

## TRADITIONAL WEATHER FORECAST: SUN, MOON & STARS GR: 9-12 (LESSON 1-2)

### Elder Quote:



*"Crescent moon; tilted, if the moon is crescent and if it looks like it is leaning backwards, it's holding back the weather. If the crescent moon is leaning forward it's dumping out the weather."*

-Patience Faulkner, Cordova

### Grade Level: 9-12

### Overview:

The people of the Chugach region, like indigenous people everywhere, traditionally used the sun, moon and stars to predict the weather. Through centuries of careful observation passed along the generations, the Chugach peoples are still able to plan hunting and harvesting activities based on this traditional ecological knowledge. Here students investigate the Western Science explanations of these time-honored predictive techniques.

### Standards:

AK Cultural:	AK Content Science:	CRCC:
<b>AK 6</b> – Culturally-knowledgeable students are well grounded in the cultural heritage and traditions of their community	<b>A 3</b> – Science as Inquiry and process. A student should understand and be able to apply the processes and application of scientific inquiry.	<b>Survival S 7</b> - Students should be able to learn/observe the weather and tides.

### Lesson Goal:

In this activity lesson the students will learn how to predict the weather by observing the sun, moon and stars with the help of the Elder TEK.

### Lesson Objectives: Students will:

- Review and compare traditional ecological knowledge with Western Science.
- Investigate how the sun, moon, and stars can be used to predict the weather.
- Design a poster presentation explaining the relationships between TEK weather predictions and their underlying scientific explanations.
- Use Sugt'stun and/or Eyak vocabulary words in their posters

**Vocabulary Words:**

Sugt'stun Dialects

English:	Prince William Sound:	Lower Cook Inlet:	Eyak:
Sun	<i>Macaq</i>	<i>Macaq</i>	<a href="#"><u>GAdAgiL</u></a>
Moon	<i>Tangik</i>	<i>Ing'iq</i>	<a href="#"><u>qAXah</u></a>
Stars	<i>Agyat</i>	<i>Agyat</i>	<i>Ia'Xts'L</i>
It's going to rain tomorrow.		<i>Qitegcakut Unuaqu</i>	
Many stars are out.		<i>Aqyat Amlertaqakat</i>	
Waning moon		<i>Tanqik Nangqartarkut</i>	
New Moon, sliver moon		<i>Tanqik suumauq</i>	
Good weather (Lit: "the moon is holding good weather")		<i>Paluluku</i>	
Bad weather (Lit: "the moon is spilling bad weather")		<i>Asikut Qutartuq</i>	

**Materials/Resources Needed:**

- Eyakpeople.com/dictionary
- Sugt'stun App downloaded (Only available for Apple products)
- Elder quotes and Old Beliefs Handout (See below)
- Laptop or iPad with internet connection
- Poster Boards (one per student research group) and markers
- Book: Aaron, G. *The Weather Tracker Handbook*
- Book: Johnson, J.F., & Page, B. (1984) *Chugach Legends*, pp. 57-60
- Book: Mitchell, W.W. *Chugach Navigation*
- Book: Stamp, B. (2010) *Chenega: As I Saw It – It's People*, pp.13-16
- Book: Woodmency, J. (2012) *Reading Weather*

**Teacher Preparation:**

- Review Activity Plan and practice Sugt'stun or Eyak vocabulary.
- Invite an Elder/Recognized Expert that could share his/her expertise on traditional weather forecasting.

- Before the Elder/Recognized Expert arrives, review with students how to respectfully interact with the Elder during his or her visit.
- Review the definition of Traditional Ecological Knowledge (TEK) and its relationship to western science.
- Review the books listed above to gather some of the TEK information that relates to the sun, moon and stars to help with this activity lesson.
- Print off copies of the Elder quotes or beliefs for the students to use.
- Print off Science Poster Prompts off of Chugachmiut Cultural Heritage webpage for each student

### **Opening:**

Discuss the definition of Traditional Ecological Knowledge (TEK):

*Traditional Knowledge is a systematic way of thinking applied to phenomena across biological, physical, cultural and spiritual systems. It includes insights based on evidence acquired through direct and long term experiences and extensive and multigenerational observations, lessons and skills. It has developed over millennia and is still developing in a living process, including knowledge acquired today and in the future, and it is passed on from generation to generation.*  
 (Inuit Circumpolar Conference 2014)

We will be looking at Elder Quotes and Old Beliefs Handout and see the correlation between the TEK and western science and creating a science poster with the information.

