

Overview:

In this lesson, students explore traditional kayak technology and how the science of waves impacted the design. NOTE: No one should ever go on a boat intentionally during a tsunami.

Targeted Alaska Grade Level Expectations:

Science

- [4] SE1.1 The student demonstrates an understanding of how to integrate scientific knowledge and technology to address problems by recognizing that tools (e.g., spear, hammer, hand lens, kayak, computer) and processes (e.g., drying fish, sewing, photography) are an important part of human cultures.
- [3] SE2.1 The student demonstrates an understanding that solving problems involves different ways of thinking, perspectives, and curiosity by identifying local tools and materials used in everyday life.
- [4] SE2.1 The student demonstrates an understanding that solving problems involves different ways of thinking, perspectives, and curiosity by identifying the function of a variety of tools (e.g., spear, hammer, hand lens, kayak, computer).

Writing

- [K] 1.1.1 The student writes about a topic by writing to express personal ideas using drawings, symbols, letters, or words.
- [1] 1.1.2 The student writes about a topic by writing about a single topic using drawings and a minimum of three complete sentences.
- [2] 1.1.2 The student writes about a topic by writing and organizing thoughts into a topic sentence and two supporting sentences.
- [3] 1.1.2 The student writes about a topic by writing a paragraph on a single topic with two or more supporting details.
- [4] 2.1.1 The student writes about a topic by writing a paragraph that maintains a focused idea and includes details that support the main idea.

Targeted Alaska Cultural Standards:

- [B2] Culturally-knowledgeable students are well grounded in the cultural heritage and traditions of their community. Students who meet this cultural standard are able to make effective use of the knowledge, skills, and ways of knowing from their own cultural traditions to learn about the larger world in which they live.

Objectives:

The student will:

- explore the parts of a traditional kayak that were made to travel through waves;
- create a model *qayaq* or *iqyaġ*; and
- draw and describe key design components of traditional kayaks for travel through waves.

Materials:

- Internet access
- Crayons or colored pencils
- Scissors
- Clear tape
- STUDENT WORKSHEET: “*Qayaq* or *Iqyaġ*” copied onto cardstock
- STUDENT WORKSHEET: “*Qayaq/Iqyaġ* Journal” Grades K-2 or Grades 2-4

Whole Picture:

The traditional names for the kayak are *qayaq* in *Sugt'stun*, the *Alutiiq* language, and *iqyaġ* in *Unangam Tunuu*, the language of the *Unangan/s*. Another term for kayak that is commonly used is *baidarka*, of Ukrainian origins.

“It seems to me that the Aleut *baidarka* is so perfect in its way that a mathematician himself could hardly add anything to the perfection of its sea going qualities (Veniaminov, 1840: 222).”

The indigenous peoples of the Aleutian Arc held intimate knowledge of the sea. This knowledge helped them understand when and where to travel as well as how to travel across the sea. The impact of waves on an ocean-going craft and the need for speed when hunting influenced kayak design of the *Alutiit* and *Unangan/s*.

Key design elements of the *Alutiiq* and *Unangaġ* kayaks:

Parts of the frame are lashed together. Nails or screws are not used. In his ethnographic notes, Father Ivan E. Veniaminov described the use of bone and flexibility in the wooden frame:

In the best one-hatched *baidarka*, in order to give them speed, they inserted as many as 60 small bones in all the joints, the bones were used as plugs, the end of the axis, the locks, plates, etc. When such a *baidarka* was in motion, almost every part was in movement... The keel is always in three pieces in order that the *baidarka* may have movement when on the run or, as they say, that it may “bend” over the wave.

G.H. von Langsdorff, a naturalist, also commented on the use of bone to protect from the shock of waves.

In some places, where the different pieces of the skeleton are fastened together, two flat bones are bound cross-ways over the joint in the inside and this the chief assured me was of the greatest use in stormy weather. As the fastenings are apt to be loosened by the shock of the waves, these bones contribute essentially towards preventing such an inconvenience; but this art is not known to all, and is kept very much a secret by those who possess it. (Langsdorff, 1814)

A sheathing of sea lion or seal skin contained the flexible frame of the boat.

