SCIED 411 Peer Teaching 4 and Clinic 2  
November 26, 2008

Presenters  
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Grade Level and Topic  
6th-8th grade  
Ice Ages and their Effect – An in-depth study of ice ages and their effect on life.

Standards  
PA Academic Standards for Science and Technology (Biological Sciences – Grade 7)  
3.3.7.D: Describe how an environmental change can affect the survival of organisms and entire species.

3.5.7.A: Describe the processes involved in the creation of geologic features (e.g., folding, faulting, volcanism, sedimentation) and that these processes seen today (e.g., erosion, weathering crustal plate movement) are similar to those in the past.

National Science Educational Standards  
C.4.a.3.-Changes in the Earth including erosion and land formation

Instructional Objectives  
- Understand the forcings that induce ice ages  
- Understand how ice ages affect survival and migration of organisms.  
- Understand the greenhouse effect on ice and the resultant repercussions.

Content Explanation  
Ice ages is an often neglected theme in middle school seventh grade geoscience classrooms. Developing an understanding of ice ages will allow children to become more informed citizens and make objective decisions regarding the greenhouse effect. Specifically, how anthropogenic enhancement of the naturally occurring greenhouse effect can reduce global ice and how that can affect humanity. Furthermore, they will come to understand how ice ages can affect survival.

Initially the students’ current understanding of ice ages, greenhouse effect, and natural selection will be evaluated. Next, based on their current knowledge, explanations of ice ages, greenhouse effect, and natural selection will be given with the aid of diagrams and pictures. Later, the students will be asked to envision and describe the effects of two scenarios: if an ice age just happened, and if all current global ice melted. Then, students will be asked to propose potential solutions and comment on the moon and why there are not ice ages. Finally as an evaluation, student will be given worksheets that and asked to fill in as many pertinent vocabulary words as possible.

Administrative Considerations  
- none

Materials and Equipment  
- none

Lesson
**Engage (7min)**
- What are some of the differences between ice and water?
- Fresh water VS Sea water and how that relates to ice.
- What are the processes contributing to the development of an ice age?
- What is an ice age (definition, critical cutoff for ice age)?

**Explore (4min)**
- Guiding question: What were some of the conditions during an ice age?
  - Southern migration of animals; competition.
- What about during an interglacial year?
  - Northern migration of animals, like foxes.

**Explain (4min)**
- Does anyone here ski? If so, why goggles?
  - What is albedo, and how does it relate to ice ages?
- How does the greenhouse effect affect ice?
  - Show a picture of glacier extent before and after?
  - Trace the Ohio and potentially Missouri rivers.
- How does ice affect survival of organisms?
- Students will be asked to explain what they know about the greenhouse effect?

**Elaborate (3min)**
- What are some of the things humans do that impacts ice, and how that relates to the greenhouse effect?
- Students will be asked what would happen if we were in an ice age?
  - Relate to emperor penguins, and foxes
- Students will be asked what if all of the ice melted?
- Do ice ages occur on the moon?

**Evaluate (2min)**
- Worksheet: Using the following pertinent vocabulary (albedo, greenhouse effect, reflectivity, gas, write and draw what would happen to a certain species if an ice age came about