

Elder Quote/Belief:



“It is getting warmer, windier, no snow, rainier, it’s changing,” the Elders, long time ago, said it would be like this. Nupuat picurtuq nuna ciimertuq aqllat maqiluta.”

– Lilian Elvaas

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Grade Level: 9-12

Overview: Climate change is altering our environment and impacting the resources that many people depend on for their winter supplies. Elders have noticed that here is less snow on the mountains, winds have increased, more rain, and less ice in the winter. The ocean has warmed up which is changing the diet for fish, sea mammals and water fowl, which in turn, changes our traditional foods.

Standards:

<i>AK Cultural:</i>	<i>AK Content Science:</i>	<i>CRCC:</i>
D 4 gather oral and written history information from the local community and provide an appropriate interpretation of its cultural meaning and significance;	F3 Develop an understanding of the importance of recording and validating cultural knowledge.	C2 Students should know about the history of natural and manmade disasters and the impact on the Chugach Region

Lesson Goal: To learn about the impacts of climate change according to the Elders traditional ecological knowledge (TEK) in conjunction with western science.

Lesson Objective(s):

- Learn and apply Sugt’stun/Eyak vocabulary to assigned projects
- Define and research Climate Change
- Interview an Elder/Recognized expert, family or community member about climate change
- Research the impacts of the warming ocean
- Develop a hypothesis of the future of climate change
- Create two projects:
 - An electronic presentation of the TEK research in conjunction with western science to share with class (possibly school and/or community)

- A poster that depicts Elder TEK with western science and a hypothesis of future climate change (Submit to a local science conference and the Chugachmiut Heritage Preservation website)

Vocabulary Words: Sugt'stun Dialects

English:	Prince William Sound:	Lower Cook Inlet:	Eyak:
Weather	Llakcaq	Lla'm cimiucia	
Cloudy	Taluluku	Taluluku	q'ahs (clouds)
Rain	Qitaq	Qiteq	k'uleh
Snow	Qaniq	Qaniq	xAtl'
Foggy (to be)	Umegtuq	Umegtuq	q'Ayiiny
Wind	Aqllaq	Aqllaq	k'uuy
Ice	Cikuq	Cikuq	
Sunny	Macaruaq	Macaruaq	sAndii (sun)

Materials/Resources Needed:

Invite Elder/Recognized Expert
 Permission form of consent for photos and quotes (if needed)
 Computers, iPads, smart phones
 Butcher paper
 Poster Board
 Markers/Paint/Crayons
 Camera/electronic device for taking pictures
 Magazines

Websites:

Eyak dictionary <http://www.eyakpeople.com/dictionary>

Chugach Regional Resource K-12 Commission Science Curriculum Project
<http://www.iqsak.org/lessons/unit-4-lesson-plan-2>

Research sites for students:

Retreating of Sheridan Glacier <https://vimeo.com/144847513>
 Stressors and impacts
<https://toolkit.climate.gov/case-studies/addressing-links-between-climate-and-public-health-alaska-native-villages>

Climate Impacts in Alaska

https://19january2017snapshot.epa.gov/climate-impacts/climate-impacts-alaska_.html

Climate Change in Alaska

<https://www.commerce.alaska.gov/web/dcra/ClimateChange.aspx>

Alaska Climate Change Science

<https://www.fws.gov/alaska/climate/>

Impact of Climate Change on the health of Alaskans

<http://www.ktuu.com/content/news/Report-identifies-negative-effects-of-climate-change-on-Alaskans-health-468495783.html>

Climate Change in Alaska impacts environmentally, socially and economically

<http://www.adfg.alaska.gov/index.cfm?adfg=ecosystems.climate>

Alaska canary in the climate coal mine

http://www.slate.com/articles/technology/future_tense/2015/03/climate_change_is_already_affecting_alaska_s_weather.html

Humans trigger climate change

<https://www.edf.org/climate/9-ways-we-know-humans-triggered-climate-change>

Temperature changes in Alaska

<http://akclimate.org/ClimTrends/Change/TempChange.html>

Video:

Alaska Youth for environmental action

<https://www.edutopia.org/video/stand-alaska-alaska-youth-environmental-action>

Rapping about Climate Change

<http://passporttoknowledge.com/polar-palooza/whatyoucando/taacc/>

Sea Surface Temperature

<https://alaskapublic.pbslearningmedia.org/resource/ean08.sci.ess.watcyc.seasurface/sea-surface-temperature/?#.W3X3RdIzWUk>

Students making a difference

<https://alaskapublic.pbslearningmedia.org/resource/ean08.sci.ess.earthsys.kidskenai/students-making-a-difference/?#.W3XzpNIzWUk>

Warmer oceans affect food web

<https://alaskapublic.pbslearningmedia.org/resource/ean08.sci.life.eco.foodfish/warmer-oceans-affect-food-web/?#.W3X2cNIzWUk>

Teacher Preparation:

- Contact local Elder/Recognized Expert to come into classroom to talk about climate change and if they have photos of changes they have witnessed in their life to share with the class
- Review suggested web sites
- Set out all material and lists for students to research
- Prepare students with questions for the Elder/Recognized Expert
- Have students make a card to thank invited guest for sharing their knowledge
- Share students work on the Chugachmiut Heritage Preservation website

Opening: Climate change is challenging for many coastal communities; how is this going to continue to impact the environment, the food sources, provision for fish and mammals, what kind of food source will there be if candlefish are no longer available due to warming waters?

