

Details



Completion Time: More than a week

Permission: Download and Share

Scientific Research in an Extreme Environment

Overview

The journal assignment involves students in current science research. Through the teacher's journals, they will learn about how the research teams work together, design their research, tools that are needed and how they live and work in an extreme environment.

Objectives

Students will be able to

- Understand how scientific research is conducted in an extreme environment.
- Understand that scientific inquiry is part of the nature of science.
- Describe how evidence is collected in the field
- Submit their questions to the research team
- Present the expedition and research that they followed to the rest of the class.

Lesson Preparation

Arrange for a computer lab to get everyone started with selecting an expedition from the PolarTREC website (www.polar-trec.com). Students will need to know how to access the journal entries and "Ask the Team" Question and Answer section on the website. Reviewing how scientists record data and how journals have been used by scientists in the past would be an engaging beginning to the assignment.

Procedure

Journaling Assignment for the PolarTREC Expeditions in Antarctica, 2008-2009**

**Please note that even though this assignment is now dated with expeditions that are now completed, there are other opportunities for students to follow and participate in real-time research. This assignment is a guideline for involving students in the nature of science.

Materials

- Internet access
- Notebook
- Map(s) for the classroom of the study area.

March 2007 began the 4th International Polar Year (IPY). It will continue through two full years. The last IPY was 50 years ago. There has been ongoing research in the Polar Regions all along, but the IPY has emphasized the need to know more since rapid changes are occurring.

There are several teachers working with researchers in Antarctica as I did when I went to Summit, Greenland. On the website, <http://www.polartrec.com>, look at the Virtual Base Camp (left side of the webpage). Click on the current expeditions, one at a time, and read about who is on the expedition, what they are doing, and where they are:

- Antarctic Undersea ROV '08 with teacher Cameo Slay Baugh (Nov 4-Dec 19)
- Ancient Buried Ice in Antarctica with teacher Jacquelyn Hams (Nov 4-Dec 15)
- Erebus Volcano Antarctica with teacher John Wood (Nov 21-Jan 5)
- Oden Antarctic Expedition '08 with teacher Jeff Peneston (Nov 25-Jan 12)

Decide which one of these expeditions that you would like to follow. There will be webinars (a live Internet conference with video and real-time voice contact) with the teachers and researchers while they are in Antarctica. Depending on the time of the webinars, your class may be participating.

Keep your journal organized. Do not mix your journal with other class notes or writing, number your pages in the top right corner, and write on only one side of the paper.

For the first journal entry, include this information:

- Identify (label) which expedition you are following.
- Summarize who is on the expedition, what they are doing, where they are and the dates of the expedition.
- Summarize what has been happening based on the teacher's journal entries.
- Questions (at least one) you have after reading about the expedition regarding the scientific research.

In subsequent journal entries, always include the following:

- Date you are writing.
- Summary of what has happened from the last time you read (approx 1 entry every week) the Expedition journal such as the dates of their journal, how far they have traveled, what experiments have they done, etc. This written summary should be at least one page.
- Questions (at least one) at the end of your entry regarding the scientific research or living and working in an extreme environment.

You will need to have a minimum of 5 journal entries for the expedition you have chosen. Access the website and the journal at least once a week. Your last entry should be a reflection about what you have learned from reading the journal entries and the 'Ask the Team' questions/answers about the scientific research as well as how the team worked and lived in the Antarctic.

Please note that you will probably have to spend time at home reading the expedition journals. If you do not have Internet at home, computers with Internet access will be available at school.

Your journal grade will be based on your organization, number and quality of entries, and questions that you have included and submitted. This will be due after the Christmas break (before end of semester).

Group Presentation:

Students following the same expedition will get together at the end of the expedition to plan their Power Point presentation to the class. Groups should include the following:

- basic information about when, where and who were part of the expedition
- purpose of the research
- methods of data collection
- observations made
- tools used for collection data
- how problems were solved during the expedition
- how the team lived and worked in a polar area.

Two class periods in a computer lab will be provided to create the PowerPoint.

Extension

1. Use the questions from the journal entries to submit to the “Ask the Team” section of the Expedition website or use the questions during the webinar.

2. Depending on the focus of the expedition’s research, students could research

- the food web of animals/plants mentioned in the journals
- migration patterns of animals which are studied
- gases given off by volcanoes and how they affect the atmosphere
- cause for active volcanism in Antarctica
- comparison of Mt. Erebus with other volcanoes
- ocean currents and how they have changed over time with plate movement and climate change
- using students’ questions to generate their own research

3. Students will discuss the expedition with their family and add comments or questions from family members to their journal.

Resources

<http://www.polartrec.com>

Assessment

- Journal grade: The assignment lists specific information to include. A rubric can be built



using the journal requirements.

- Group Presentation grade: Each student in the group will be responsible for specific information about their expedition. The group will submit their presentation plan and determine who is responsible for information prior to creating the PowerPoint. Student slides will be merged into one presentation for each group. Students will present their section of the slide presentation to the class.

Credits

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National Science Education Standards (NSES):

Content Standards, Grades 9-12

Content Standard A: Science As Inquiry

- a. Abilities necessary to do scientific inquiry
- b. Understandings about scientific inquiry

Content Standard E: Science and Technology

- b. Understandings about science and technology

Content Standard G: History and Nature of Science

- b. Nature of scientific knowledge

Other Standards:

N/A