

Needs Assessment

Personal Vision

My vision of my classroom is that my students are actively engaged in authentic learning experiences every day. They frequently have the opportunity to design their own research and make their own scientific discoveries. Each topic they learn is connected to real world applications and current scientific research. As they meet scientists and engage with real data, my students understand that anyone with a drive to discover can be a scientist and that science will open doors for experiences of many kinds.

Realities of Classroom

Workload: As I am in a rural school, I have 7 preps, so it is difficult to redevelop curriculum and plan in depth lessons for all of my classes. Each lesson I plan is only used once a year since I have no duplicate classes.

Time: We have a block schedule and I see students for each class only 144-192 minutes a week and because we are so rural, I frequently have half of my students gone traveling for sports events.

Motivation: Low student, parent, and faculty motivation can make it difficult to plan and conduct activities that require any sort of involvement outside of class (whether that is showing up for an event/field trip, getting chaperones, or giving assignments that require out of school work)

Student Needs

- 7th: Understand the relationship between energy flow and matter in the processes of weathering, erosion, deposition, and sedimentation
- 7th: Understand the geologic time-scale in lake sediment cores and how they relate to the history of earth
- 7th: Identify adaptations in polar organisms help them survive and reproduce in a harsh environment
- 8th: Compare different O₂ ions from different sources
- 8th: Evaluate evidence for climate change, including lake sediments and glacial extent
- Earth: Understand the importance of the Arctic in global atmospheric and ocean currents
- Earth: Evaluate evidence for climate change, including lake sediments and glacial extent
- Earth: Examine data on changes in hydrology throughout the year in the Arctic
- Biology: Examine the importance of energy flow in an Arctic food web
- Biology: Identify adaptations in polar organisms help them survive

and reproduce in a harsh environment

Changes to Teaching Methods

- Networking – I would like invite more scientists into my classroom, which will require me to be willing to ask people to come, maintain positive and current relationships with a wide variety of scientists and experts, and plan far in advance to best accommodate multiple schedules
- Data sets – I want to use more authentic data sets for students to explore and come up with their own hypotheses and conclusions
- Evidence (and quality) – I want my students to be able to collect quality evidence, so I need to give them more opportunities to engage with different types of evidence and evaluate the quality of that evidence.
- Active/outdoor learning – I want to spend more time in amazing surroundings of our school and using the outdoors the explore scientific topics

Concepts to teach better/differently

- Sediment transport – energy and deposition
- Hydrology
- Using data to recreate Earth's history
- The importance of the Arctic in global systems
- Using evidence to support hypotheses

What I Expect to Learn

- Sediment transport/hydrology in glacial basins
- Difficulties of remote Arctic research
- How to better communicate science and excite my audience
- How Arctic ecosystems rely on the hydrology of glacial basins

Equity and Expectations

- Give girls role models by interviewing and profiling the many female scientists that I will be working with and collecting data for
- Be a role model by setting a goal and following through
- Showing students the many opportunities that one can have in scientific fields, even if they are from rural areas
- Making connections with a remote Alaskan school that is predominantly Native Alaskan so my students can have a connection to another culture and way of life

Realistic ways to share experience with students

- Journaling and a PolarConnect Event

- Have a PolarConnect event during the first weeks of school to set the tone for the year
- Tailor journals to specific standards in the curricula so that I can use them all year
- Incorporate data collection and comparisons to the Arctic into my lessons. For example:
 - Tea Time 4 Science (planting tea bags to measure organic matter decomposition) in both the Arctic and with my students in Escalante
 - Sediment cores with students in Escalante to compare with glacial lake cores
 - Plant cover of the tundra and desert
- Use Arctic Glacial Lakes data sets in lessons