.

Héen

Alaska Indian War Canoe, 1915. Donated by the Harold Fossum Estate. JDCM 2005.06.147

The Tlingit created dugout canoes **(yaakw)** of various types and sizes to fit their transportation needs as marine hunters, fisherman, traders, travelers, and warriors.

Yaakw

Tlingit Aaní

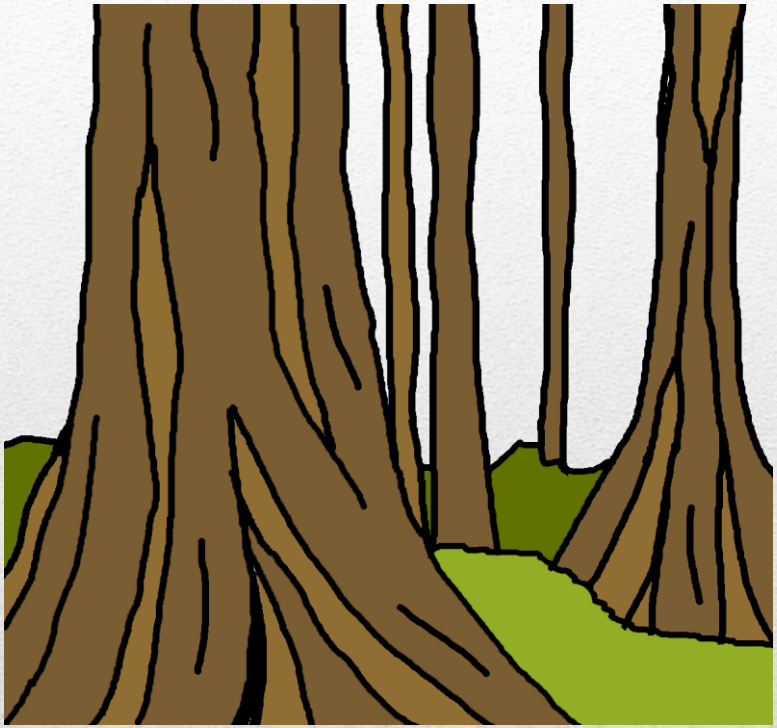
Their high dependence on a reliable vessel required a lot of attention to detail and overall mastery of **canoe-making** skills and techniques. "Nowhere else in the world was a dugout developed to such a degree of sophistication; no other people have a dugout that could match the speed, capacity and seaworthiness—or the elegant grace—of the sleek canoes of the Northwest Coast Indians" (Stewart, 1984, p.48).

Yaakw

Your Turn:

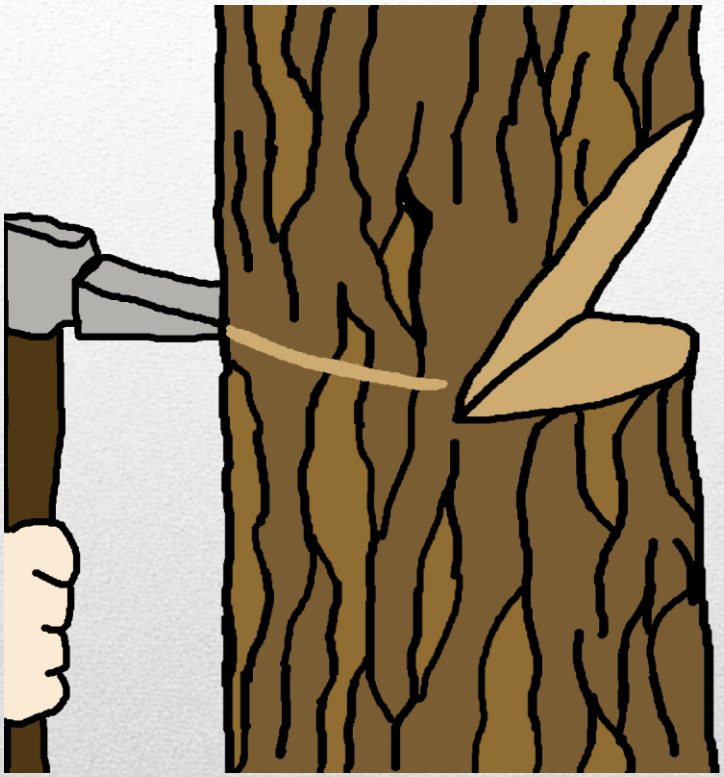
- Look at your canoe cards.
- Try to put them in order to show the steps of canoe making from start to finish.

