

## Map Projections

### Introduction

Students will develop their ability to analyze different visualizations through their study of different map projections. This activity may be either individual or collaborative, and does not require prior knowledge of different map features, such as longitude and latitude. In fact, this activity should precede the introduction of such features.

Students will use a data table to record the information they collect during their analysis on a data table. An avenue of differentiation may be identifying different qualities of the maps to compare, or not identifying any qualities at all, but rather letting students determine what data they will collect.

### Standard Indicators

- 7.3.2 Use different map projections and compare the way they represent the Eastern Hemisphere.
- 7.3.3 Use four spatial map elements (point, line, area, and volume) to interpret information on maps, globes, and Geographic Information Systems (GIS).

### Materials

*For the teacher:*

- Heterogeneous Grouping Data Table (if heterogeneous grouping is implemented in the lesson)
- Dry erase/chalk board or overhead projector

*For the students:*

- Students need access to a variety of map projections. Often, textbook resources may contain different map projections.
  - Map projections can be found on the internet, requiring student access. An example can be found at Java World Map Projections, available at <http://www.btinternet.com/~se16/js/mapproj.htm>
- BLM 1 Map Projection Data Table
- Ruler

### Activity

#### A. Activation of Prior Knowledge

1. Begin by asking students to identify different types of maps, for example, a road map. Record student responses on the board. Do not ask for elaboration.
2. Indicate to the students that there are many different types of map projections. Explain to the class that a map projection is a way to make a picture of a globe (a three-dimensional object) onto a piece of paper (a two-dimensional object).

#### B. Question Generation and Inquiry

1. If students are going to work collaboratively, have the students move into their respective groups. It can be helpful if students have predefined groups, identified prior to the lesson and used in preceding activities.
2. Identify the maps that students will be using today. These may be those available on the internet, in their textbook, or another source. Their task is to analyze different map projections, but first they must decide what data they are going to collect and record.

3. Hand each student BLM 1 Map Projection Data Table. Point out the label for the columns and the rows. At this point, students will either decide what data they will be collecting, or it may be identified for them. One possible type of data (if the map scale is the same for the different maps they are using), is to have the students measure a consistent North-South axis of a country located on the Equator, Greenland, and a country closer to the South Pole. Alternately, they may describe the three respective countries, the students' qualitative observations will be more difficult to compare. Each group/student should collect data about the same countries.
4. Students will collect the identified data. Each group (or individual) should collect data from at least three different map projections, recording their data onto BLM 1. Each group or student should gather data from the same map projections.

### **C. Assessment**

1. On the board or the overhead projector, copy the BLM 1. Have student representatives from each group come up and complete the data table. The rest of the class should compare the data being recorded for any anomalies.
2. Have the students answer the "Conclusion & Summary" questions on BLM 1. When the class appears to be ready to move on, discuss the answers to the questions. As the discussion continues, try to drive the students to the understanding that different map projections may be skewed due to the difficulty of projecting a three-dimensional object onto a two-dimensional object. Often, the projection will be skewed at the poles, such as on the Mercator projection.
3. Student learning can be assessed the next class period with the use of an "entrance card". On a ½ sheet of paper, ask the students to respond to the following question:  
**Why is there a need for different map projections? Explain your answer.**
4. The lesson ends on a point that can be a segue to introducing longitude and latitude, and how it is used on maps to mitigate the effect of projecting a three-dimensional Earth onto a two-dimensional medium.