Needs Assessment

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PolarTREC 2014: Arctic Sunlight and Microbial Interactions

Classroom Vision

My classroom vision is to weave the PolarTREC experience and polar science into my lessons and classroom space. By making PolarTREC and polar science part of my classroom environment,

Expected student outcomes include:

By the end of the school year (both prior to and after expedition), students should be able to:

-Correctly name and describe the PolarTREC program

-Correctly identify where my field work took place

-Correctly describe, at least in general, what my field work experience involved

-Go to polartrec.com and ask relevant questions or make relevant statements about field expeditions

-Correctly describe polar science lessons and why these lessons relate to us in California, far from the polar regions

I will share my experience by:

-Continuing to make my students, their families, and our school community aware of the PolarTREC expedition, and inviting them to follow my expedition

-Hanging posters and having handouts announcing the expedition and how to follow me. These will be out for the school’s open house in my classrooms and the other science classrooms. Most current and in-coming families attend open house.

-Continuing to post messages about PolarTREC on our school web site and to all staff

-While in the field, I will carry out experiments and observations designed by students and post results on my journal.

-I will send postcards to my students and to students from other schools

-After returning from the expedition, I will have displays related to the expedition and polar science in my classroom

-I will integrate polar science lessons into curriculum, and share lessons with the science department.

Classroom Realities that may Hinder Vision

Our district is moving toward a common pacing guide that will be shared among grade level science teachers throughout the district. I do not know the details of the pacing guide, but my concern is that the guide will hinder flexibility with lessons.

Despite my enthusiasm about polar science and willingness to share lessons and ideas, not all teachers are interested in incorporating polar science lessons into their curriculum. This hinders the dissemination of polar lessons among science teachers.

Realistic Ways the Experience May be Shared With Students

I am working now, before the expedition, to connect as many students as possible to the project. My goal is that these students will keep an interest in polar science regardless of whether or not I am their teacher next year.

I will personalize, as much as possible while maintaining student privacy, journal posts.

I will collect environmental data on my own following techniques and using instruments that allow the data collection to be replicated locally. I will encourage students to replicate my data and present their findings in a local and county-wide science fairs.

Specific Student Needs Related to Curricula (For Middle School Students)

Students need to be able to correctly name, identify, and describe the Arctic and Antarctica

Students need to name and describe Earth’s systems (lithosphere, atmosphere, hydrosphere, biosphere, and cryosphere), and describe how these systems are interrelated. Students should be able to describe how an event in one system influences another system.

Students should recognize the influence that polar systems have on global and local environments. This will personally connect students to polar science.

Five Things I Expect to Learn During the PolarTREC Experience

1. Details about how carbon stores are leased from thawing permafrost

2. Details about the roles sunlight and bacteria play in release of carbon stores

3. Details about the role microbes play in carbon release

4. Lab procedures used to measure the above variables

5. Details about thermokarsts

6. Details about other projects taking place at Toolik that I can’t even imagine at this point.

Things that I Would Like to Learn

I want to learn more about carbon release from soil. I would like to then investigate whether (or how much) carbon is being released from the local Springtown Wetlands Preserve soils and the brown grass now covering California hills.

I’m curious about physiological reactions that will occur when in 24 hour daylight.

I’m curious about the plants, flowers, birds, and animals that I will see at Toolik, and how these compare to local sightings.

Concepts I Would Like to Teach Better

I already teach about the relationships of Earth’s systems, but want to improve on this.

I will use research experience as examples to better teach students how to conduct independent research projects and to present those projects at science fairs.

I would like to give students a better understanding of the duties and experiences of working scientists. The goals are for students to better understand how science is done and the relevancy of current research and science news, and to increase student interest in science, technology, and math careers.

Equity Expectations for Students

Students I teach show wide diversity in interests, academic abilities, and ethnic and social backgrounds. My goal is to interview and then journal about as many people at Toolik as possible, and to ask about their backgrounds and interests when they were in middle school and high school.