Math/VA/CTE 10 Traditional Drum Constr. & Care *R

6 Curriculum Developers

Unit Description

Type Author Name: **Fannie Akpik**, Pamella Simpson, and Pat Partnow
Also materials from Arth Brown and Steve Culbertson.

Men and women folk can learn how to make a traditional **drum**. A drummer who takes very good care of a **drum** with respect makes our Mother Eagle legend alive again with ancient songs and dances passed down from generation to generation. Always listen to and adhere to lead drummers and singers for their traditional ways of being a member of their dance groups. Leaders know when a young man/woman is ready to sit next to him/her and teach him/her how to hold onto, where to beat the **drum** and how to use the wrist to make the **drum** meet the **drum** stick for a rich, hollow sound. Have fun learning to hear and keep Mother Eagle's heartbeat strong respectfully. Kuutuuq Piquk, 2018

Traditional Drum Construction and Care Course Description:
The art of making a traditional **drum** and how to use the **drum** will be taught in this class. Local expert/s will share their knowledge of how a **drum** is made and how to care for **drum** to last.

What will students know and be able to do?

ILF Performance Expectations

ILF: Performance Expectations: Community Realm

Novice

Singing and Dancing

Singing and dancing: language C.sd.1
The student demonstrates an understanding of the relationship between singing and dancing and the Iñupiaq language by . . .

- [N] C.sd.1.1 Producing the rhythm, and singing a repertoire of songs, solo and in unison.

Arts

Arts and Spirituality C.a.2
The student uses knowledge of traditional Iñupiaq culture to . . .

- [N] C.a.2.1 Examine traditional Iñupiaq tools and describe the artisanship and artistry involved in their design and production.

All people should engage in the arts C.a.4
The student engages in the arts by . . .

- [N] C.a.4.2 Creating a rubric that describes a good work of art; making an object and critiquing it using the rubric.

Practitioner

Singing and Dancing

Singing and dancing: Spirituality C.sd.2
The student uses knowledge of traditional Iñupiaq culture to . . .

- [P] C.sd.2.3 Place him/herself in the appropriate mind-set and show proper attitude toward drumming and dancing.

Singing and dancing as expressions C.sd.3
The student demonstrates a knowledge of singing and dancing by . . .

- [P] C.sd.3.1 Explaining the protocols associated with songs, and the difference between various types of songs.
- [P] C.sd.3.2 Exploring why singers and performers sing, drum and dance.

Standards

AK: Cultural Standards (2016)

AK: All

Students

A. Culturally-knowledgeable students are well grounded in the cultural heritage and traditions of their community.

- 3. acquire and pass on the traditions of their community through oral and written history;

AK: Mathematics (2012)

AK: HS: Geometry

Congruence

G - CO Make geometric constructions.

- G-CO.12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.

Geometric Measurement and Dimension

G - GMD Explain volume formulas and use them to solve problems.

- G-GMD.1. Explain how to find the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.

AK: CS: Arts (2006)

AK: K-12

Arts

A. A student should be able to create and perform in the arts.

- 3. appropriately use new and traditional materials, tools, techniques, and processes in the arts;
- 5. collaborate with others to create and perform works of art;

B. A student should be able to understand the historical and contemporary role of the arts in Alaska, the nation, and the world.

- 3. recognize the role of tradition and ritual in the arts;

C. A student should be able to critique the student's art and the art of others.

- 5. exhibit appropriate audience skills; and

Essential Questions

OU: People use ceremonies, song and dance to commemorate important events, to connect and celebrate the unity of the group, and to bring joy and fun into their lives.
EQ: Why do the Iñupiat gather periodically for special ceremonies and celebrations?
EQ: How do singing, drumming, and dancing contribute to our spiritual, emotional, social, and physical well-being?
EQ: Why do people sing and dance?
EQ: How are the arts integrated into all aspects of Iñupiaq life?
EQ: Why do people produce art? (i.e., song, dance, drumming, etc.)

