

**Unit 1**  
**Introduction to Earth Science and Developing Science Skills**  
**Scope and Sequence**

Auraq – Summer – June/July/Aug  
 Ukiaksraaq – Early Fall - Aug/Sept/Oct

**10 Days**

Essential Question(s)	Key Learning Objectives	Assessments, Labs, and Activities	Key Terms & Vocabulary	Performance Expectations
<ul style="list-style-type: none"> <li>• What is Earth Science?</li> <li>• How does curiosity about the world around us impact and guide scientific inquiry?</li> <li>• What are different ways to seek knowledge about the world around us to make more sense of it?</li> <li>• How do we develop science skills?</li> <li>• How are scientific investigations best designed?</li> <li>• What benefits are to be gained from studying and exploring the world in which we live</li> <li>• What information do maps give earth scientists?</li> </ul>	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>• Demonstrate Lab Safety.</li> <li>• Describe Scientific Inquiry                             <ul style="list-style-type: none"> <li>○ Western Science</li> <li>○ Indigenous Science</li> <li>○ Common Ground</li> </ul> </li> <li>• Describe skills used to understand the natural world:                             <ul style="list-style-type: none"> <li>○ Observing</li> <li>○ Inference</li> <li>○ Prediction</li> <li>○ Classification</li> <li>○ Measurement</li> </ul> </li> <li>• Describe how scientific laws and theories develop.</li> <li>• Describe the process for Scientific Problem Solving using both Western and Indigenous knowledge:                             <ul style="list-style-type: none"> <li>○ Make a hypothesis about the outcome of simple experiments.</li> <li>○ Carry out procedures to test hypotheses.</li> <li>○ Understand and organize data using various techniques.</li> <li>○ Analyzing data to identify independent variables, dependent variables, and constants in an experiment.</li> </ul> </li> <li>• Construct line graphs of data points for two variables and utilize graphs to draw conclusions about relationships and extrapolate unknown data points.</li> </ul>	<p><b>Assessments:</b></p> <p>Informal:</p> <ul style="list-style-type: none"> <li>• Discussion, classwork, group work</li> </ul> <p>Formal:</p> <ul style="list-style-type: none"> <li>• Homework, quizzes, tests, projects</li> </ul> <p><b>Labs:</b></p> <ul style="list-style-type: none"> <li>• Science Safety</li> <li>• The Scientific Process Critiqued</li> <li>• Variables 1, 2,3</li> <li>• Measurement Skills Lab                             <ul style="list-style-type: none"> <li>○ Compare traditional and modern measurement tools.</li> <li>○ Measuring items in and around the school.</li> </ul> </li> <li>• Observation and Inference, Animal Footprints</li> <li>• Evaluating Precision                             <ul style="list-style-type: none"> <li>○ Length, Temperature, Volume</li> <li>○ Distance</li> <li>○ Target practice – how is this skill used / compare accuracy and precision skills needed for hunting</li> </ul> </li> <li>• Volume and Temperature                             <ul style="list-style-type: none"> <li>○ Discuss how temperature impacts volume.</li> <li>○ How does this relate to the rivers when water freezes and thaws?</li> <li>○ Will this impact safety when travelling?</li> <li>○ How does</li> </ul> </li> <li>• Flow rate of the river: Using this measurement describe how this along with temperature impacts boating, hunting, and fishing?</li> <li>• Density Lab</li> <li>• Measuring Earth: Latitude and Longitude</li> </ul>	<ul style="list-style-type: none"> <li>• Earth Science</li> <li>• Geology</li> <li>• Oceanography</li> <li>• Meteorology</li> <li>• Astronomy</li> <li>• Scientific Method</li> <li>• Experimentation</li> <li>• Hypothesis</li> <li>• Scientific Law</li> <li>• Theory</li> <li>• Procedure</li> <li>• Analysis</li> <li>• Dependent Variable</li> <li>• Independent Variable</li> <li>• Constant</li> <li>• Control</li> <li>• Conclusion</li> <li>• Infer</li> <li>• Precision</li> <li>• Accuracy</li> <li>• Reliability</li> <li>• Validity</li> <li>• Inference</li> <li>• Investigation</li> <li>• Observation</li> <li>• Data analysis</li> <li>• Empirical evidence</li> <li>• Qualitative data</li> <li>• Quantitative data</li> </ul>	<p><b>HS-ESS2-2</b>  <b>Students who demonstrate understanding can:</b>      Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.</p> <p><b>HS-ESS2-4</b>  <b>Students who demonstrate understanding can:</b> Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.</p> <p><b>HS-ESS2-5 S</b>  <b>Students who demonstrate understanding can:</b> Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.</p> <p><b>HS-PS1-3</b>  <b>Students who demonstrate understanding can:</b> Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.</p> <p><b>HS-PS1-5</b>  <b>Students who demonstrate understanding can:</b> Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting</p>