Activities:

Class I:

1. Review Sugt'stun/Eyak vocabulary words with students
2. Before guest arrives, review the interview question prompts located on the webpage under prompts and then brainstorm with students to come up with questions , i.e.:
 - What does climate change mean to you?
 - What environmental changes have you witnessed?
 - Are there other changes you have seen?
 - Have you noticed any impacts due to climate change?
 - Do you feel that climate change is here to stay?
 - Who/what do you think caused climate change?
 - Do you have any ideas what we can do now about what is happening?
3. Inform students they will need to write down questions and responses
4. Introduce guest to class, reminding students:
 - Be respectful
 - Allow guest enough time to answer question(s)
 - Ask permission to take pictures
 - Ask permission to use quotes for a presentation
 - Invite guest to come back and listen to presentations
5. Take pictures of students visiting with invited guest and (if permitted), videotape the invited guest sharing their TEK with students.
6. Share pictures and recording with students afterwards for use in presentations.
7. Assign homework to students where they will need to interview an Elder/community member/family member about climate change. Remind them they will need to obtain permission to use photos/recordings for their presentations. (Allow several days to obtain their interviews.)

Class II:

1. Watch the suggested videos with students, research sites and assign the students to take notes. These will be reviewed and given points. Inform the students that their notes can be used in their electronic presentations as well as their posters:

Suggested Videos:

- Alaska Youth for environmental action
 - <https://www.edutopia.org/video/stand-alaska-alaska-youth-environmental-action>
 - Rapping about Climate Change
 - <http://passporttoknowledge.com/polar-palooza/whatyoucando/taacc/>
2. Assign students to research the following sites for their presentations:
 - Sea Surface Temperature

- <https://alaskapublic.pbslearningmedia.org/resource/ean08.sci.ess.wateyc.seasurface/sea-surface-temperature/?#.W3X3RdIzWUk>
- Warmer oceans affect food web
 - <https://alaskapublic.pbslearningmedia.org/resource/ean08.sci.life.eco.foodfish/warmer-oceans-affect-food-web/?#.W3X2cNIzWUk>
- Retreating of Sheridan Glacier
 - <https://vimeo.com/144847513>
- Stressors and impacts
 - <https://toolkit.climate.gov/case-studies/addressing-links-between-climate-and-public-health-alaska-native-villages>
- Climate Impacts in Alaska
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- Climate Change in Alaska
 - <https://www.commerce.alaska.gov/web/dcra/ClimateChange.aspx>
- Alaska Climate Change Science
 - <https://www.fws.gov/alaska/climate/>
- Impact of Climate Change on the health of Alaskans
 - <http://www.ktuu.com/content/news/Report-identifies-negative-effects-of-climate-change-on-Alaskans-health-468495783.html>
- Climate Change in Alaska impacts environmentally, socially and economically
 - <http://www.adfg.alaska.gov/index.cfm?adfg=ecosystems.climate>
- Alaska canary in the climate coal mine
 - http://www.slate.com/articles/technology/future_tense/2015/03/climate_change_is_already_affecting_alaska_s_weather.html
- Humans trigger climate change
 - <https://www.edf.org/climate/9-ways-we-know-humans-triggered-climate-change>
 - Students making a difference
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- Temperature changes in Alaska
 - <http://akclimate.org/ClimTrends/Change/TempChange.htm>

3. Refer to the Elder quote above by Lillian Elvsaaas, and ask the students if the Elders were correct when they made reference to the changes they predicted? Did you think that our guest and your interviewee have similar thoughts?

4. Have a discussion about what they understood from these videos and research sites and ask them to hypothesize what they think will happen next if we do not do anything about climate change.

5. Document student's comments onto the whiteboard or onto butcher paper as students take notes. These can also be used in their presentations.

6. Ask students to compile all the resources they have researched including the interview from their household/community and Sugt'stun/Eyak vocabulary words to prepare for creating project.
7. Encourage students to be creative such as a rap song, puppets, or dances, etc.
8. Allow students ample time to create their electronic presentations

Class III

1. Have materials available for students to make their science posters.
 - a. Refer to the science poster prompts on the Chugachmiut Heritage web page, located under prompts
2. Inform students to utilize all available resources that they collected previously
3. Allow time to work on the posters
4. Once students are finished creating their electronic presentation and poster, they will present to the class (school and/or community)
5. Work with students to make a card thanking guest and interviewees for their participation
6. OPTIONAL: Students can submit presentations to the Chugachmiut Heritage Preservation website and submit their posters to local science conferences, for instance posters can be submitted to the following:
 - <https://www.alaskamarinescience.org/>
 - <https://kbayscience.org/presentations.html>

Assessments:

- Student created an electronic presentation on climate change that successfully incorporated all the following elements:
 - Elder interview sharing TEK regarding climate change
 - Sugt'stun/Eyak vocabulary words in their presentation and poster
 - Research findings and defined climate change
 - Hypothesis of the future of climate change
 - Ways to stop/slow down climate change
- Student successfully created a poster that included Sugt'stun/ Eyak vocabulary words, Elder's TEK and the correlation to western science.
- Student successfully presented their electronic presentation and science poster to class
- Student submitted their poster to a science conference

ⁱ Lillian Elvsaaas, born in Port Graham, mother of two children, grandmother of two, Lillian loves her traditional foods and gathers when she can.