OU: Culture is embedded in language; different languages uniquely express cultural understandings and beliefs.
EQ: How is the language of song and dance different from the language of speech?

OU: Math is used to produce historical and modern tools (harpoon, snowmachine, ruler, calculator, etc) for everyday life.
EQ: What role does mathematics play in your world from the past, present and in the future?

Knowledge

Student will know...

- the importance of oral tradition in keeping cultures alive.
- Iñupiaq vocabulary that relates to Iñupiaq song and dance.
- The English vocabulary that relates to Iñupiaq song and dance.
- the role of community celebrations in maintaining solidarity and belonging.
- stories are told through motion dances.
- girls have different dance moves than boys.
- there are meanings for different motions.
- drums make a beat and have rhythm.
- the beat and timing for each song and dance.
- we can make rhythm using our bodies.
- balance plays a role when dancing.

Skills

Students will be able to...

- put together steaming equipment.
- choose the proper wood (both size and type of wood) for a drum frame and drumming stick.
- steam their drum frames for the correct amount of time.
- take out and bend hardwood onto a round frame and clamp it together.
- put a coupling to hold hardwood together.
- carve a groove on the edge of drum for tying membrane/material to frame.
- stretch and tie down the membrane/material to the drum frame.
- make and keep their drums safe until next use.
- teach others new dance motions.
- the the meaning of the Iñupiaq singing while dancing.
- learn new songs and motions.
- participate in a classroom performance.

- coordinate hand and leg movements to the rhythm of the beat.

How will we teach?

Lessons

Teacher Prep Directions:
It would be a nice as a preview to this activity to reread *Eagle **Drums*** by Nuasuġraq Rainey Hopson, which these students would have read in 8th grade.

See the DVD below labeled,Fred Nukapigak - Traditional **Drum** Making. This DVD has 4 sections:

- Section 1-20 minutes Steaming and bending strip of wood onto a steel **drum** barrel with clamps and Iñupiaq bow drill demonstration;
- Section 2 - 26 minutes Putting hoop together with wooden pegs, using anIñupiaq bow drill to drill holes for the wooden pegs, and attaching a piece of asheep's horn;
- Section 3 - 32 minutes Putting on the "rip stop" fabric with twine then cutting off the excess fabric;
- Section 4 - 29 minutes Fred Nukapigak practicing **drumming** and singing with the students).

This can be done in a week's time. However, it may take longer due to the length of class schedules vary from school to school site in NSBSD.

Traditional Procedures for making a drum

- Students learn how steaming equipment is made and put together for steaming hardwood. then they:

- measure and cut hardwood to the size of a **drum**,
- steam the hardwood, and
- then using the round frame, bend and clamp steamed hardwood.
- hollow a groove on the edge of the hardwood to tie down the membrane or suitable material.
- after bending and drying the hardwoods, measure and drill holes to attach the coupling to hold the bended wood together.
- shape and attach a handle on to the **drum** where coupling was attached.
- using traditional membrane from an animal, soak and clean the membrane, split membrane if need be and measure for size before the membrane is stretched and tied down on the frame.
- make drumsticks from hardwood for beating the **drum**,

Traditional Procedures for learning to use the drum

- Students will learn how to beat the **drum** the right way.
- Students will learn the importance of caring for the **drums** as they make a storage box for them individually or as a box to carry together.
- the importance of handling a traditional **drum** with respect.

Vocabulary:

