Perrella & Hardy
11/29/2007

HU GK-12 Activity

TITLE: Characterizing Biomes

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DCPS STANDARDS: E.3.9

GOALS:

1. Scholars will be able to locate, identify and explain the role of desert and tundra biomes and discuss how abiotic and biotic factors interact within these ecosystems.
2. Scholars will be able to locate, identify and explain the role of grassland biomes and discuss how abiotic and biotic factors interact within these ecosystems.
3. Scholars will be able to locate, identify and explain the role of deciduous and coniferous forest biomes (including taiga) and discuss how abiotic and biotic factors interact within these ecosystems.
4. Students will be able to locate, identify and explain the role of the rainforest biome and discuss how abiotic and biotic factors interact within this ecosystem.

OBJECTIVES:

1. Given climatic data for six major biome locations, scholars will construct a climatogram for each location.
2. Through making comparisons of the six climatograms, scholars will make predictions on the types of organisms they expect to find in each of the six biomes.

PREREQUISITE KNOWLEDGE:
Background

The cycle of nutrients and flow of energy are common to all ecosystems on Earth. Climate however varies in the diverse environments of Earth. The terrestrial areas of Earth range from the ice of Antarctica to the heat and rain of the Amazon. Variations in temperature and precipitation create a vast array of conditions on the surface of Earth. Though some of these environments seem inhospitable to life, organisms have adapted and thrived in almost all of these environments. Each ecosystem on Earth is divided into several broad categories based on climate and the types of plant life present. A major type of ecosystem with distinctive temperature, rainfall, and organisms is called a biome. Biomes may be either terrestrial or aquatic. The type of biomes on land is classified through the documentation of the average temperature and precipitation. The biome is the largest category scientists use to classify ecosystems and because each is a general category, the conditions within biomes may vary form place to place. The terrestrial ecosystems of Earth can be divided into eight major biomes, which include *desert*, *tundra*, *coniferous forest*, *deciduous forest*, *rain forest*, *steppes*, *prairies*, and *savannas*.

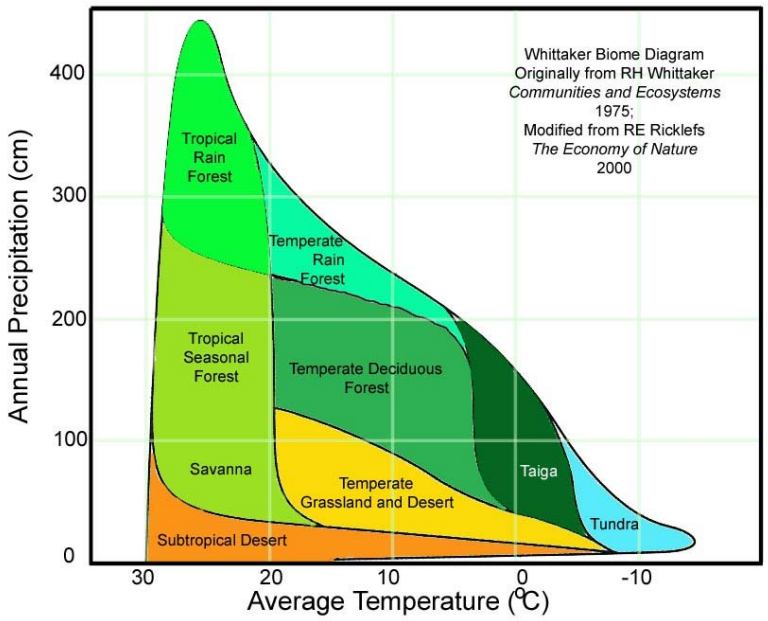

Figure 1. Whittaker Biome Diagram.

ESSENTIAL QUESTIONS:

1. What causes climate to vary among different biomes?
2. What are the advantages of constructing climatograms compared to studying the same data from tables?
3. How do the differences in climate affect the kind of plants and animals found in two of these biomes?

LABORATORY MATERIALS:

Graph paper, temperature and precipitation data for cities in six different biomes, and colored pencils.

DIFFERENTIATING INSTRUCTION:

English language limited scholars will be paired with bilingual scholars for this activity. Learning disabled scholars will be complete one graph/analysis per group of three.

RATIONALE:

This activity is designed to promote an understanding of the biological relationships that constitute the diversity of terrestrial and aquatic biotic communities.

RESEARCH ACTIVITY:

1. Using average temperature data, plot the average temperature for data from six cities. Connect the points of the *line* graph.
2. Using annual precipitation data, plot the average amount of rainfall received per month. Shade in the area using a *bar* graph format.
3. Compare climatorgrams for the six major biomes.

EVALUATION AND ASSESMENT:

1. Scholars will create a climatogram for six of Earth's terrestrial biomes and describe their locations.
2. Scholars will describe in two paragraphs how interactions between abiotic and biotic factors in their home biome influence the types of plant and animal life they observe.

REFERENCES

Whittaker, 1975. R.H. Whittaker In: Communities and Ecosystems, Macmillan, New York (1975), p. 387.