

ANCHORAGE MUSEUM

CULTURAL ARTS 1 & 2: MEASURING & SYMMETRY



Andrew Gronholdt
Hunting Visor

Wood, paint, ocher, stain, sinew, graphite
2013.015.001

Frank Andrew
Kayak Frame

Wood, pigment
2007.026.001



This curriculum was created on Eklutna Dena’ina homeland. It is dedicated to all Indigenous peoples working to share their knowledge and culture, striving for a more inclusive future for western education. This resource addresses how to create and implement culturally-competent arts curriculum that uplifts Indigenous voices and ways of knowing. In the creation of this curriculum, we acknowledge and honor all Elders—past, present, and emerging—for their stewardship of the lands, plants, waters, and animals across Alaska. We thank them for sharing their lifeways, experiences, and cultures with students and the wider community. This curriculum would not be possible without their efforts.

We would like to express our gratitude to Aaron Leggett, John Hagen, and Evelyn Yanez for sharing their time and knowledge to refine this curriculum. Thank you for your guidance and support.

UNIT AT A GLANCE

Investigate measuring techniques and approaches to symmetry used in Alaska Native cultures and develop skills in creating geometric shapes using a culturally specific approach.

Cultural Arts 1: Students will focus on measuring techniques and geometry. Students will view snowshoes and a hunting visor from the Anchorage Museum collection, learn more about ways of measuring from culture bearers in the classroom or through videos, and create body proportionate objects.

Cultural Arts 2: Students will learn about creating shapes from a Yup’ik perspective. Students will view geometric parka trim designs from the Anchorage Museum collection, learn about creating shapes from culture bearers in the classroom or through videos, and create a mosaic.

Note: This unit can stand alone or precede the joinery and bentwood unit.

A NOTE ABOUT CULTURAL APPROPRIATION FOR EDUCATORS

In this unit, students learn about and develop an appreciation for culturally-specific art-making techniques. Cultural appropriation occurs when students replicate culturally-specific techniques or designs from a non-dominant culture. To avoid cultural appropriation, student projects do not use traditional materials or techniques. Instead, students gain inspiration from cultural artwork and practice skills that are not specific to one culture.

Educators are encouraged to invite an Elder or culture bearer into the classroom to share their cultural practices related to this unit. Elders and culture bearers should receive financial compensation for their time and expertise. Consider grants from the Anchorage School District or the Alaska State Council for the Arts to help cover this cost.

If an Elder or culture bearer visits your class, discuss what they will share and how they want students to use this information. In this case, it may be appropriate for students to use traditional materials or techniques (e.g. an Elder provides salmon leather for students or wants students to copy a specific design).

STANDARDS

Alaska Visual Arts Standards:

VA:CR1a&b
VA:CR2a&b

VA:RE7a&b
VA:CN10a

VA:CN11a



Cultural Standards for Students:

- B.1 acquire insights from other cultures without diminishing the integrity of their own
- C.4 enter into and function effectively in a variety of cultural settings
- D.1 acquire in-depth cultural knowledge through active participation and meaningful interaction with Elders
- D.3 interact with Elders in a loving and respectful way that demonstrates an appreciation of their role as culture-bearers and educators in the community
- E.3 demonstrate an understanding of the relationship between world view and the way knowledge is formed and used
- E.4 determine how ideas and concepts from one knowledge system relate to those derived from other knowledge systems
- E.8 identify and appreciate who they are and their place in the world

MATERIALS**Cultural Arts 1:**

- Colored construction paper or felt
- Scissors
- String
- Pens or markers

Cultural Arts 2:

- Large cardstock for backdrop
- Colored construction paper/magazines/newspapers
- Scissors
- Glue
- Pens or markers

KEY TERMS

<i>ikuyek/ikuyagnek/ikusegneq:</i>	Central Alaska Yup'ik units of measurement for the distance from the elbow to the tip of the index finger
<i>yagneq</i>	Central Alaskan Yup'ik unit of measurement for the distance between fingertips of outstretched arms
<i>ell (unit)</i>	an English unit of measurement for the distance from the elbow to the tip of the middle finger
<i>fathom</i>	an English unit of measurement for the distance between fingertips of outstretched arms
<i>elirqun</i>	shape used as a template to cut out other shapes
<i>qupak</i>	Iñupiaq term for geometric patterned parka trim made of fur or cotton
<i>qaspeq</i>	Central Alaskan Yup'ik term for an uninsulated or rain parka
<i>tumartat</i>	Central Alaskan Yup'ik term for putting together pieces to make a whole
<i>cuqute-</i>	Central Alaskan Yup'ik root for measuring
<i>biometric</i>	measurements related to human characteristics
<i>meter (1795 definition):</i>	the distance equal to one ten millionth (1/10,000,000) of the North Pole to the equator running along the meridian through Paris