1. Imik- = to resound, reverberate well; be stereophonic; to have a rich hollow sound, (of a **drum**)
2. Imiksi - = to make (it) better sounding (of a **drum**)
3. Isi = **drum** skin
4. Isik/isiaq = t) to stretch a skin over it = **drum**
5. Isiksraq = skin for **drum**
6. Kasaun = **drum** stick used for beating on **drum**
7. Kitigaġvik- = groove around outside of **drum** frame where string is strung to attach the drumskin
8. Kitigaq- = string which holds drumstick to frame; to attach it=drumstick to its frame with string
9. Qiḷaun = **drum** used in Iñupiaq dancing | :un^{1}*vn*
10. Qiḷaurraq- (*i*) = to **drum**, play the **drum** | -urraq(-) *vv*,*vn*
11. Qiḷausiraq- (*Ti*) (*i*)=to play the **drum** | :uti^{1}*vn* =Iraq- *nv*
12. Qiḷausiraqti = *or* qiḷaurraqti drummer | :uti^{1}*vn* =Iraq- *nv* t/ri *vn* -urraq(-) *vv*,*vnt*/ri *vn*
13. Sigguktaak/ =sigguktaq/qakigḷuk Iñupiaq dance headdress with loon's bill | +**taq***nn* **'-k** (*dual mkr*)

CTE Drum Making
Pre-Assessment:

Use any worksheet, lesson questions, or handout you have available to measure the student's knowledge of radius, diameter, and the calculation of circumference and area.

Pre-assessment - **See Link Below**

1. Finding Pi (1 lesson)

Use this lesson to identify and teach the value of pi. (Estimating_Practice.docx & Finding Pi Website & CTE_UbD_Math_Pre_Assessent_.docx) If pre-assessment shows students already know the value AND how pi applies to circles, then skip this lesson.

Have 6+ circular objects for students to measure. They are to measure the circumference and the diameter and then calculate the value of pi. The completed table will demonstrate that no matter how big the object is, pi is a constant.

Use the handout and guide the students to physically roll the cylinder/circle, measuring the circumference. Then measure the diameter showing the students how to make sure they are measuring at the farthest point across a circle. Record the data in the handout table. Calculate. Reinforce the vocab and equation at the bottom of the handout.

DOK 3

You can use the attached website in resources as a guide.
Finding Pi Exercise - **See Link Below**

2. Concept and Skill Practice: (1-4 Lessons depending on concept retention)

Using the math curriculum at your site (Saxon/Holt/Carnegie/site choice or Free Math Worksheets), emphasize and teach the vocab and skills needed to calculate circumference and area. Teach the skills and then practice, practice, practice.

In resources, there is a linked free math website; there are Saxon resources attached; and there are thousands of free math help aids online.