Alutiiq boatbuilder, Nick Tanape Sr. of Nanwalek commented that the bifid or bifurcated bow allowed the bottom portion to cut through a wave as the top section provided the boat with a planing surface.



It helps when you're out there in the rough water. It definitely works. I don't know whose idea it was, but you would have to be very smart to figure that out. They traveled in very rough seas out here. I've been in a boat where a forty- or fifty-foot boat couldn't travel where our people traveled in their fifteen- to sixteen-foot kayaks. (Steinbright, 2001)

Activity Preparation:

Follow the directions on STUDENT WORKSHEET: “*Qayaq* or *Iqyaġ*” to make a model.

Activity Procedure:

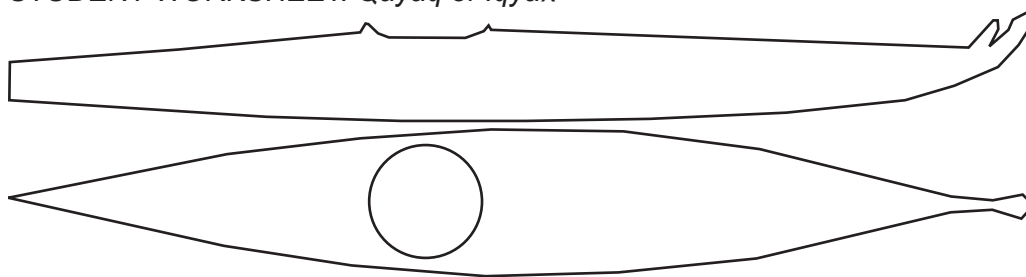
1. Explain that students will learn how the *Alutiiq* and *Unangan/s* developed an important tool that was made to travel fast across ocean waves, the kayak. Explain the local traditional terms for the kayak, *qayaq* in *Sugt’stun*, the *Alutiiq* language, and *iqyaġ* in *Unangam Tunuu*, the language of the *Unangan/s*. Encourage the use of the local term throughout the lesson in place of “kayak.”
2. To view traditional kayaks, access *Alaska’s Digital Archive* at <http://vilda.alaska.edu>. Enter a search term of “kayak.” Two images showing kayaks of *Alutiiq* and *Unangaġ* style include “Aleut in a *qajaq* (kayak) off the coast of St. Paul” and “Canoes of *Oonalashka*.” Use the information from the *Whole Picture* section and the model kayak to describe key design elements for waves. Other features to point out using the images include the use of single-blade and double blade paddles, as well as the use of one, two, or three hatches in a kayak.
3. Distribute crayons or colored pencils, glue, scissors and STUDENT WORKSHEET: “*Qayaq* or *Iqyaġ*” copied onto cardstock to each student. Instruct students to color then assemble their own model *qayaq* or *iqyaġ*. For younger students, it may be appropriate to complete this activity with older student helpers to aid with the cutting, folding and taping.
4. Distribute colored pencils and STUDENT WORKSHEET: “*Qayaq/Iqyaġ* Journal” for student completion.

Extension Ideas:

- If there are traditional kayaks in your community, take a field trip to go investigate one. Compare the craft to other boats.
- Invite an Elder or traditional boat builder to talk to about the boats and how they are made.

Answers:

STUDENT WORKSHEET: *Qayaq* or *Iqyaġ*



STUDENT WORKSHEET: *Qayaq/Iqyaġ* Journal (Grades K-2)
Students writing and drawing should depict a *qayaq* or *iqyaġ*.

STUDENT WORKSHEET: *Qayaq/Iqyaġ* Journal (Grades 2-4)

1. The drawing should depict a *qayaq* or *iqyaġ*.
2. Description of how the design elements are made for traveling over ocean waves.

