**PolarTREC Education Strategy Template**

**Purpose:** The Education Strategy focuses on integrating the PolarTREC experience with your primary audience at your institution. Answering these questions will define your audience, goals, assessment, institutional support, and sustainability as the building blocks to create a product for use with your primary audience.

**Process:** Keep open communication with PolarTREC managers about your product ideas in the early stages. They can connect you with program mentors and additional resources. Create a short document (~1-2 pages) with the intention of revisions pre- and post- expedition. Share your Education Plan in writing with your research team and PolarTREC managers. It is advised that you also share your plan with appropriate stakeholders such administrators, supervisors, funders, peers, your audience’s parents, PolarTREC peers and mentors, etc.

**Education Plan Components:**

* Describe your primary education audience.

Agua Caliente Elementary School, a K-6 Public school in Tucson, Arizona, is my primary audience. I also have colleagues at Tanque Verde Elementary and Emily Gray Junior High following my expedition and participating in the lessons I have created.

I have facilitated several Professional Development workshops this summer and have handed out over 250 business cards with my expedition’s information on it. I have handed out cards to K-12 teachers in Maricopa County (Phoenix,) Graham County, and Pima County. I have also shared my information with several districts and teachers in Tucson.

The lessons I am creating are geared for grades K-8.

* What do you want the audience to learn?

This project/expedition will assess contributions of different shrub feedbacks to carbon and nitrogen cycling, and improve predictions of the consequences of shrub expansion in the Arctic for regional and global climate.

I want the audiences to understand where the Arctic is located (Geography) and why the changes that are happening with the ecology is important to us here locally in the Sonoran Desert and global impacts.

Because some of my audience is young and isn’t developmentally ready to fully understand the global impact of the Arctic changes, I am starting with education about where the Arctic is located, plants and animals that call the biome home, and simple plant competition and energy exchange lessons.

* Describe the inquiry-based model you will use with your audience.

In May, I was awarded a $500 grant from our local Tanque Verde Foundation. With this grant, I have purchased $300 worth of books on the Arctic (and a few on Antarctica for comparison!) I have compiled lessons and activities for grade levels K-8 and have shared with my colleagues, as well as teachers from other districts. I have also purchased the supplies needed to conduct science experiments for the lessons. For example, students will be using Crisco and mittens and seeing energy transfer and how Arctic animals use adaptations to survive the harsh climate. Another example is with radish seeds and plant competition. They will grow the seeds in trays with varied number of seeds planted in the cells of the planting tray. This will directly relate back to the abundance of deciduous shrubs and how it is affecting the other smaller native plants.

This collection of books and lessons are to be done while I am in the field by my colleagues. I will check in with the participating classes and see where they are with their projects.

When I return from the field, my overarching theme for the year will be about the science happening at the poles. I have set up lessons in my Google Classroom for my 90 6th grade students to complete.

* What assessment tools and/or metrics will you use to meet your institutions standards for successful educational experiences?

Page Keeley’s formative assessment probes have been embedded into the collection of lessons. My students use Interactive notebooks so there will be assessments embedded throughout all of my lessons for my 6th grade students as well.

* What must be in place to ensure your institution’s support to achieve these goals?

My institution is completely supportive. I will be in the field for the first couple of weeks of school, so my Principal and Librarian will be the main contacts and will share the resources that I have created.

I have already contacted the IT department to set up Skype for the classrooms/teachers, as well as make sure that we can have an all school assembly for the PolarConnect event.

* What components of the product are transferable to other education scenarios?

Provide opportunities or alternatives for both formal and informal educators to utilize your product.

All the lessons are housed in Google Drive and have been shared with other educators. The only non-transferable materials are the books that were purchased for our school, but the books are really supplemental materials for the lessons. I have added the book titles as resources for others who may not have access to them.

The lessons are currently aligned to our Arizona State Science Standards. These standards are being re-evaluated and new standards will hopefully be adopted in August of 2018. The lessons are also aligned to the NGSS standards.

Classroom Implementation Strategy

Field Outline

Educational plan to implement polar research into the classroom

My expedition takes place over the summer and therefore I will miss the first few weeks of school. My guest teacher will be working with my students and will Skype with me as often as possible. While I am in the field, she will be reviewing world geography emphasis on Arctic locations. The students will be tracking the temperature of Tucson, Fairbanks, and Prud

General Introduction to Arctic Polar species: mammal, bird, fish, amphibian, reptile, and insects.

Introduction to polar ecosystem, and comparative analysis to Tucson Arizona and the Sonoran Desert ecosystem

Introduction to the Arctic Ecology: Google Classroom

* Introduction to the ecology of the tundra’s ecosystem.

Google Classroom- Introduction to the Arctic assignment Part A.

Resource: http://arctic.ru/print/106

* Construction of a comprehensive word list with definitions of Polar specific terminology,

Example: tundra, hummock, Pingo, polar desert, forest-tundra transition zone, taiga

* Introduction to the population of the tundra’s ecosystem.

Google Classroom- Introduction to the Arctic assignment Part B.

Resource: <http://arctic.ru/print/106>

* Arctic Ecosystem: PBS Learning Media resource:

There are several videos, discussion questions, and essay prompts throughout this Arctic unit in PBS Learning Media.

Construction of a new plant species with specific adaptations to meet its ecosystem, emphasis on adaptations, and the species not becoming invasive.

Arizona Science Standards

Strand 4: Life Science

Concept 3: Populations of Organisms in an Ecosystem

PO 1: Explain that sunlight is the major source of energy for most ecosystems

PO2: Describe how the following environmental conditions affect the quality of life

* Water quality
* Climate
* Population density
* smog