DOK 1 & 2

****The following learning experiences are like a choose-your-own-adventure story. Please read through the experiences and choose which best applies to your class environment.**
**CTE Portion
The building of a flat drum.
Before beginning to build at flat **drum** there are things that need to be considered. This will require the use of a variety of dangerous tool, and no one should work with this equipment without having been properly trained how to properly and safely use them.
In these instructions I will be referring to two documents, doc 1 is the "making a **drum** frame" doc 2 is "covering a **drum**" both of these documents are attached to this unit, and they have pictures that may help show you what I am trying to explain.
Building the frame of the drum. (Visual Making_a_drum_frame (1).pdf)
1. **Choosing the wood:** The first step to building your flat **drum** will be to choose a type of wood. This process needs to be considered because not all wood can be used to build a flat **drum**. You should use a hard wood; examples of this kind of wood are Oak, Maple, Birch, and Hickory. When choosing your wood it needs to be free of any knots, and cracks. If your wood has knots and cracks it will most likely split or break when you try to bend it into a round shape.
2. **Choosing the size of the drum and wood:** After you have chosen you type of wood and you have made sure it is free of defects you need to take size into account, you should try to find some pieces that are one to two inches thick and long enough to make the **drum** the size you want, (for a **drum** that is about 20 inches in diameter, it will need to be about 5 1/2 feet long) the reason for this is to minimize the amount of cutting on the table saw and trying to cut very thin or small pieces of wood on the table saw can be dangerous.
3. **Cutting and ripping the wood:** So we now have our wood, if you have chosen a piece as described above, the process will be as follows (If not you will have to adjust the instruction to fit your size). First cut the board to the desired length on the miter saw about 5 ½ feet long. Second you need to rip cut the large piece into smaller strips, so that they can be bent into a round shape, the thicker you cut them the harder it will be to bend them without cracking and breaking. If they are cut too thin they wont hold up very long, and it may be difficult to stretch the material tight enough without breaking it. Set your table saw up to cut the wood into strips 3/16 to ¼ of and inch thick, using the fence to make sure they are the same thickness all the way through. (See doc 1)
4. **Putting a groove in:** The next step will be to put a groove into the wood strips. This is done using a router and router table. Set up the table so that when you run the strip over the router bit (set up with a strait router bit, the size of the bit and the depth of the cut will depend on how thick your nylon string is) most will need a 1/8 inch strait router bit, and it will need to be about 1/8 inch deep. The groove needs to be placed in the middle of the strip and run the entire length of the strip.
5. **Softening the wood for bending:** The next step will be to soften the wood up enough to bend it around the 55-gallon **drum**. This is done using hot water and steam to make the wood more flexible. You will need a cylinder of some type with a sealed end and an end that you can open and close. The cap needs to be tight enough to hold the strips in, but loose enough or have holes in it to release steam. (See doc 1) you will add your strips of wood into the cylinder and then fill it with enough water that all of your wood is covered (Hot water works best to get the process started). The wood strips will want to float, so you will have to make sure there is enough water to cover them completely. Then put your cap on and heat the water with a torch or some other heat source, enough to bring the water to a boil once that happens remove the heat and you can let it sit until the strips no longer float. (**Again you MUST have a way for the pressure to escape or you will have created a bomb**) When the strips no longer float they are ready to be bent, this usually takes a day or two. Before you take them out to be bent, reheat the water to a boil again this will make the bending process easier and you will have better chance of not breaking them when bending them. (See doc 1)
6. **Bending the wood:** When the strips no long float and they are still hot from the water bath it is time to bend them around the 55-gallon **drum** to get the circular shape we want for the **drum**. This will take two or three people. You will need the parallel wood clamps for this. Clamp the end of the strip you are bending to the **drum** and as you are bending the strip around the **drum** place another clamp every 1-2 feet as you go around the **drum** making sure you clamp both ends of the strip down to the **drum** securely. The strip needs to be tight against the **drum** or your strip will not be very round. (See doc 1) when the strips are completely dry you can remove them from the 55-gallon **drum**. This will take 1-2 days depending on the humidity and temperature of where you are doing this. While these are drying you can be making your handle see the handle-making document for those directions. (Making_the_handle_to_a_**drum**.docx)
7. **Attach the handle to the ring:** See handle making instruction.
This concludes the frame building part of the project.
Covering the frame of the drum. (Visual Covering_a_drum[3]_copy.pdf)
8. **Cutting out the rip stop fabric.** To cover the frame you will need some traditional skins, or in place of traditional skins you can use rip stop fabric. When cutting out the fabric you need to make sure that it is large enough to cover the entire top surface of the **drum** and that you have 3-4 inches more than that to hold onto for the stretching part. So if you have a 20-inch diameter **drum** you would cut a piece that is 24-25 inches round.
9. **Wetting the fabric:** After you have cut your piece of fabric you need to get it wet, using a container of water soak the fabric completely submerged for 1-2 minuets. When you are sure that the fabric is completely wet, you will remove it from the water and wring it out and flip it a couple of times to remove any excess water. (See doc 2 pic 2)
10. **Securing the fabric to the drum frame:**when your fabric is still wet but not dripping, lay it over the top of your **drum** frame. You need to have your nylon string there and when cutting the string always use a lighter to do so, to keep the string from unraveling. You will tie a secure non-slip knot into one end of the string creating a loop. (See doc 2 pic 4) the string needs to be able to wrap the diameter of the **drum** frame 6-7 times so measure out the string and cut it again using the lighter. Center you fabric as best you can then take the none- knotted end of the string and put it thought the loop creating a larger loop. (See doc 2 pic 6) You also need to tie a piece of twine to the small loop you made so that you can pull it out from under the twine you are wrapping around the frame. Put your larger loop around the frame and the fabric and tighten the twine down make sure it is in the groove. (See doc 2 pic 7) You will need to pull the small loop out each time you go around the frame and you will use this smaller loop to tighten up and secure your twine to the frame. The twine needs to fill the groove you have made in the frame.
11. **Tightening the rip stop fabric:** As you are wrapping the twine around the frame you must keep it tight and it needs to be down in to groove. The other person will be pulling the fabric getting all of the waves and any wrinkles out of it, this is a tough job and if you aren't grunting your not doing it correctly. (See doc 2 pic 9) there is also the problem of the twine coming out of the groove when you are pulling the rip stop fabric tight. So each time you tighten the fabric check the entire groove to make sure the twine is staying in the groove. And remember to pull the small loop you made at the first out each time you complete one wrapping of the frame, you will need this loop later to tie off the twine. The person pulling the twine should wear a glove, to keep from getting burned from pulling the twine so tightly.
12. **Tying off the twine:** when the groove is filled with the twine, and the fabric is free of any wrinkles, and is tight, it is time to tie off the twine. Using the small loop you made in the twine and have been pulling out each time you go around the frame, pull the end of the twine through the loop and tie it off with a couple of overhand knots, again this