How to make a Tlingit Canoe



Selecting a Tree: Trees that grow slowly in dry soil are preferred. Trees grown in wet ground have a less desirable spongy texture. The grain of the tree should be straight and free of knots. Once the proper tree is selected, a canoe-maker will speak to the spirit of the tree to show respect.

Step 1: Tree Selection

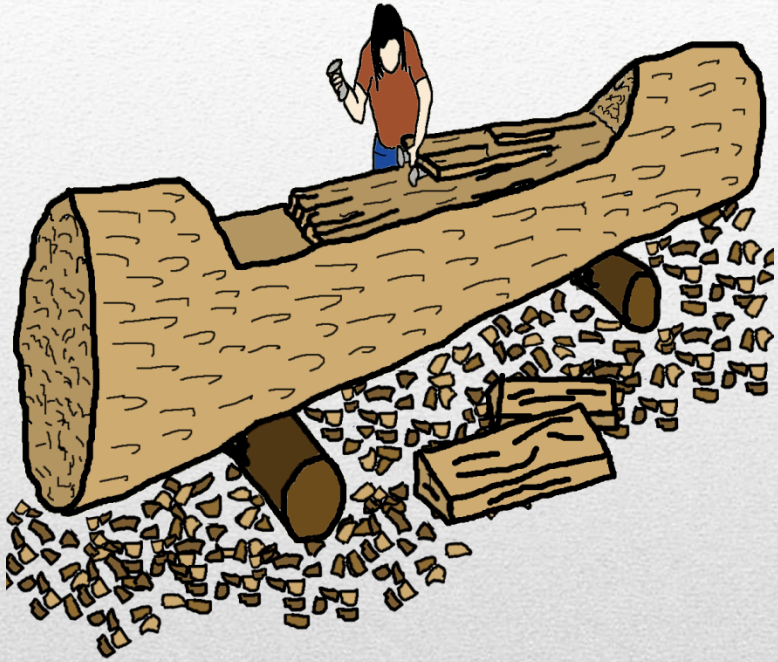


Felling: Felling, or cutting a tree is best in March or November when sap levels are lower. Before the acquisition of iron (Gayéis'), the tree would be scored and worked around with a stone adze (s'oow xút'aa), wedges (x'éex'w), and fire (x'aan). Modern canoe-makers use power tools, such as chainsaws, making the process much quicker.

Step 2: Felling

Removing the Bark: When the tree is down, the canoe-maker cuts the trunk to the required length, removes all the bark (loon) from the tree's exterior, and the upper surface of the log is flattened using wedges (x'éex'w) and hand mauls (tá<u>k</u>l).

Step 3: Removing the Bark



Rough Shaping: Using an adze (xút'aa), wedges (x'éex'w) and hand mauls (tákl), the canoe-maker roughly shapes the outside of the canoe (dáax) and narrows the ends.

Step 4: Rough Shaping

Shaping: The canoe-maker and his assistants turn the canoe (dáax̲) over to shape the exterior of the hull, bow (a xées'i), and stern (a k'óol'), ensuring it is symmetrical.