meter
(2019 definition)

the fixed numerical value of the speed of light in vacuum c to be 299792458 when expressed in the unit ms^{-1} , where the second is defined in terms of the caesium frequency $\Delta\nu_{\text{Cs}}$

A NOTE ABOUT TERMINOLOGY

The Anchorage Museum refrains from using the terms Eskimo, Indian, and Aleut and instead uses language identified by the Alaska Native language groups. Due to these words' complicated history, the Anchorage Museum does not use these terms. However, it is important to note that Indigenous communities and individuals are at different places of healing and self-identity and may use these terms.

The largest Indigenous language family in North America is the Dene language family, which is commonly identified as 'Athabascan'—a word that is not native to any of the Indigenous languages to which it refers. Dene is a word for Indigenous peoples belonging to several cultures whose languages belong to the Dene language family with traditional homelands in Interior Alaska and into Western Canada; the word Dene means 'people' in several Dene languages.

CULTURAL ARTS 1: INTRODUCTION TO BIOMETRIC MEASURING

TIME FRAME

Approximately 40 minutes

MATERIALS

Snowshoes; 1991.027.001ab
Kayak Frame, Frank Andrew of Marshall and Noah Andrew, Sr. and Bill Wilkinson; 2007.026.001
Hunting Visor, Andrew Gronholdt; 2013.015.001

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.



SNOWSHOES; 1991.027.001ab

ASK: *What do you notice about this image?
Describe the materials you see in this image?
How would you use this object?
How do you think this object was made?
What does this remind you of?
What more can you find?*

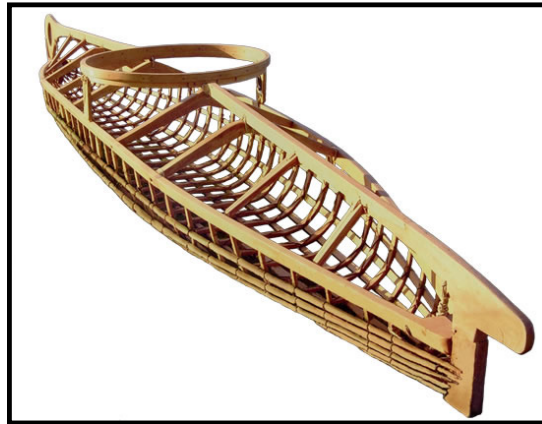
Snowshoes

The basic principle behind snowshoes is to redistribute a person's weight across a wider base, enabling the user to walk through otherwise difficult terrain. By being able to walk on top of snow, a person exerts less energy while traveling and hunting, especially in conditions where snow could be waist-deep.

Qayaq vs. Kayak

In the Inuit-Yup'ik-Unanga languages, 'q' is a sound distinct from 'k' and is made farther back in the throat.

When American and European explorers borrowed this term, they did not differentiate between these two sounds and wrote it as a 'k'.



Kayak Frame, Frank Andrew of Marshall, Noah Andrew, Sr. and Bill Wilkinson; 2007.026.001

ASK: *What details do you notice in this image?
What do you know about possible techniques used to make this object?
What do you notice about the materials in this image?
How would you describe shapes that make up this object?
What does this remind you of?
What more can you find?*

SHARE: *This kayak frame was built by Frank Andrew of Marshall and Noah Andrew, Sr. and Bill Wilkinson in Bethel in 2006-2007 using classic Yup'ik kayak construction techniques. The Anchorage Museum acquired this kayak frame in 2007 for the Yuugnaqpiallerput (The Way We Genuinely Live): Masterworks of Yup'ik Science and Survival exhibition.*



Hunting Visor, Andrew Gronholdt; 2013.015.001

ASK: *What do you notice about this image?
What do you see that tells you about how this object was made?
How might this object have been used?
How would you describe the shape of this object?
What can some of the details tell you?*

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



2. Define measuring and discuss as a class words that we use to describe how we measure. For example, a perimeter denotes the length
[10 min.]