	<ul style="list-style-type: none"> <li>• Explain why consistent units of measurement for time, length, and mass are necessary for better science understanding.</li> <li>• Correctly measure and calculate: <ul style="list-style-type: none"> <li>○ Mass, Weight, Length, Area, Volume, Time, Density</li> </ul> </li> <li>• Properly use Earth Science Reference Tables</li> <li>• Describe how Map Types / Mapping Earth give information <ul style="list-style-type: none"> <li>○ Latitude/Longitude</li> <li>○ Location</li> </ul> </li> <li>• Mapping Earth Systems</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring Earth: Field Maps and Isolines</li> <li>• Measuring Earth: Reading a Topographic Map</li> <li>• Measuring Earth: Making a Topographic model of your area</li> </ul>	<p>particles on the rate at which a reaction occurs.</p> <p><b>HS-PS2-1. Students who demonstrate understanding can:</b> Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.</p>
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<p><b>Multimedia Links:</b></p> <p>*Videos, presentations, any and all supplemental online material.</p>	<ul style="list-style-type: none"> <li>• <a href="http://www.discoveryeducation.com/">http://www.discoveryeducation.com/</a></li> <li>• <a href="https://app.discoveryeducation.com/learn/videos/5CA80B21-4F9F-47D2-A906-844D7F13AF7A">https://app.discoveryeducation.com/learn/videos/5CA80B21-4F9F-47D2-A906-844D7F13AF7A</a></li> <li>• <a href="https://app.discoveryeducation.com/learn/videos/E936D178-9D65-4CE6-886F-E10C84062305">https://app.discoveryeducation.com/learn/videos/E936D178-9D65-4CE6-886F-E10C84062305</a></li> <li>• <a href="https://emediava.org//38332">https://emediava.org//38332</a></li> </ul>
<p><b>Interdisciplinary Lessons &amp; Projects:</b></p> <p>*State additional content areas and title all lesson(s) and project(s)</p>	<ul style="list-style-type: none"> <li>• Science/Geography/History <ul style="list-style-type: none"> <li>○ <i>Earth Science: Mapping the Earth</i></li> <li>○ <a href="https://app.discoveryeducation.com/learn/videos/5CA80B21-4F9F-47D2-A906-844D7F13AF7A">https://app.discoveryeducation.com/learn/videos/5CA80B21-4F9F-47D2-A906-844D7F13AF7A</a></li> </ul> </li> <li>• Science/Language Arts/Technology <ul style="list-style-type: none"> <li>○ <i>Greatest Discoveries with Bill Nye</i></li> <li>○ <a href="https://app.discoveryeducation.com/learn/videos/E936D178-9D65-4CE6-886F-E10C84062305">https://app.discoveryeducation.com/learn/videos/E936D178-9D65-4CE6-886F-E10C84062305</a></li> </ul> </li> </ul>
<p><b>Instructional Practices:</b></p> <p>*Various Instructional Modalities, including technology used</p>	<ul style="list-style-type: none"> <li>• Daily Bell work to review or introduce topics</li> <li>• Shared reading/ discussion</li> <li>• Independent work</li> <li>• Homework/assigned independent reading</li> <li>• Lab Activities</li> </ul>
<p><b>Indigenous Cultural Connections</b></p>	<ul style="list-style-type: none"> <li>• (Working on these as units are developed)</li> </ul>
<p><b>Links to standards</b></p>	<p>The following links will be used to incorporate the NGSS, and State of Alaska Standards:</p> <p><a href="https://education.alaska.gov/standards">https://education.alaska.gov/standards</a></p> <p><a href="https://education.alaska.gov/akstandards/standards/AKStandards_ELAandMath_edited7.25.22.pdf">https://education.alaska.gov/akstandards/standards/AKStandards_ELAandMath_edited7.25.22.pdf</a></p> <p><a href="https://education.alaska.gov/akstandards/science/science-standards-for-alaska.pdf">https://education.alaska.gov/akstandards/science/science-standards-for-alaska.pdf</a></p> <p><a href="https://www.nextgenscience.org/">https://www.nextgenscience.org/</a></p>