Name: _____

Qayaq or Iqyaġ

Student Worksheet



Grades
K-4

You will need:

colored
pencils



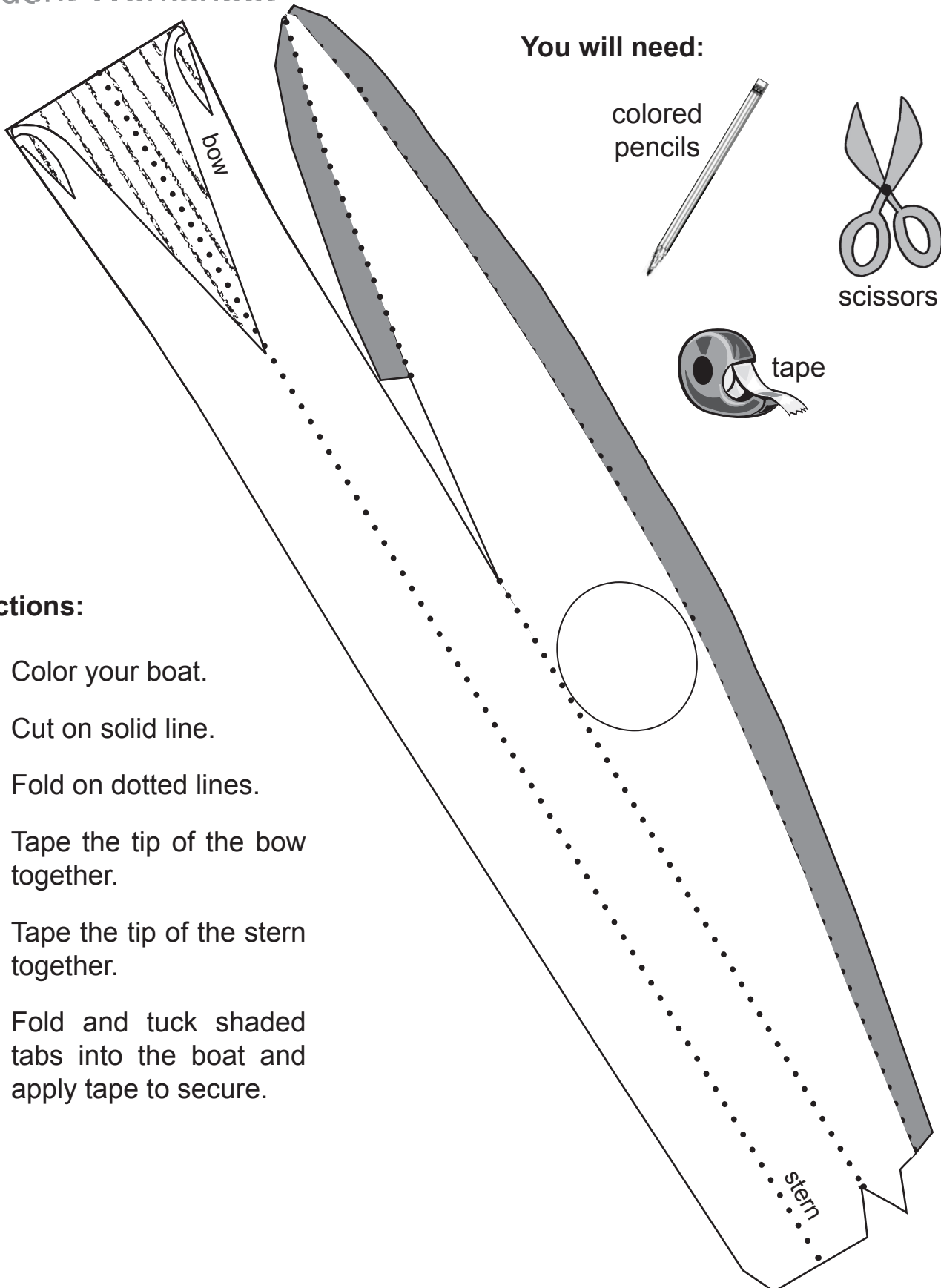
scissors



tape

Directions:

1. Color your boat.
2. Cut on solid line.
3. Fold on dotted lines.
4. Tape the tip of the bow together.
5. Tape the tip of the stern together.
6. Fold and tuck shaded tabs into the boat and apply tape to secure.



Name: _____

Qayaq / Iqyaĥ Journal

Student Worksheet



Draw a picture of a *qayaq* or *iqyaĥ* and write about it.

Name: _____

Qayaq / IqyaĶ Journal

Student Worksheet



1. Draw a picture of a *qayaq* or *iqyaĶ*.

2. What parts of the *qayaq* or *iqyaĶ* help it move well on ocean waves?
