



## List of Required Materials

### Introduction - Arctic alive!

- Background (Have available as a transparency, a handout, in student journal or online.)
- If desired, bind all student journal pages, background and appendix into one booklet per student to be used for the duration of the study.
- Arctic alive! Student Journal Pages (If not in journal mentioned above.)
- Optional, create a kit of items related to the Arctic – ideally tangible items.
- Maps provided in the atlas section, ecosystem/biome, cultural and political circumpolar perspectives of the Arctic. Have prepared as transparencies or print enough for students to have available to them. (Optional, blank map of the Arctic. See extension activity.)
- Grading Rubric: Student Journal

### Investigation 1.2 - Earth System Science

- Background (Have available as a transparency, a handout, in student journal or online.)
- Diagrams: Layers of the Earth, Energy, Water, and Carbon Cycles
- Hard-boiled egg, cut in half across its width as a model for layers of the earth
- Optional, light source to represent the sun
- Earth System Science - Student Journal Page(s)
- Activity: “Water Wonders” Project Learning Tree
- Reading, “Water: The Sum of its Parts” NSTA Physical Oceanography

### Investigation 1.3 - Climate Change

- Background (Have available as a transparency, a handout, in student journal or online.)
- If available, video “The Science of Change” Natural Resources Canada
- NOAA/NASA/EPA factsheet, “How Do We Take the Earth’s Temperature?”
- Reading: “Question & Answer/Classroom Demonstration on the Greenhouse Effect and Global Warming: (Optional, materials for demonstration for Greenhouse Effect Demo. 2 large glass jars, \_” soil in each jar, 2 thermometers, light sources & 150 watt bulb.)
- Reading : “Community-based Monitoring Program, 2000-2001: Inuvialuit of Aklavik, Northwest Territory, Canada”

### Investigation 1.4 - A Case Study – Sea Ice Research

- Background (Have available as a transparency, a handout, in student journal or online.)
- Diagrams: Light Spectrum, wavelength  
Illustration of reflection, refraction, absorption  
Nutrient Cycle and Energy Cycle
- If available, video “Secrets of Ice” from Natural Resources Canada
- Student Journal Pages – Sea Ice Research
- Materials for Lab, “Which Get Hotter: Light of Dark Surfaces?”  
Lab write-up, lamp with 100 watt bulb, black cup/can with insulated lid, white cup/can with insulated lid, two thermometers and ruler.
- Materials for optional activity, “Core Sampling”

Bread, peanut butter, jelly, cream-cheese (or other spread-able substitutes), knife, clear plastic straws.

- Recommended/Optional: Lesson, graphs and questions for, “Interpreting Ice Core Data” at <http://www.secretsoftheice.org/icecore/studies.html>

#### **Investigation 2.1 – Albedo Transects**

- Background (Have available as a transparency, a handout, in student journal or online.)
- Speaker Phone
- Student Journal Pages – Albedo Transects
- Arctic alive! Audio Conference Activity Sheet

#### **Investigation 2.2 – Ice Core Research**

- Background (Have available as a transparency, a handout, in student journal or online.)
- Speaker Phone
- Student Journal Pages - Ice Core Research
- Arctic alive! Audio Conference Activity Sheet

#### **Investigation 2.3 – Local Knowledge – Cultural and Biological**

- Background (Have available as a transparency, a handout, in student journal or online.)
- Speaker Phone
- Student Journal Page – Local Knowledge, Cultural and Biological
- Arctic alive! Audio Conference Activity Sheet

#### **Investigation 2.4 – Data Analysis – UAF Cold Lab**

- Background (Have available as a transparency, a handout, in student journal or online.)
- Speaker Phone
- Student Journal Page – Student Journal Pages, Albedo Research and Ice Core Research
- Arctic alive! Audio Conference Activity Sheet

#### **Investigation 2.5 – Local and Global Impacts and Interventions**

- Background (Have available as a transparency, a handout, in student journal or online.)
- Speaker Phone
- Arctic alive! Audio Conference Activity Sheet

#### **Investigation 3.1 - Geosciences**

- Background (Have available as a transparency, a handout, in student journal or online.)
- Computers, ideally, one per student and internet access
- Career Exploration Worksheets

#### **Investigation 3.2 - Policy Debate**

- Background (Have available as a transparency, a handout, in student journal or online.)
- Character Cards
- Background Readings

#### **Extension Activities**

See individual activity