A STUDY OF BIOMES

http://bellnetweb.brc.tamus.edu/res_grid/biomes.htm

A HIGH SCHOOL BIOLOGY / ECOLOGY MODULE

Summary:

In this module the students will research and illustrate the different biomes of the world.

Connection to the Curriculum:

The students will work independently and cooperatively to research the interdependence of biotic and abiotic factors within an ecosystem. The students will then express their research by designing an illustration of various biomes.

Time:

This module should take approximately a week.

Season:

This module may be used at any time throughout the year.

Materials:

For biome mural

* large sheet of butcher paper per group.
* world map
* color pencils
* markers
* scissors
* glue

Students work sheets

* vocabulary list
* student notes
* biome project handouts
* world map picture for mural

Apple Demo

* one large apple mural
* sharp knife
Objectives:

* Students will be able to (SWBAT)- work independently and cooperatively to conduct research on various Biomes.
* SWBAT- describe a biome by creating an illustration and the interactions between organisms of their biome.
* SWBAT- describe and illustrate the different types of plants and animal life present in their Biome.

Procedures:

1. Before introduction of the mural project, Do the Apple Demonstration, to give the students a visual example of the proportions of the earth.

   a. Hold up the apple and tell the students that the apple represents planet earth.

   b. Ask the students what portion of the earth they think provides habitat for humans and other land-dwelling animals?

   c. Answers will vary, spend a few minutes discussing the students hypothesis.

   d. 70 to 75% of the earth is covered by oceans.

   e. Cut the apple into fourths and remove three of the pieces, leaving only one-fourth of the apple in your hand.

   f. About 25 to 30% of the fourth in your hand is desert, too dry to live on (cut off a little less than a third, leaving a little more than two-thirds of the apple quarter)

   g. Another 25 to 30% is mountains, too cold, high and steep to live on (cut off another piece, leaving about 40% of the apple quarter)

   h. The remaining portion, the surface (skin) is used primarily as living space for humans and other land-dwelling animals (trim the skin from the small piece of the apple). The thin layer of a apple attached to the skin represents our underground use.

   i. Discuss with the students the pieces of the apple that you cut away. The pieces you discarded represented the oceans, deserts, and mountains. You can discuss why these areas (Biomes) are inhabitable for humans, have the students name some type of plant and animal life that might be present in these biomes

   j. Expanding the lesson- the concepts of land resources, carrying capacity, and fractions could be brought into the lesson.

2. Introduce Biome Mural Project (step one)
* students will work as teams to illustrate different biomes. (may use the internet, if not available to students use the library or bring resources into the class room for the students to use.)
* you may assign the team a biome, let them draw from the hat,
* let them pick the biome they want to research, or any other method you are comfortable with in the assigning of biomes.
* each group will research the abiotic (non-living) characteristics of their biome.
* each group will research vegetative characteristics of their biome. (types of Plants)
* each group will translate the information artistically onto the mural.
* have the teams also research the varies a food chains/food web that are present in their biome.

The Rules:

* do not let them alter the size of the paper.
* everything must be colored.
* a small world map will be placed in the lower right corner and the biome will be highlighted that the team is researching. (Make sure they include the key).
* climatic factors that characterize each biome must be illustrated.
* example- Tundra could be illustrated by ice and snow covered land - small vegetation such as mosses and lichens.
* the physical characteristics are to be listed just above the world map.
* the mural will form a background for the animals that will be added later as the animals are studied. After the murals are completed each group will present their mural to the entire class explaining the biome.

3. Biome Mural Project (step two)

* working in their original biome team, the students will now
* research animals that are present in their biome.
* each group will place at least five different Phylum/Sub-Phyla of organisms on its appropriate location on the mural. (you can be flexible here, you just do not want 5 mammals, you want the end product to have a diversity of wildlife).
* organisms can be drawn on a separate piece of paper, colored cut out and glued onto the mural. Alternative- students may cut pictures from a magazines and place it on the mural.
* upon completion of the mural, each group will present their murals to the entire class. They will need to explain the biome along with the plant type and animal they were assigned.

4. Biome Mural Project (step three)

* a. Each student will do an individual report on one of the animals present in their biome.
The Rules:

1. no two students can report on the same phylum of animal.
2. animals should be approved by the teacher.
3. the final report will be an oral presentation.
4. presentation of individual reports are to be given at the same time as the group makes their group biome mural presentation.

** Topics to be included in the animal reports (these are suggestions, you may want to include some of your own)

1. classification of the animal.
2. scientific name of the animal.
3. where does the animal live within the biome (it’s niche).
4. how does the animal reproduce? eg. sexually/asexually internal/external fertilization?
5. how does the animal give birth? viviparous, oviparous, or ovoviviparous.
6. how many young can the animal have?
7. how does the animal care for it’s young/does it care for it’s young?
8. does the animal have any special adaptations?
9. does the animal have any type of camouflage?
10. where does the animal fit into the food chain with in it’s biome? (what does it feed upon and what eats it?)
11. construct a simple food web which your animal is apart of.
12. what it the life span of the animal?
13. name any medical use for you animal
14. the reports should be three to five minutes.

Background:

Biomes are large geographic areas that have the same climate and life forms. Abiotic (non-living) factors of a biome determines what plants will grow in an area and in turn determine the types of animals found in that area. Abiotic factors include temperature, light intensity, patterns of rainfall and availability of water.

Suggested but not limited to....biomes to be researched by students may include:

* Desert
* Savanna
* Deciduous Forest
* Coniferous Forest
* Tropical Rain Forest
* Wetlands
I suggest that Tundra not be offered as a choice to the students. (There just isn’t a lot to illustrate in this biome) Use the Tundra as your example in describing to the students what type of things to look for while doing their research. Notes to your students might look something like:

**TUNDRA**

**Characteristics**

* cold regions (crest of the Rockies and the north pole)
* vegetation grows close to the ground
* cold-Dry Climate
* long winters - short summers

**Common Plant Form**

* lichens
* mosses
* other small plants

**Animals**

* polar bears • Musk ox
* caribou • Reindeer
* arctic Foxes • Arctic Hares
* small Rodents (Lemmings)

**Some Suggested Research Sites:**

**The Living Planet Campaign**

At this site you will find a interactive endangered species map, the site also takes on several other conservation issues. One of the screens is called priority Biomes: at this site you will find descriptions of forest, fresh water, and oceans coast ecosystems. If you would like to go directly to this site click here:

**Ecology Explorations - Biome of the World** This is a must see web site! There is too much here to try and describe, you just have to see it for yourself. I will tell you that the first screen offers some lesson plans and activities that can be done using the site.

**Dragonfly** is another excellent site to use when studying our earth. Lots of activities here. You must also try the hot links button!

**Access Excellence** This is a good all around science web site, you should bookmark it and check it out.
Amazing Environmental Organization Web Directory This site is a clearing house for tons and tons of links which deals with environmental issues.

I give all of these sites four paws up:

Expanding the Lesson: An excellent expansion of the biome project is an activity from Project Wild / Aquatic called Dragonfly Pond. The major purpose of this activity is to encourage students to wrestle with environmental and management decisions concerning a wetland habitat. Students are to design a town, where residents, industry and nature must co-exist.

Resources:


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