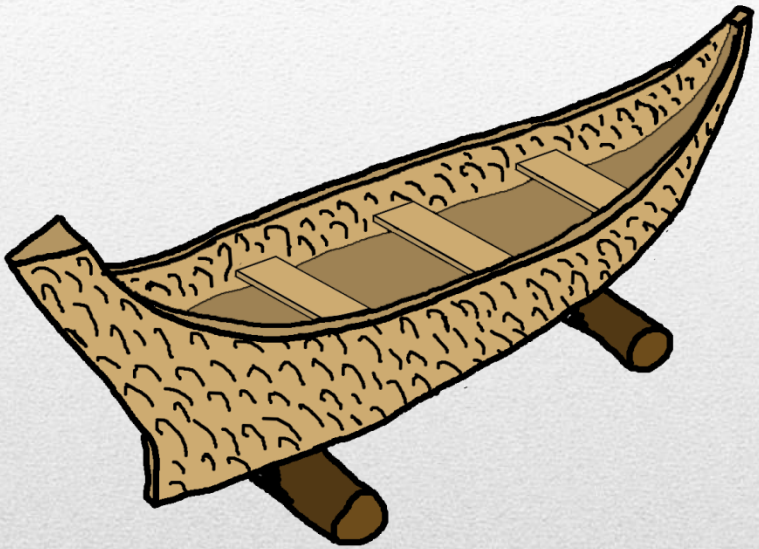
Step 5: Shape the Outside

Hollowing: The canoe (dáax̲) is turned right-side up again to hollow out the center. Most of this is done with a hammer (tákl̲) and chisel (tíyaa) or by burning the wood with hot rocks. Once a rough opening is made, an adze (x̲út'aa) is used to carve out the remainder of the interior to an even thickness. Once hollowed, the canoe is light enough to be transported back to the village for finishing.

Step 6: Hollow out the Center

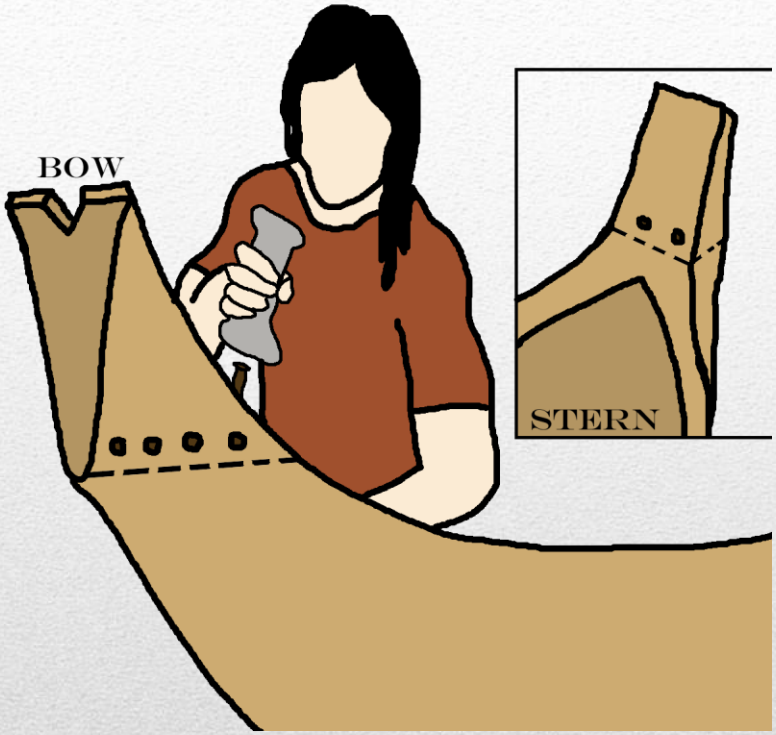
Steaming: When the canoe-maker is finished shaping the canoe, the sides of the canoe have to be spread to a size larger than the original log. A fire (x'aan) is built alongside the canoe and used to heat stones (té). The canoe (dáax) is partially filled with fresh water (x'áakw). Hot stones are added to the water to create steam. The canoe is covered with mats (gáach), or in modern times, a tarp, to trap the steam. The wood sides soften and are able to be spread outwards to the desired width.

