

World Map Projection Activities

“Maps have uses; maps have limitations” – Deb Allen 7/11/07

Objectives:

- Students will see the connection between 3-D and 2-D projections of a world map
- See the limitations of a 2-D projection; how each attempt at a 2-D representation introduces some sort of error or compromise in visualization
- Review of using a world map to identify location

I. “Peeling the Earth”

A. Peeling the Orange Earth

1. Each student is given a washed and dried (very important) orange and a permanent marker (and a paper towel). They are instructed to draw a cute picture on their orange. Their picture should extend around the entire orange. Have them make a prediction of what their picture will look like when it is flattened onto a 2-D surface.
2. Allow the ink to dry. Have students wash their hands.
3. Once the ink is dry, have the students carefully peel their orange. Have the students try as much as possible to have the fewest number of pieces of peel when they are done. Place the peeled orange on a paper towel. Leave it aside to eat later. Note that the ink does rub off easily – tell the students to do their best to keep the ink on the orange and not on their hands.
4. The goal is to take the peel and lay it flat on a second paper towel. Have the students draw or what their flat picture looks like. With a contrasting color pen or marker, have them fill in the lines so there are no gaps in the picture.
5. Students get into groups. They should discuss what they observed. Compare and contrast their starting picture to the ending picture. Go back and see how distorted your “predicted” picture looks compared to your ending picture. Are there parts of the orange where the distortion is greater or less? For example, is there more distortion at the top or bottom than around the middle (or vice-versa)?

B. Looking at Different Projections

Show the students the difference between a globe and a map (Mercator projection)
Have them study the two representations. Do a compare and contrast. Point out specific locations and see how distorted they are or are not based on the two maps (e.g. Africa, Canada, Greenland, Antarctica). Which is a more accurate representation? Which is more useful/ easier to use in everyday life?

II. “Wrapping the Earth back up”

A. Wrapping the Earth

1. Give the students a 7” (or so) beach ball and a world map (probably would need to be on 3-4 sheets of paper taped together to be big enough to cover the ball).
2. Have them wrap the Earth up in the map so that it looks like a globe. Have them cut off any excess paper. There should be no extra paper tucked underneath or folded up. The only map left should be what is covering the beach ball. Tape the map carefully on the globe, but tape gently so that it can be removed intact later.
3. When they have covered their ball and they are satisfied that it looks roughly like a globe, have them carefully remove their map, untape or cut what they can so that it lays flat. When it is completely flat, mount it carefully on a piece of construction paper.
4. Discuss as a class what they observed. How was their map changed from their original flat map, in their efforts to make it fit the globe.

B. More on Different Projections

1. “Gallery Walk of Maps”. Put up as many different world maps of different projections as you get your hands on. Have the students walk around silently making note of the advantages and limitations of each map.
2. Class discussion about the different map projections.

III. Looking at Maps

After doing the map projection activities, this is a useful time to look at different types of maps and their uses (geologic, vegetation, population, political, etc.)

A useful activity would be to put up several different versions of a world map with different emphases. Have a “Gallery Walk” where students place sticky notes on the maps showing what they think one can learn from these different maps.