LEARN MORE ABOUT HOW WE MEASURE

HOW WE MEASURE: THE METRIC SYSTEM

Around the world, virtually all cultures have units of measurement corresponding to our anatomy. These biometric measurements are widely available and require no specialized measuring tools. In certain practical applications, people using Imperial, US Customary units, or the metric system sometimes use the width of their thumbs to measure an inch or the width of their little finger to measure a centimeter. Other common methods of biometric measurement in the west include counting the distance between a person's feet when at a full stride to measure a meter or a yard.

For scientists and mathematicians in Europe looking to share written information with one another, problems arose as different measuring standards meant having to constantly convert units of measurement. Toward the end of the 16th century, European scientists suggested using physical constants and ratios as a means of measuring. In 1790, a French panel of scientists defined the first units of measurement that would become the metric system. Beginning in the 19th century, various governments began to implement the metric system, and later the International System of Units in the 20th century.

The International System of Units is not static. It has changed and continues to do so to meet the needs of the scientific community, whereas the metric system is the practical measuring system now encompassing the International System of Units and other units such as the hour, liter, and degrees centigrade. In 2019, four of the seven units of measurement in the International System of Units were redefined according to stricter scientific constants. The new differences are negligible for daily measuring but improve the accuracy of scientific measurements in experiments.

WATCH:

Ted-Ed - [Who decides how long a second is? - John Kitching](#)

Ted-Ed - [What's the difference between accuracy and precision? - Matt Anticole](#)

Veritasium - [The kg is dead, long live the kg](#)

Vox - [Why America still uses Fahrenheit](#)

READ:

National Institute of Standards and Technology - [Definitions of SI Base Units](#)

Basement Guides - [The History of Measurement](#)

Minitab - [Accuracy vs. Precision: What's the Difference?](#)

ADDITIONAL READING:

Andrews, Frank, and Ann Fienup-Riordan. [Paitarkiutenka - My Legacy to You](#). Seattle: University of Washington Press, 2008.

Gronholdt, Andrew, Michael Livingston, and Sharon Gronholdt-Dye. [Chagudax: A Small Window into the Life of an Aleut Bentwood Hat Carver](#). San Francisco, USA:

CULTURAL ARTS 1: INTRODUCTION TO MEASURING

TIME FRAME

Approximately 40-45 minutes

MATERIALS

Various flat objects with a flat surface such as paper, felt, books, tables

DIRECTIONS

1. Discuss with students what we might do to measure objects without the use of a specific measuring tool. Prompt students by asking them what we use to record, mark, and refer to measurements.

[5 min.]



2. Discuss with students how using body measurements can be a practical method of measuring.

[5 min.]

3. Engage with students on how different parts of the body can be used practically for measuring.

[5 min.]

4. Pass out various flat objects and Invite students to measure and records using different units of measure derived from the body (distance between fingers, palms, feet, or whatever students decide to use).

[15 min.]

5. Discuss as a class using biometric measurements. What was useful? What may have been confusing?

[10 min.]

LEARN MORE ABOUT HOW WE MEASURE

BIOMETRIC MEASUREMENTS IN KAYAKS

Standardized units are beneficial in many ways, but biometric measurements have unique advantages. Since biometric measurements come from the individual, the final product is proportional to its measurer, guaranteeing a better fit in almost all cases. This is most evident in items like clothing in which tailored garments almost always fit better than something available in a standard size.

In Yup'ik, Iñupiaq, Siberian Yupik, Sugpiaq, Dena'ina, Eyak, and Unangaꝯ cultures, individuals often build personal kayaks according to biometric measurements. The personalized dimensions let the user move optimally in the water. The maneuverability of personalized kayaks lets riders navigate difficult weather conditions, conduct complex movements such as kayak rolls, and hunt effectively as the kayaks function as an extension of the rider's body. Kayaks with two to three hatches also exist, but primarily are built for stability instead of speed. Notably, the shape and construction of kayaks depend on the types of water environments that it would be on, as well as cultural preferences. For example, the vast majority of Unangaꝯ kayaks are relatively sleeker and faster than the flatter bottom designs of some Yup'ik kayaks which are built for stability and stealth instead of speed.