### **Activities:**

#### **Class I:**

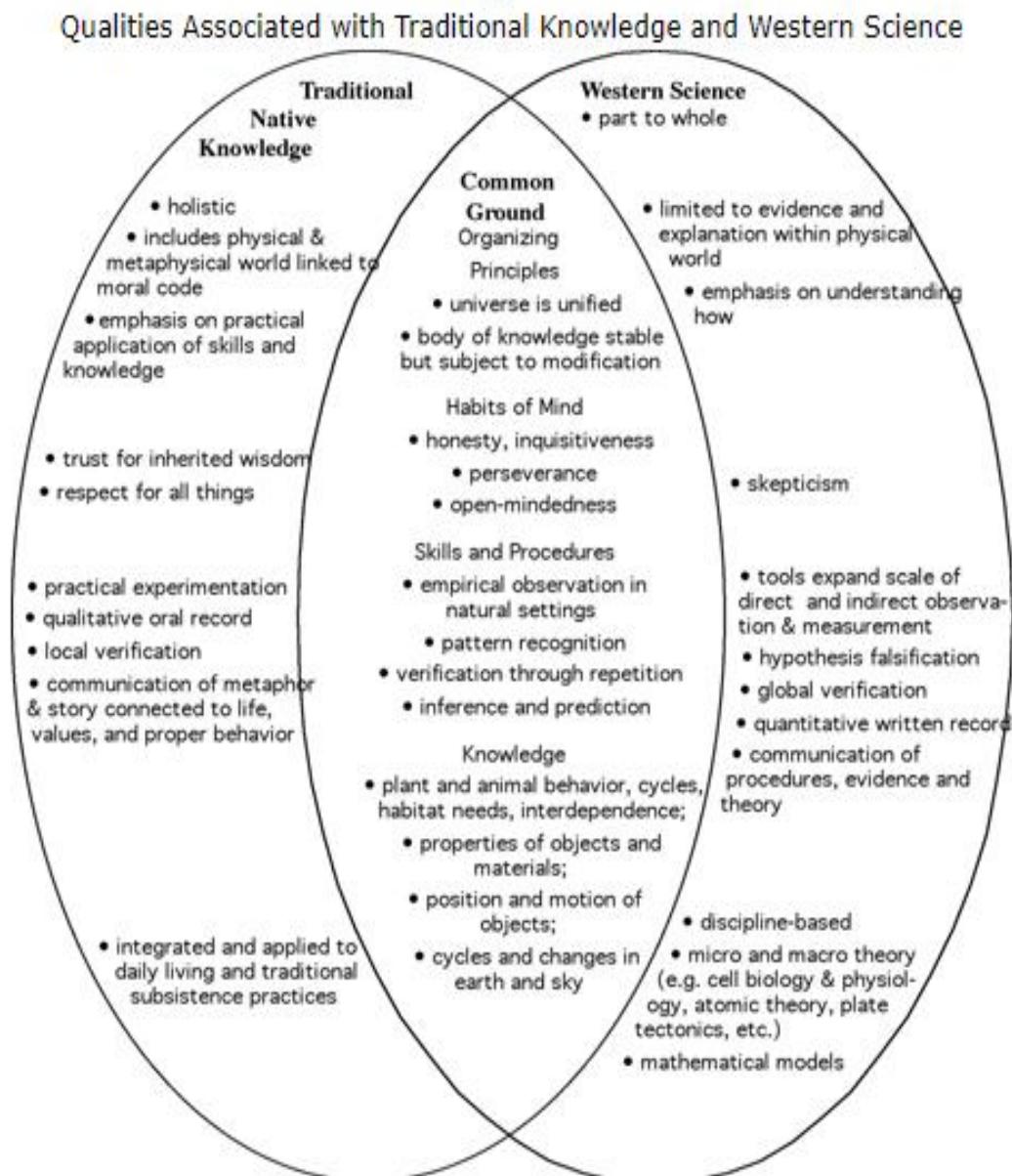
1. If available, introduce the Elder to share personal examples of both learning and using traditional weather forecasting techniques.
2. Discuss how these TEK skills correlate with the western science methodology. (See Venn Diagram below.)
3. Divide students into small groups or have them work individually on the TEK Weather Project. Explain that students will use their handouts and the kit library books to identify at least three related TEK weather forecasting techniques. Students will then research online the underlying scientific explanations of how the sun, moon, stars, (and clouds) contribute to these predicted weather patterns.
4. If time allows, ask the students to design a science poster to relay their findings.

