

Classroom Implementation Strategy Template

Due Date: **DRAFT or OUTLINE** due Before Departing for the Expedition
FINAL due 1 Year After Returning from the Expedition

Title	Sediment transport and Arctic food webs in a changing climate
Subject	Earth Science/Climate Science
Grade Level	8 th and 9 th (Earth Science)
“Big Ideas”	
Overview of National Standards	NGSS not used in Utah
Your State’s Performance Standards	<p><i>Utah Core, Earth Science:</i> 3.3e Investigate the current and potential consequences of <u>climate change</u> (e.g., ocean acidification, sea level rise, desertification, habitat loss) on <u>ecosystems</u>, including human communities.</p> <p><i>Utah SEEd Standards, Grade 8:</i> 8.4.4 Analyze and interpret data on the factors that <u>change</u> global temperatures and their <u>effects</u> on regional climates. Examples of factors could include agricultural activity, changes in solar radiation, fossil fuel use, and volcanic activity. Examples of data could include graphs of the atmospheric levels of gases, seawater levels, ice cap coverage, human activities, and maps of global and regional temperatures.</p> <p>8.4.5 Analyze and interpret <u>patterns</u> of the occurrence of natural hazards to forecast future catastrophic events, and investigate how data is used to develop technologies to mitigate their effects. Emphasize how some natural hazards, such as volcanic eruptions and severe weather, are preceded by phenomena that allow prediction, but others, such as earthquakes, may occur without warning.</p>
Internet Links/Resources	
Major Events or Activities: “The Learning Plan”	<ul style="list-style-type: none"> - Reading journals, joining PolarConnect, interacting with Kaktovik students (first few weeks of school) - Measuring sediment cores, engaging with other Arctic Glacial Lakes data, graphing and discussing results (one class period) - Measuring sediment flow on the Escalante River (once class period) - Modeling changes in Arctic Ecosystems (one class period)
Essential Questions	<p>Why is sediment transport important to ecosystems?</p> <p>How does sediment transport change over time?</p> <p>What impact does climate have on sediment transport and ecosystems?</p>
Safety Considerations	Visiting the Escalante River has minor safety concerns (water, unpredictable outdoor environment), otherwise none.

Assessment	Assessment Plan: Formative assessment will be conducted continuously through discussions, think pair share, and strategic questioning. Students will be assessed at the end of the unit using the models they create of how sediment transport, influenced by climate, will impact arctic food webs.	
5 E Inquiry Model	Engage	Students follow my journals while I am deployed, participate in my Polar Connect event. My students interact with Kaktovik students about the Arctic environment.
	Explore	After looking at a map of ANWR (including the glacier, Lake Peters, and the watershed that drains by Kaktovik), students measure photos of lake cores to collect data on sediment deposition and track glacial extent over time. Students make observations and hypotheses based on their observations.
	Explain	After sharing hypotheses, students graph data to look more deeply at patterns between glaciers and sediment transport. Teacher moderated discussions lead students to a deeper understanding of the connection between sediment transport and climate.
	Extend	Students apply their understanding of sediment and flow to a desert ecosystem. Students predict how sediment transport changes throughout the year in Escalante, then measure sediment transport in the Escalante River.
	Evaluate	Students create models of how a changing climate may impact coastal Arctic food webs.
Strategies or other information (optional)		
Documentation of Resources		