Like the components of a kayak frame, the length of its paddle also comes from the user's body measurements. A typical measurement for the length of a paddle is the armspan of its user. Paddle blade measurement varies depending on whether the paddle blade is supposed to be wide or narrow.

CULTURAL ARTS 1: ACCESSORIES

TIME FRAME Approximately 90 minutes

MATERIALS Paper
Felt
Scissors
Glue
Pencil or marker

[Math in a Cultural Context - Making a Square](#)

DIRECTIONS 1. Watch **[Math in a Cultural Context - Making a Square](#)** and discuss the techniques used in the video to measure a square.

[30 min.]



2. Invite students to trace the outline of their hand three times: one with their fingers close together, one with fingers spread out, and one in a fist. Make sure there is enough distance between each tracing to cut out.

[5 min.]

3. Invite students to cut out these hand tracings and create subdivisions for each one if they find it useful.

[5 min.]

4. Invite students to measure their wrists or the circumference of their head using the hand cutouts and to record their measurements in terms of those measurements.

[5 min.]

5. As a class, discuss the experience of measuring using their hand cutouts and how else they might be able to measure curved objects.

[5 min.]

6. Pass out string, felt, or paper. Invite students to apply the biometric measurements they took of their wrist/head and cut the bracelets or headbands to the correct length.

[10 min.]

7. Invite students to decorate their bracelets or headbands by drawing and gluing designs that are meaningful to them.

[15 min.]

8. Invite students to share their bracelets or headbands and discuss what they have learned throughout the unit.

[10 -15 min.]

ASSESSMENT

Students will be assessed based on participation in class discussion and practice with the Elder or culture bearer, completion of artwork, and artwork presentation to the class.

CULTURAL ARTS 2: INTRODUCTION TO PATTERNS

TIME FRAME

Approximately 60 minutes

MATERIALS

Parka Trim, Della Nicholai, 1971.097.018ac
Parka Trim, Margaret Temple, 1977.046..002
Parka, Pauline Harvey, 1971.122.001
Parka, Esther Agibinik, 1972.041.001

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.



Parka Trim, Della Nicholai, 1971.097.018ac

*ASK: What do you first notice about this object?
What are some words to describe this object?
How does this object make you feel?
What forms or shapes do you notice?
How do you think this object was made?
What else can you see?*



Parka Trim, Margaret Temple, 1977.046.002

*ASK: What do you first notice about the object?
What does it look like this object is made of?
How might this object been made?
What does this object make you think of?
What else can you see?*



Parka, Pauline Harvey, 1971.122.001

*ASK: What do you first notice about the object?
What are some shapes that you see?
What might this object be used for?
How does this object make you feel?
What forms or shapes do you notice?
What else can you see?*



Parka, Esther Agibinik, 1972.041.001

*ASK: What do you first notice about the object?
What are some shapes that you see?
What might this object be used for?
How does this object make you feel?
What forms or shapes do you notice?
What else can you see?*

Yup'ik Parka Trim Designs

Classic Yup'ik parka trim designs were made to seamlessly connect, giving a visual effect of continuity.

Patterns often consist of repeating light and dark shapes laid out side by side. All patterns also have at least a vertical line of symmetry.

In cutting out shapes, the person making a parka has to be conscious of which way the fur on the pieces points, otherwise water may get caught and prevent the user from being dry.



2. Discuss as a class: what stood out to you about the colors of patterns you liked? What shapes were included in the pattern designs you found most appealing? What patterns featured on your clothing, fabric, and other materials do you find most appealing?

[15-20 min.]

LEARN MORE ABOUT YUP'IK GEOMETRIC PATTERNS

YUP'IK GEOMETRIC PATTERNS

For an individual to create geometric patterns on clothing like a qaspeq or taking measurements for clothing, symmetry is the basis for precision. Though each Alaska Native culture has its own set of varying biometric units of measurement, certain geometrical concepts remain constant. For example, in creating a square, a straight line from the center point is the same to all corners. By folding along a line of symmetry to match diagonally opposite corners, a person can verify whether a square is has perfect angles and aligned edges. Folds also ensure straight edges and help establish center points from which to create polygons.

In measuring for two people, the difference between their measurements may be used as the basis for measure. As the difference is used as the basis for measurement, any measurements made with it is proportional to both people, no matter what unit of measurement a person uses to define it.

