Everest Education Expedition Curriculum

Classroom Activity: Research Gear and Equipment Using a GPS for Geological Research

The Everest Education Expedition Kits received by some Montana classrooms included a GPS unit, which the Montana State University team uwed for research.

This activity is designed to simulate the geological research conducted during the 2012 EEE team on Mount Everest and requires teachers to purchase or borrow a basic GPS unit (or several) and a small number of rock samples. Teachers should have a working knowledge of the GPS and how to set waypoints before conducting the activity.

Students will better understand how GPS equipment is employed by geologists through an outdoor exercise using rock samples and a basic GPS unit provided in the teacher kit (the kit included samples of limestone, limestone with fossils, granite, garnet and schist, although teachers may use any rock samples that are available). Ideally, students should have studied the samples enough so that they can identify them without aid from the rock guide or teacher. However, this may not be possible for increasingly large classes, but students should at least be familiar with the rock samples. Also, teachers will have shown students how to use the GPS to save waypoints and navigate between waypoints. Once these conditions are satisfied, the teacher may set up the exercise.

Exercise: Teachers will start by hiding the rock samples in different locations around the school property before class. For each sample hidden the teacher will save a waypoint on the GPS unit and record which rock is hidden at each waypoint. Then, students will use the GPS to navigate to each waypoint and therefore, to each rock sample. Once the student has found the rock sample, he or she must record what type of rock they have found. If they wish, teachers can then grade students on their recorded answers.

The instructions for this exercise are intended to be guidelines and teachers should adjust them depending on class size and time available. If only one GPS is in use, it would be impossible for each student to do this exercise individually. But, even if teachers had to guide their students as a whole class, then kids would at least grasp the concept of how GPS is used by geologists in the field.

ADDITIONAL RESOURCES
The following Web links will give you more information about GPS/GIS in Montana
MontanaView: Focused mainly on remote sensing; also does GPS and GIS in our outreach.
http://montanaview.org/

GeoEssentials.com: Non-profit educational group run by retired MSU professor Van Shelhamer.
www.geoessentials.com

Lisa Blanks and Jeff Crews at University of Montana are involved in teaching spatial science in schools. Their site includes modules on Google Earth and climate along with many others.
http://www.spatialsci.com/

The Montana Geographic Alliance is run by faculty affiliated with Geography at University of Montana; includes a lot of K-12 outreach using GPS & GIS.
http://www.cas.umt.edu/geography/alliance/
Look under Classroom Resources/ Technology for some examples. This network of teachers is very extensive around the state and has been for decades.

The Montana Climate Office is located at University of Montana.
http://www.cfc.umt.edu/MCO/Default.aspx

Other GPS activities and resources
Cornell University 4-H: http://nys4h.cce.cornell.edu/about%20us/Pages/SETToolkit.aspx

Earth Science Week: http://www.earthsciweek.org/

National Geographic's Geography Awareness Week:
http://education.nationalgeographic.com/education/collections/geographyawarenessweek/

Mapping the Environment (from Missouri Botanical Garden)
http://www.mobot.org/education/mapping/mapcr.html

USGS Rocky Mountain Mapping Center http://rockyweb.cr.usgs.gov/outreach/

GPS and geocaching in the classroom (North Carolina State)
http://www.ncsu.edu/meridian/win2007/gps/04.htm