Step 7: Steam Open



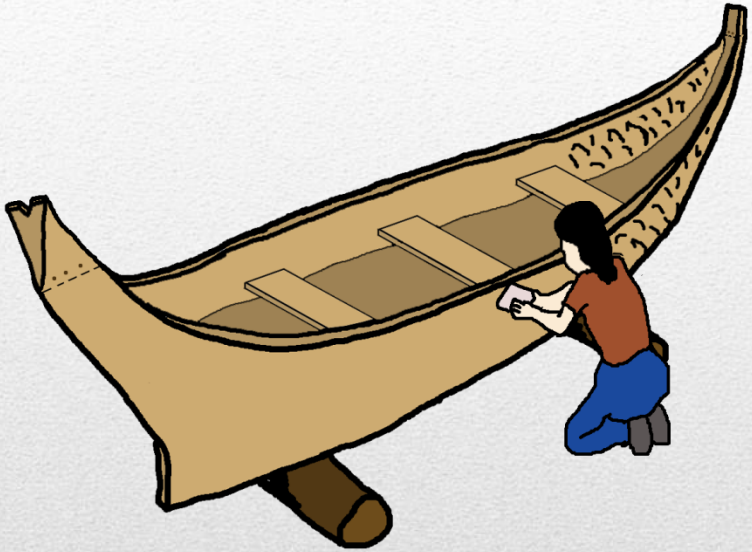
Cooling: Once the canoe (dáax̲) is at its desired shape and width, crosspieces are inserted, and the water and rocks are removed. As the wood cools, it sets as it has been stretched. The temporary stretchers are later replaced with permanent thwarts (yax̲ak'áaw), crossbeams often used as seats.

Step 8: Cooling



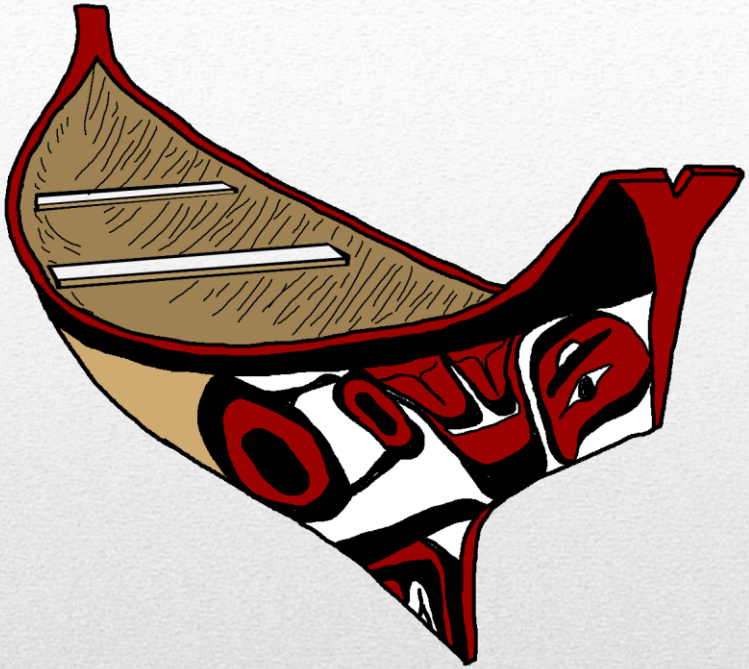
Attaching: Depending on the type of canoe, separate bow (a xées'i) and stern (a k'óol') pieces are attached to the canoe (dáax̲) by pegging.

Step 9: Attach Bow & Stern



Sanding: The canoe (dáax̲) is then sanded smooth with dogfish (x’átgu) skin or hemlock (yán) bows, depending on local custom. Sandpaper is used today.

Step 10: Sanding



Waterproofing: Once smoothed, the canoe is waterproofed using dogfish oil (x’átgu eix̲í) or seal oil (tsaa eix̲í). Today, modern water-proofers and sealers are used on the wood. Designs, such as clan crests, can be painted on the finished canoe at this time (yaakw).