CULTURAL ARTS 2: INTRODUCTION TO SHAPES

TIME FRAME Approximately 3-5 class sessions

MATERIALS Paper
Newspaper and/or magazines
Pencil or pen
Scissors

[Math in a Cultural Context - Making a Square](#)

[Math in a Cultural Context - Making a Square: Math Concepts Part 1](#)

[Math in a Cultural Context - Making a Square: Math Concepts Part 2](#)

[Math in a Cultural Context - Making the Third: Part 1](#)

[Math in a Cultural Context - Making the Third: Part 2](#)

[Math in a Cultural Context - Making a Circle from a Square: Using the Four Winds](#)

[Math in a Cultural Context - Circle to Square](#)

[Math in a Cultural Context - Scaling: Math Concepts Part 1](#)

[Math in a Cultural Context - Scaling: Math Concepts Part 2](#)

DIRECTIONS 1. Invite an Elder or culture bearer into the classroom to talk about and demonstrate basic techniques for cutting out different shapes in different sizes. Encourage students to observe closely and practice the techniques.

Or, if unable to host an Elder or culture bearer:

Over a series of class periods, watch 2-3 videos with students and attempt to replicate the techniques in the videos.

[variable.]

2. If able, ask the Elder or culture bearer to talk about and demonstrate how to derive other shapes such as kites or parallelograms.

[20 - 30 min.]

3. Invite students to comment on the process of creating shapes this way and discuss why it would be important to carefully check your work when working



with materials such as fur.

[20 min.]

4. Once students are comfortable creating shapes, invite them to use shapes they liked as a template to create duplicates.

[10 min.]

ASSESSMENT

Students will be assessed based on participation in class discussion and practice with the Elder or culture bearer, completion of artwork, and artwork presentation to the class.

CULTURAL ARTS 2: ME MOSAIC

TIME FRAME Approximately 2 -3 class sessions

MATERIALS Colored construction paper
Newspapers and/or magazines
Scissors
Glue
Pencil or pen

A NOTE ABOUT CULTURAL APPROPRIATION AND THIS ACTIVITY

Students will learn about Yup'ik geometric techniques and develop an appreciation for these methods. Students will not create Yup'ik patterns in their project because it is culturally appropriative to replicate these culturally-specific patterns without consulting an Elder or culture bearer. These are the same reasons students are using paper, rather than fur, for their projects. Instead, students will learn and use materials that are not from a specific culture.

If an Elder or culture bearer visits your class, discuss what they will share and how they want students to use this information. In this case, it may be appropriate for students to use fur /hide and/or incorporate Yup'ik patterns into their project.

DIRECTIONS

1. Invite students to create one to three shapes (squares, rectangles, circles) as templates using the methods from Cultural Arts 2: Introduction To Shapes.

[20 min.]

2. After creating the general shapes, invite students to create an outline of themselves, their hand or foot, or an outline of something with personal meaning on a sheet of construction paper.

[5-10 min.]

3. Using the shapes created earlier, invite students to trace copies of their original shapes on various types of paper and cut out pieces to glue onto the outline as well as to fill it out. Encourage students to use experiment with contrasting shapes and colors.

[45-90 min.]

4. While cutting and gluing, discuss with students their thought processes as they plan to create their mosaics. Invite students to share practices with one another as they work.

5. Invite students to present their work and discuss what they learned in the process of creating as well as challenges they faced.

[45 min.]



ASSESSMENT

Students will be assessed based on participation in class discussion and practice with the Elder or culture bearer, completion of artwork, and artwork presentation to the class.

EXTENSION ACTIVITY: BODY SCHEMATICS

NOTE: This activity may be used by itself, or may be used as the first of three activities.

TIME FRAME Approximately 65 minutes

MATERIALS Colored construction paper
Black marker, pen or pencil
Long straightedge
String

DIRECTIONS

1. In groups, invite students to design a blueprint for a sculpture of a creature, real or imaginary using biometric measurements as a basis for the skeleton. Encourage students to consider areas of muscle, skin, and bone in real life for inspiration.

[30 min.]

2. Prompt students to measure by marking the ends of a unit such as an arm, connecting the endpoints with a straightedge. and labeling it.

[35 min.]

3. If continuing with the next extension activity, remind students that these blueprints will be built and that students should scale their drawings for what they intend to build.

ASSESSMENT

Students will be assessed based on participation in class discussion and practice with the Elder or culture bearer, completion of artwork, and artwork presentation to the class.