part is a two person job, one of you need to hold the twine tight while the other is tying off the knots. You don't want to loose all of your hard work of getting everything tight by letting the twine slacken up. Use a lighter to cut the twine off and cut the piece of twine that you used to pull the loop out from under each wrapping. (See doc 2 pic 15)
13. Cutting the excess fabric from the drum: when you have everything tied off and secure then you can cut off the extra fabric from the **drum**, cut it off at the bottom of the **drum** frame. (See doc 2 pic 18)
14. Spraying the drum with polyurethane: After the **drum** has dried, hang it in a well ventilated area. Spray the top and bottom area of the fabric. Make sure that you wipe off any extra polyurethane with paper towels that may be dripping. Once you have done that you will need to spray the inside of the wood and the handle of the **drum**, make sure you put a generous amount on the twine in the groove, this will help to "lock" it in place, and keep it from getting loose as you use the **drum**. Wipe off any dripping polyurethane and let dry. Once dry you can use your **drum**.

- Motion_Dance_Rubric (1).pdf
- P2M2T2_Inupiaq_motions_.pdf
- Photo_Inupiaq_Dance.pdf
- Pre_and_Post_Assessment_Inupiaq_Motion_Dancing.pdf
- Photo_Eskimo_Drumming.pdf
- Goose/Eagle Dance L.Pikok dancer Neakok drummer
- CTE_UbD_Math_Pre_Assessent_.docx
- Making_the_handle_to_a_drum.docx
- Visual Covering_a_drum[3]_copy.pdf
- Safari Montage Drum Making by Fred Nukapigak & Fannie Akpik
- Visual Making_a_drum_frame (1).pdf
- Finding Pi Website
- Free Math Worksheets
- Amazon Steam Generator
- UAF Native Drum Making Lesson Plans
- Visual Cutting wood pieces needed .docx
- Syllabus 2018 Traditional Drum.docx

Resources and Preparation Materials

Book
*Eagle **Drums*** by Nuasuġraq Rainey Hopson

DVD
Fred Nukapigak - Traditional **Drum** Making (4 sections: Section 1-20 minutes Steaming and bending strip of wood onto a steel **drum** barrel with clamps and Iñupiaq bow drill demonstration; Section 2 - 26 minutes Putting hoop together with wooden pegs, using anIñupiaq bow drill to drill holes for the wooden pegs, and attaching a piece of a sheep's horn; Section 3 - 32 minutes Putting on the "rip stop" fabric with twine then cutting off the excess fabric; Section 4 - 29 minutes Fred Nukapigak practicing **drumming** and singing with the students.

