

# **--Earth Science--**

## ***Geology, Geography, Cartography***

Grade 9: Youth Initiative High School

Viroqua, Driftless Area, North America

September 21- October 8, 2009 – Jacob Hundt,

The goal of this block is to locate ourselves on the surface of the planet Earth. We will begin with an examination of the unique and powerful language of maps. We will touch on the history of navigation and of the mapping of the dimensions of the Earth and students will be introduced to the various symbols and conventions that give maps their power to communicate. We will also discuss what makes the various types of maps different from one another and try our hands at making and using maps of different types.

Once we have this common language of cartography in hand, our task will be to gain some understanding of the major physical features present on the Earth's surface and their often astonishing histories. We will explore the basic concepts of geology, including the different categories of rocks and minerals and the rock cycle. We will examine the powerful forces that drive mountain ranges into the sky and tear continents apart, as well as the subtler, but no less powerful, forces that have shaped the gentle landscape of hills and coulees with which we are familiar. We will attempt to reconstruct an account of the geological forces and events that created the landscape of Wisconsin and of the unique Driftless Area in which we live. In this area, we will have the privilege of working with Kelvin Rodolfo, a former professor of geology at the University of Illinois and a specialist in volcanism and in karst geology. We will also make a visit to the Kickapoo Reserve for a guided geology tour with geologist Chuck Hatfield.

## **Class Requirements:**

### **1. Class Participation and Geography Quizzes: 30% of total**

Active participation in all class discussions, activities, field trips, and in a series of short map quizzes covering world geography. Students are expected to show steady improvement over the course of the class. The three students with the highest cumulative scores will receive a homemade pie (probably chocolate, perhaps apple or pumpkin).

### **2. Hand-Drawn Maps: 30% of total**

Students are expected to complete one polished, hand-drawn, properly formatted and labeled map for each week of the block. Students should come prepared with a good set of colored pencils.

- The first will be a map of any region, real or imagined, of their choosing incorporating a set of specified cartographic features. **Due Monday, Sept. 28**
- The second will be a topographic map of a location that they are personally familiar with. If the location is in Wisconsin, students can find topographic maps of different scales for all parts of the state using the Wisconsin DNR WebView site ([maps.dnr.state.wi.us/webview](http://maps.dnr.state.wi.us/webview)). **Due Monday, October 5**
- The third will be a physiographic map of Wisconsin, including a set of required features. **Due Friday, October 9**

### **3. Block Test: 40% total**

During the last week of the class, we will have a test covering topics from throughout the class. There will be multiple-choice, essay, and short answer questions, as well as questions requiring the drawing of a simple diagram. A detailed study guide will be provided in advance, but no notes or handouts may be used during the test.

**A minimum percentage of 70% is required to receive a “Pass” for this class.**

## **Some Topics to be Covered in this Class**

How to read maps

Lines of Latitude and Longitude

Proofs of the shape of the Earth and of the rotation of the Earth

The Rock Cycle and different classes of rocks

Distinction between rocks and minerals

Glaciers and Glacial features

The nature and cause of the Driftless Area

The physical geography of Wisconsin, North America, and the World

Volcanoes and Earthquakes

Plate tectonics

Geological Time

Erosion and Weathering

The interior structure of the Earth

The source of the Earth's magnetic field

Pros and Cons of different map projections

GPS devices and topographic maps

Navigation tools and techniques used by ancient sailors

Karst geology and groundwater

And more!

