

<b>Lesson Title: What is a Biome?</b>	
Grade Level: 9-12	Subject Area: Environmental Science
Genevieve Dierenga, Wooster High School. Lesson will employ inquiry and guided inquiry elements along with a 5E model approach. It can be modified for middle school science classrooms.	Lesson Length: introduction - about 1 class period. Research and biome construction 4 class periods. Presentation 1-3 class periods depending on length of presentations and number of groups.

## The Teaching Process

<b>Lesson Overview</b> This is an introductory lesson to the concept of Biomes
<b>Unit Objectives:</b> Students will understand that various areas of the planet can be categorized into groups called biomes. They will then study these biomes in more depth.
Standards addressed: MS-ESS3-1,MS-ESS3-d
<b>List of Materials</b> Various plants - preferably from different areas or biomes. For example a cactus, a fern, a flowering plant and a conifer. Students could bring in plants from home or investigate plants that are found on the school grounds if applicable. Also pictures of many types of plants will be needed. Library or computer lab could be used for research. Building dioramas will require a box for each group and various creative materials such as markers, pencils, paper, scissors, glue and any other materials that inspire students to create a visual representation of the biome they will build.

## Instructional Sequence

<b>Phase One: Engage the Learner</b>	
Students often enjoy talking about themselves. Students will share about where they have been or where they want to go on a "dream vacation" by drawing a quick representation of a chosen location. Then the teacher and students discuss the similarities and differences found in the drawings. What kinds of plants did they draw? What types of animals? Some students may even use Biome names in the discussion – if so this should be pointed out as a great way to describe the location.	
What is the teacher doing? Teacher asks students to draw a picture of either their favorite place they have been or the place they would like to visit on a dream vacation. Emphasizing the plant life and animal life they either have seen or will see.	What are the students doing? Students are drawing (a time limit maybe given) a picture that should include plants and animals. Various locations should be represented by the class.



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## Phase Two: Explore the Concept

Students will categorize plants and animals into groups.

What is the teacher doing?

Teacher supplies the students with various real plants as well as many color pictures of plants and animals. Teacher allows students to sort these into whatever groups make sense to the students but guides students to sort based on meaningful physical structures...not based on criteria such as how much they like the picture or if they have seen this in person before.

What are the students doing?

Students are sorting the plants and animals into groups. They can choose how to sort but have guidelines that include physical structures that are common among the items being sorted.

## Phase Three: Explain the concept and define terms

The Biomes are named and defined. The teacher offers real examples that may include actual plants, pictures of biomes or video clips from various biomes. Pictures from Biosphere 2 could be used to illustrate how the study of biomes and their inter connectivity is beneficial on many levels. As students and teacher define the biomes students may resort their pictures and plants based on the common Biome types.

What is the teacher doing?

The teacher defines and explains what a biome is and uses the actual names of the biomes. The teacher uses the groupings the students made and where applicable explains what groups are really called and how these groups are defined by environmental scientists.

What are the students doing?

Students are taking notes and are defining the groups they previously constructed. Where applicable they may move the pictures of plants and animals around to create new groupings that are more accurate based on the predetermined groups agreed upon by environmental scientists.(biomes) Students may watch video clips from Biosphere 2 or from various movies available that teach about biomes in order to gain a more accurate mental picture of each Biome. You Tube is also a source of video clips.



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## Phase Four: Elaborate the Concept

Students elaborate on their understanding of the concepts of biomes. They will get into groups. Each group will be responsible for researching a specific biome. The group will construct a diorama of the biome and then they will present it to the class. The requirements for each biome should be very specific so that students know what is expected. For example guidelines should include the number of producers, consumers and decomposers represented in the diorama.

What is the teacher doing?

Teacher monitors each group making sure they are on the right track. Each group will be responsible for a biome so all groups must participate. The teacher will make sure each group does not incorporate misinformation into their presentation. The teacher will confirm that critical correct information is also included.

What are the students doing?

Research and construction of the biome diorama should be carried out by all of the members of the group. Students that are not fully participating should be given specific responsibilities and should be held accountable. Students will physically construct a Biome in a box. They will need to color, cut, paste etc. in order to make the box appear as close to the actual biome as is possible.



## Phase Five: Evaluate Students' Understanding of Concept

The final stage of the unit has a dual purpose. Students will present their findings as a group to the class. Classmates will evaluate each other's thoroughness of presentation. Specific guiding questions should be used to guide students as to what to look for. Examples of this include: What producers are found in this biome? How fast is the rate of decomposition?

The teacher will use this time to evaluate each group's understanding of the biome they were assigned.



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<p>What is the teacher doing?</p> <p>Listening to each presentation and evaluating each group based on the specific guidelines given.</p>	<p>What are the students doing?</p> <p>Listening to each presentation and answering questions or evaluating their classmates as they present. Active listening is important during this step so that students finish this activity with knowledge of all biomes, not just the biome they researched and constructed.</p>
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Inquiries and comments regarding this lesson can be directed to Genevieve Dierenga, Wooster High School, 1331 E Plumb Lane, Reno, NV 89502 or by e-mail: Genevieve Dierenga< GDierenga@washoeschools.net>



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