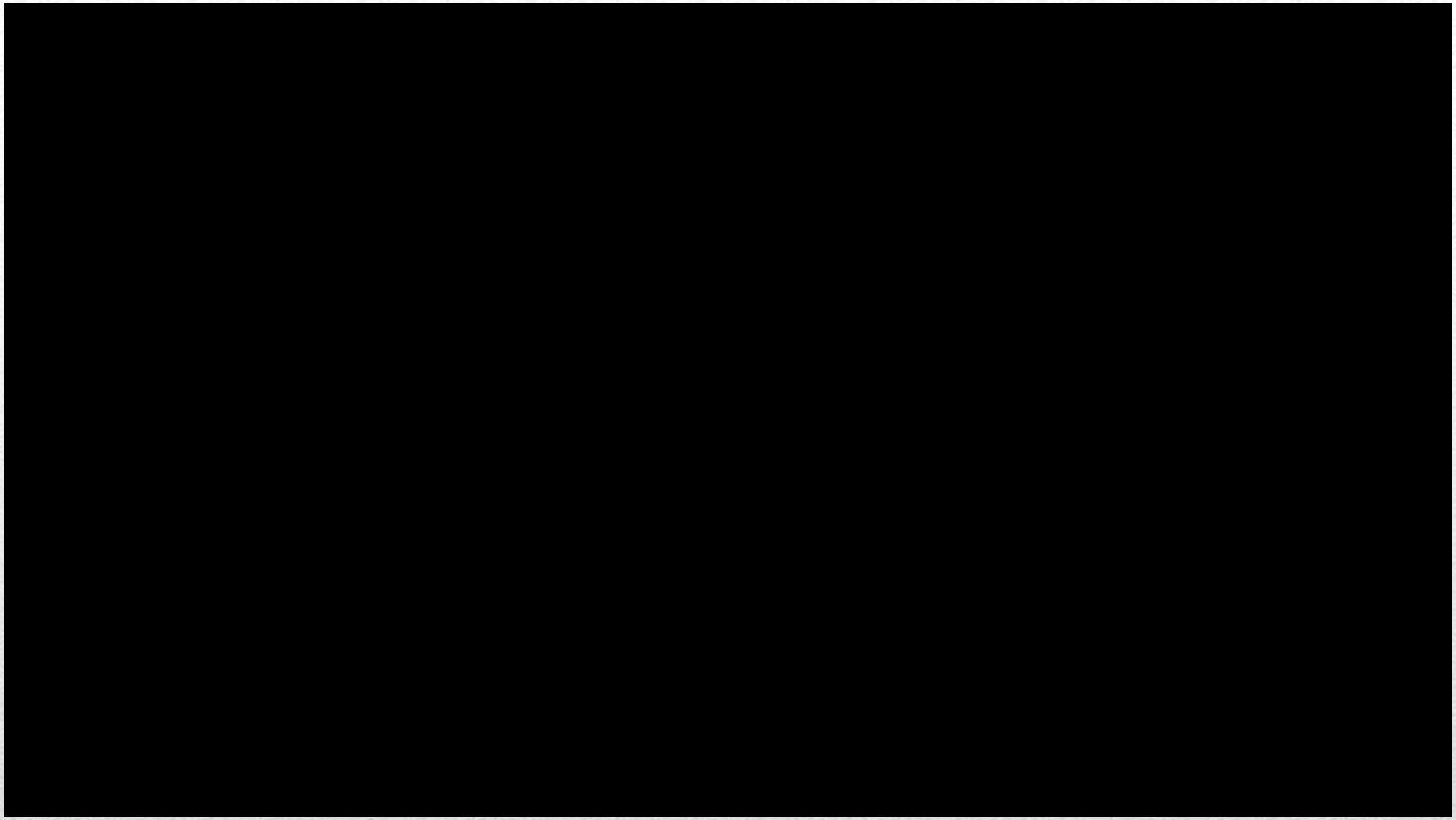
Step 11: Waterproofing

Testing: The finished canoe (yaakw) is tested for seaworthiness.

"I test the canoe in a place where the water is quiet, no wind, no current. I put a big rock in the stern and I push it way out. If it keeps going straight, you know you got a good canoe. Some fellow, they make a canoe in too much of a hurry… then it will twist and not go straight."

David Frank describing how he tests canoes (Cedar by Hillary Steward, pg. 56).

Step 12: Testing the Canoe



Coming Ashore 2016