

# Unit 1: DAY 2

- **AK State Standard(s):** HS-ETS1-1 Analyze complex problems...
- **AK Cultural Standards for Curriculum:**
  - A1, B1, C1, C3, C7
- **Iñupiaq Iilitqusiatic:**
  - *Iñuuniaqatiunik Ikayuutiitig - Responsibility to Tribe, Iļisimatiq Iļagiitgimik - Knowledge of Family Tree, Savaqatigiuyitq – Cooperation, Kamakkutiitig - Respect for Others*
- **Learning Objectives:** stated in the "I Can" format.
  - I can describe the four basic branches of Earth Science.
  - I can describe how curiosity about the world can guide scientific inquiry.
  - I can describe different ways to seek knowledge about the world.
- **Success Criteria and Relevance:** (how will I know they learned it?)
  - The student will be able to introduce themselves using traditional methods.
- **Resources/Materials:** what you will be using during your class.
  - Canvas
  - PowerPoint slides
  - A printed copy of the introduction page
- **Instructional Strategies, and Student Activities:** list in order what you will be doing in class with your students.
  - See Below
- **Classwork / Homework:**
  - In class discussion
- **Assessments (Daily Check-in):** what will you use as an assessment for learning today?

## 30 Minutes

### 1) Discuss:

- a) Yesterday we discussed procedures for this class and course and the importance of traditional knowledge.
- b) Let's take 5 minutes and go find two people you did not introduce yourself to yesterday.
  - i) Take this time to introduce yourself using the traditional protocol.

### 2) Discuss:

- a) **Today we will discuss three essential questions that will help guide you as we move through this class.**
  - i) What is Earth Science?
  - ii) How does curiosity about the world around us impact and guide scientific inquiry?
  - iii) What are some of the different ways to seek knowledge about the world around us to make more sense of it?
- b) **Essential Question #1: What is Earth Science?**
  - i) Earth science is the name of the science group that studies the Earth and its neighbors in space.
  - ii) There are four basic sciences studied as Earth Science.
    - (1) Geology: the study of the earth.
      - (a) "Geo" means "earth" and "ology" means "study of". Therefore, the definition of geology is the study of the Earth. Scientists who study geology learn about Earth's physical structures, processes, minerals, and history. Geologists study topics that include plate tectonics, earthquakes, rivers or streams, fossils, and even the formation of the Earth. <https://study.com/academy/lesson/what-is-geology-definition-history-facts-topics.html>
    - (2) Meteorology is the study of the atmosphere, weather, and climate phenomena.
      - (a) *Meteorology* comes from the Greek *meteōrologia* meaning "of the atmosphere." While meteorology involves various branches including aviation and agricultural studies, most commonly we see it in our everyday lives through weather forecasting,

a process that involves collecting data about an atmosphere to determine what the weather will be. <https://www.vocabulary.com/dictionary/meteorology>

(3) Oceanography: the study of the oceans.

(a) “Oceanography (compound of the Greek words meaning “ocean” and “write”), also known as oceanology, is the branch of Geography that studies the ocean. It covers a wide range of topics, including ecosystem dynamics; ocean currents, waves, and geophysical fluid dynamics; plate tectonics and the geology of the sea floor; and fluxes of various chemical substances and physical properties within the ocean and across its boundaries.” <https://eartheclipse.com/science/geography/what-is-oceanography-and-what-does-oceanographer-do.html>

(4) Astronomy: the study of the universe.

(a) Astronomy, (from [Ancient Greek ἄστρονομία](#) (*astronomía*) 'science that studies the laws of the stars'), is the study of everything in the universe beyond Earth's atmosphere. That includes objects we can see with our naked eyes, like the sun, the moon, the planets, and the stars. It also includes objects we can only see with telescopes or other instruments, like faraway galaxies and tiny particles. And it even includes questions about things we can't see at all, like dark matter and dark energy. <https://www.amnh.org/explore/ology/astronomy/what-is-astronomy>

iii) The study of the Earth and its processes is not a new idea and is certainly not new to the people of the Northwest Arctic Borough.

iv) The Iñupiaq people of this region have used their skills and knowledge about the Earth around them to help them survive for thousands of years.

c) **Essential Question #2: How does curiosity about the world around us impact and guide scientific inquiry?**

i) The Iñupiaq word for curiosity is Summankiaq, which means to wonder why.

(1) Many of us start with a strong sense of curiosity.

(2) We want to find answers and explore the world around us.

ii) Curiosity allows us opportunities that we wouldn't have if we just accepted the results and never asked “why?”.

(1) When we look at the reasons behind a process and think about how we could apply this elsewhere, we begin the process of discovery and invention.

(2) Someone curious wants to find answers.

iii) Curiosity helps us survive.

(1) The urge to explore and seek information and experience helps us gain knowledge about our constantly changing environment.

iv) Curiosity helps strengthen relationships.

(1) Demonstrating curiosity is a great way to strengthen relationships within the family and tribe, allowing for discovering new situations and possibilities leading to success.

d) **Essential Question #3: What are different ways to seek knowledge about the world around us to make more sense of it?**

i) Humans are born curious.

(1) From birth, children use trial-and-error techniques to learn about the world around them.

