Elder Quote/Belief:
"Cloud streaks high in the sky means it's windy and it is going to be windy." -Mary Malchoff, Port Graham

Grade Level: PreK-2

Overview:
The Elders have shared their traditional ecological knowledge for predicting weather based on keen observation of cloud formations and movement.

Standards:

AK Cultural:	AK Content Science:	CRCC:
D1 – Culturally knowledgeable students are able to engage effectively in learning activities that are based on traditional ways of knowing and learning.	**B4** - Concepts of physical science. A student should understand and be able to apply the concepts, models, theories, universal principals and the facts that explain the physical world.	Survival **S7** Students should be able to learn/observe the weather and tides.

Lesson Goal:
Students will be able to identify the different cloud formations and explain how each was used to traditionally predict the weather.

Lesson Objective(s):
Students will:
- Learn three Sugt'stun/ Eyak vocabulary words
- Observe cloud formations and what each indicated for weather forecast.
- Gather items outside to create a collage of what weather type they observed.

Vocabulary Words: Sugt'stun Dialects

English:	Prince William Sound:	Lower Cook Inlet:	Eyak:
Cloud observation		Llat'surtet or Llaciurtet	
Clouds	Amirluq	Amirluq	q'ahs
Cloudy, overcast		Taluluku	

Materials/Resources Needed:
- Construction paper
- Colored pencils, markers, crayons

- Elmer's glue
- Cotton balls
- Ziploc baggies
- Found objects from outside: grass, moss, twigs, gravel

Books/Documents:
- *The Chugach Eskimo*, Weather Lore, page 115.
- *Project learning Tree, Environmental Education Activity Guide,* Water Wonders Systems, P. 143
- *Alaska Native Science, A Curriculum Guide* by Dolly Garza, pp. 104-105
- *Ellavut Our Yupik World & Weather*
- Clouds Out My Window https://www.weather.gov/media/owlie/CloudsOutMyWindow.pdf

Websites:
- Types of Clouds https://www.youtube.com/watch?v=yod3wMbFHUY
- Using Clouds to Predict Weather https://thehomeschoolscientist.com/using-clouds-to-predict-the-weather/
- Predicting Weather with Clouds http://www.instructables.com/id/Predicting-Weather-with-Clouds/
- Making Cloud Collages http://sassafrasscience.com/cloud-collages-uncle-cecil-activity/
- https://www.nasa.gov/centers/langley/pdf/245892main_MeteorologyTeacherRes-Ch16.r3.pdf

Teacher Preparation:
- Invite an Elder or Recognized Expert into the classroom to share stories and traditional knowledge relating to clouds as traditional weather predictors.
- Prepare the students on being respectful and courteous of Elders/guests in the classroom.
- Review the books, YouTube video and gather materials needed for the lesson.
- Send out permission forms for a field trip, if needed, to observe the weather, clouds and collect items to make their weather collage.

Opening:
Our Elders have shared their traditional ecological knowledge (TEK) of predicting weather by careful observation of cloud formation and movement. (Introduce the Elder guest if available). There are many different beliefs that were used to predict weather, listen carefully to the following Elder quotes:
- *"Cloud streaks high in the sky means it is going to be windy." -Mary Malchoff, Port Graham*
- *"Cap on St. Elias. In Cordova, if there is a cap (clouds) on it (St. Elias Mountain) means it is going to blow." -Tom Anderson, Cordova.*
- *"Dark clouds means there will be rain, snow, or wind" Tom Yeaton Sr., Port Graham.*
- *Elders have also stated that when clouds create a circle around the sun and the moon is an optical effect which is a sign that the weather is going to get bad.*

How many of you have seen these types of clouds that streak in the sky? Have you seen clouds over a mountain like a cap? What about clouds those seem to create a circle around the sun or moon? Did you hear about the various beliefs before today? Now, I will be reading about the

weather lore of the Chugach people from the Chugach Eskimo book. Again, I would like you to listen carefully and think about whether you have personally seen or experienced some of these weather lores.   (Read the excerpt in *Chugach Eskimo*, on page 115, out loud to the students.)

Activities:
Class I:
1. If available, introduce Elder to share TEK on cloud identification and what it may mean for weather forecasting.

2. For additional information on clouds use NOAA's "Clouds Out My Window"
    a. https://www.weather.gov/media/owlie/CloudsOutMyWindow.pdf

3. Pass around the picture of different clouds (or have pictures projecting on the smartboard) and have a discussion on which clouds were used to indicate the weather according to Chugach Region Elders and how it correlates with current weather forecasting. For example: dark clouds mean it is going to rain, streaking clouds mean it is going to get windy, fluffy clouds are clouds on nicer calm days and clouds that are moving are caused by the wind in the direction the clouds originated.

4. Show the YouTube video on identifying types of clouds.
    a. https://www.youtube.com/watch?v=yod3wMbFHUY

5. Say the Sugt'stun or Eyak words out loud and ask the student to repeat after you as you point to the clouds. Repeat this process until you feel the students can say and identify what they are saying.

6. Have the students get prepared to go outside so they can observe the clouds and compare them to the pictures they were shown earlier.

7. Hand out a Ziploc baggie to each student and ask them to gather items like grass, moss, twigs, gravel, etc. that they want to use to create an art collage (picture) that shows a replica of what they have observed.

8. When return to the classroom, ask the students to draw a picture and design the clouds they observed outside by gluing the cotton balls on a sheet of construction paper. Then have them decorate it by gluing on the grass, twigs, and gravel they found outside to create a realistic picture.

Assessment:
- Students correctly identify various cloud types.
- Students are able to recite the Sugt'stun/ Eyak vocabulary words used for clouds.
- Students can explain and give an example of how cloud observation was traditionally used to predict the weather.