Material List for Traditional Drum Construction

1. Open steel **drum**, 25/55-gallo
2. Wood clamps
3. Heavy duty gloves
4. Carving tools for making handle
5. Band saw to cut hard wood, 5/7 ft.
6. Handle: Antler, ivory or wood (Make the handle with what's available)
7. Steam box (custom made to fit the bucket/Pot that will be used to boil water to steam the hardwood, making it pliable)
8. Galvanized Pipes or wood
9. Dowels to fit the coupling
10. Gorilla glue
11. String to tie down the membrane to **drum**
12. Electrical tape for the ends of **drum** sticks

Drum Making
Materials:

Pre-assessment (see links below)
Math Lesson Materials (see links below)
Intervention, Practice, & Supportive math practice worksheets and sites (see links below)
Supporting websites such as using the body for measurement & Inuit drum making (see links below)

Material List for Traditional Drum Construction

1. Open steel **drum**, 25/55-gallon
2. Wood clamps
3. Heavy duty gloves
4. Carving tools for making handles
5. Band saw to cut hard wood, 5/7 ft.
6. Handle: Antler, ivory or wood (Make the handle with what's available)
7. Steam box with galvanized pipes (custom made to fit the bucket/Pot that will be used to boil water to steam the hardwood, making it pliable) (very safe to use - see Amazon link below) (See drum%20making">Safari Montage Drum Making by Fred Nukapigak & Fannie Akpik to see how to make a traditional steamer box)
8. Dowels to fit the coupling
9. Gorilla glue
10. String to tie down the membrane to **drum** (100 yards nylon twine)
11. Electrical tape for the ends of **drum** sticks
12. Wood (oak, hickory, maple or other hardwood)
13. 10 yards rip-stop nylon or animal membrane
14. Polyeurethane
15. 10 wooden/caribou antlers/ivory handles
16. Drill
17. Wooden pegs to attach handle

Additional Resources Below:
The Dance Festivals of the Alaskan Eskimo
Iñupiaq Values Posters

The Dance Festivals of the Alaskan Eskimo

Iñupiaq Values Posters

How will we assess?

Transfer Task(s) (Performance Assessments)

At least one assessment in GRASPS form.

Iñupiaq Drum and Song/Dance Performance
Summative: Performance (GRASPS)
GRASPS Task
Goal:
Students in groups of 3 or 4 will make an Iñupiaq Drum by following the step by step directions and use the DVD as a resource listed in the resource materials section below.
Role:
Students will be carrying on the Iñupiaq traditions by learning how a traditional Iñupiaq Drum is made and used.
Audience:
Parents, teachers, and peers. Community members may be invited also.
Situation:
The Iñupiaq Song and Dance performance can be at a parent conference or some other school event.
Performance or Product:
After the class has completed making their Iñupiaq Drums, they will perform an Iñupiaq Song and Dance that they have been practicing/learning. (See additional attachments below that can help with the Dance performance.)

Use:
attachments here below
to assess product and performance.
Iñupiaq_Dancing_Performance_Rubric_#2.docx
Drum_product & use_Rubric.docx

Iñupiaq Dancing Performance Rubric #2.docx

Visual Cutting wood pieces needed .docx

Visual Making_a_drum_frame (1).pdf

Visual Covering_a_drum[3]_copy.pdf

The_building_of_a_drum.docx

Making_the_handle_to_a_drum.docx

Drum_product & use_Rubric.docx

Evaluation Tools

- Iñupiaq Drum and Song/Dance Performance Rubric attached above
- Drum product Rubric attached above.

CTE_Expectations_Rubric.docx

Drum_product & use_Rubric.docx

Evidence (Graded)

- Homework/In-Class Practice - See Links Below

Estimating_Practice.docx

circle_area_cal.pdf

Checking for Understanding (Ungraded)

In addition to the pre-assessment, a quick Q&A on the key terms to be introduced.

1. Informal observation - visually check to make sure students are marking and measuring the correct circumference and diameter.

2. Use of classroom skills assessment like practice on individual whiteboards, popcorn review of classwork problems, or partnered quizzing.

3. CTE - use of constant monitoring and redirection of student work in the shop space.