(2) As children and as adults, when faced with an unknown situation, we try to determine what is happening and predict what will happen next.

<https://nap.nationalacademies.org/read/9596/chapter/2#5>

ii) We reflect on the world around us by observing, gathering, assembling, and processing information.

iii) We develop and use tools to measure and observe as well as to analyze information and create models.

- iv) We check and re-check what we think will happen and compare results to what we already know.
- v) We change our ideas based on what we learn.  
<https://nap.nationalacademies.org/read/9596/chapter/2#5>
- vi) This complex set of thinking abilities, which helped early humans gather food and escape danger, makes up the highly developed capacity we refer to as inquiry.
- vii) It is well documented that societies across the world used scientific inquiry and processes to deduce and explain why things happen.
- viii) The ancient Egyptians, Indians, Chinese, and Persians over thousands of years, developed methods for analyzing mathematical and scientific questions (1,2).
- ix) Later, the ancient Greeks, such as Aristotle, used information from these other societies to develop a standard process for research, experimentation, and study  
(1) <https://www.twn.my/title2/resurgence/2012/266-267/cover09.htm>  
(2) [https://en.wikipedia.org/wiki/Timeline\\_of\\_the\\_history\\_of\\_the\\_scientific\\_method](https://en.wikipedia.org/wiki/Timeline_of_the_history_of_the_scientific_method)
- x) This process became the foundation for Western Science because it was refined by the Greeks and others in the western world.
- xi) The work of Galileo Galilei and Isaac Newton continued to establish the process that eventually became known as the scientific method.  
(1) [https://en.wikipedia.org/wiki/Timeline\\_of\\_the\\_history\\_of\\_the\\_scientific\\_method](https://en.wikipedia.org/wiki/Timeline_of_the_history_of_the_scientific_method)
- xii) The scientific method traditionally begins with an observation or question followed by a prediction or hypothesis which is then tested.
- xiii) Next, the results of testing are analyzed, interpreted, and shared.
- xiv) Laws and theories are then developed.
- xv) Scientists today have come to understand that the scientific method is simply a guide to test and understand our world.
- xvi) We recognize that science is not and has never been only a western European invention.
- xvii) Indigenous science is the scientific knowledge that Indigenous people developed independently of western science.  
[https://livingknowledge.anu.edu.au/html/educators/02\\_questions.htm](https://livingknowledge.anu.edu.au/html/educators/02_questions.htm)
- xviii) It is the process used by indigenous people, such as the Iñupiaq, to gain and then share knowledge of their natural environment.
- xix) The Indigenous Iñupiaq people of the Northwest Arctic have a long-standing and complex relationship with the area around them.
- xx) Going back thousands of years, the Iñupiaq people have acquired knowledge of their world.
- xxi) Indigenous science is the practical application of theories of knowledge about the nature of the world.
- xxii) While Indigenous knowledge sometimes contrasts with scientific knowledge, it can also be complementary and provide supplementary information about the world.
- xxiii) Indigenous people often incorporate Western scientific knowledge into their practices.
- xxiv) **Traditional Inupiaq knowledge is a cumulative body of knowledge and practices developed by people over generations.**
- xxv) It represents a history of experiences, careful observations, and experimentation.
- xxvi) It is embedded in culture, spirituality, and world views expressed in stories, songs, proverbs, customary laws, and language.  
<https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2019/04/TK-Emerging-trends-in-the-generation-transmission-and-protection-of-TK-final-paper.pdf>
- xxvii) **Traditional Inupiaq knowledge is passed on from elders to youth.**
- xxviii) In our youngest children, it is passed through observation and guided practice.

- xxix) As children get older and more capable, independent practice with supervision.
- xxx) Then, when you are ready, you begin to teach others with supervision.
- xxxi) The knowledge, innovations, and practices of Indigenous Peoples are the foundation of much of the world's modern science and continue to provide a significant and valuable source of input.
- xxxii) It is increasingly recognized that unlocking the potential of traditional knowledge can help modern society address significant challenges ranging from climate change and sustainable agriculture to new pathways for sustainable development for ensuring the livelihoods of indigenous and local communities.  
<https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2019/04/TK-Emerging-trends-in-the-generation-transmission-and-protection-of-TK-final-paper.pdf>

e) **ACTIVITY:**

- i) Go to the link below and read about Inupiat whale hunters working with scientists to study bowhead whales.
- ii) <https://www.adn.com/alaska-news/rural-alaska/2022/08/07/sharing-traditional-knowledge-inupiat-hunters-advance-whale-science/>
- iii) In CANVAS, write one paragraph about how native knowledge has helped scientists develop a better understanding of whales.
- iv) As we have learned, Traditional Inupiaq Knowledge explains phenomena in the world around us and is shared from generation to generation.
- v) This knowledge was built on asking questions and then problem-solving for the answer.
- vi) This knowledge can co-exist with “Western” science to bring a greater understanding of the world around us.

f) **HOMEWORK:**

- i) Today after school, talk to your parents, or an elder that you know and have them share two things that were taught to them by their elders which helped them understand more about survival skills during the winter.
- ii) Enter this into the canvas assignment.
- iii) Be prepared to share in class tomorrow.

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