#### **Class II:**

1. Distribute poster boards, markers and Science Poster Prompts to each group.
2. Pooling their research results, ask the students to create a science poster which includes:
  - a. TEK weather prediction methodology and the underlying scientific explanations.
  - b. Students should be sure to credit their sources and present their information in a visually engaging manner.
  - c. Include Elder quote(s)
  - d. Where possible Sugt'stun /Eyak vocabulary words included in this lesson should be included on their posters.
3. Students present their posters and give an overview of their work to the class.

### **Assessment:**

- Students discussed and compared traditional ecological knowledge (TEK) with western science.
- Students researched how the sun, moon, and stars were traditionally used to predict the weather and correlate these finding with western science..
- The students created a science poster presentation of their weather prediction research.
  - Poster included Elder quote
  - Sugt'sun and/or Eyak vocabulary words integrated into their posters.



*Chenega: As I Saw It – It's People*  
By Bobby Stamp - Weather-Related Old Beliefs, pp.13-16

“There was a belief that the sea and all the plants and animals had gods (*spirits*), wind, sun and every different thing had a god (*spirit*).” p.13

“Then [when] we were real young as kids, there were things that they did not want us to do, such as catching little fish or fooling around with little bird nests. We were told that we would cause it to rain and we would not do those things. Little birds or chicks from ducks or any kind of bird were to be left alone, they were pets of the gods and we were not to offend the gods.” p.14

“You were not supposed to curse the weather or the fire; it would pay you back for the deed and cause something to happen.” p.15

“When you whittle or carve when the weather was good it was supposed to be a bad omen for bad weather. When I whittled, I was told not to do it or it will cause it to rain and blow.” p.15

“Spiders and bumble bees we would catch and put outside. If we hurt them we were told that it would bring bad ... (weather).” p.15

“When the magpie comes down from the mountain early, means early winter.” p.16

“Lots of big brown jellyfish means a cold winter.” p.16

“Fog coming out of the trees means it will clear up, westerly wind,” p.16

“Fog on top of the mountains or on the side of them means southwest wind.” p.16

“They were called [Nantiinaq] **Nan teen na** or ‘fog men’ they moved around in the fog. We were not supposed to speak badly about them or curse them or they would cause something to happen to you.” p.16

*Chugach Legends – Weather-related Old Beliefs*

“When you burn eggshells, wind was supposed to blow the next day.” p.57

“When you burn green grass, it was supposed to make it rain.” p.57

“The weatherman – there was another one for that. He had a fine feather, a down feather. He tied the feather to the stick. In the morning he goes out to check it. If a little wind stops for a while, there will be no wind today. Even when there’s no wind, if the feather moves, there is going to be a big storm today, sometime later in the day. Sure enough it comes. They can tell that by the feather they hold.” p.58

“Everyday, he has to check the weather by watching the stars. When the stars twinkle slow it’s going to be a fine day, no wind tomorrow. When the stars flutter fast that means it’s going to be a windy day the next day. p.58

## Additional Elder Quotes and Old Beliefs

*“Crescent moon; tilted, if the moon is crescent and if it looks like it is leaning backwards, it’s holding back the weather. If the crescent moon is leaning forward it’s dumping out the weather.”*

- Patience Faulkner, Cordova

*“Northern lights were a good indicator that the weather was going to get cold.”*

- Patience Faulkner, Cordova

*“Every day he has to check the weather by watching the stars. When the stars twinkle slowly it’s going to be a fine day, no wind tomorrow. When the stars flutter fast that means it’s going to be windy the next day.”* - Sergius Moonin, Nanwalek, Alexandrovsk Vol. 2 – Old Beliefs.

*“Full moon means there will be big tides, when there are big tides it gets windy, also minus tides for octopus hunting and bidarki picking.”* – Stella Meganack, Port Graham

*“Clouds that are red during the sunrise means there will be bad weather. Red clouds at sunset mean there will be nice and clear weather.”* - Stella Meganack, Port Graham

*“Crescent moon; when there is a crescent moon and if it looks like the moon is leaning more towards the open this means it is spilling out the bad weather. If the crescent moon is leaning backwards it is holding in the bad weather and the weather will be nice.”*

- Mary Malchoff, Port Graham

*“If there is a circle around the sun or moon, it means that there is going to be bad weather.”*

- Jenny Kamluck, Port Graham