

Constructivist Lesson Plan Form

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Introduction: This lesson on biomes is designed to stimulate the interest of high school biology students to discover the diversity of ecological regions around the globe. Students are given a basic list of requirements to learn about each biome, a visual presentation requirement, and a written component that incorporates the development of a creative story to present the key facts. Through the research of their particular biome, the sharing of information, the creation of a fun story, and the development of a final presentation, students will learn about the requirements of each region. They will be able to examine the impact of change on a particular region. They will be able to extrapolate the potential outcomes of future changes on the global community. And finally, they will be producing a video that may be shared with the elementary schools to educate other students of their findings.

Standards (Performance, Knowledge and NETS-S):
ME Science B3. Analyze the factors that affect population size. ME Science B4. Analyze the impact of human and other activities on the type and pace of change in ecosystems. ME English G2. Write pieces and deliver oral presentations that effectively use descriptive language to clarify, enhance, and develop ideas. Grade 9-12 NETS-S 5. Use technology tools and resources for managing and communicating personal/professional information. (3, 4) Grade 9-12 NETS-S 7. Routinely and efficiently use online information resources to meet needs for collaboration, research, publication, communication, and productivity. (4, 5, 6)
What concepts do you want students to understand after completing this lesson?
Students will be able to determine the differences between biomes, understand adaptations of flora and fauna needed for survival in the different biomes, understand what affect changes may have on a biome, be able to produce a product using technology to educate others on a particular topic.
Essential Question:
Why are there different environments and do those differences affect life?
Criteria for Success (How will you know students have gained the understanding of the concepts?):
Students will be graded on their ability to convey the important concepts in their biomes to their peers and on the quality of the final products produced. They will also be tested on the material that is provided to determine how well they paid attention during their peers' presentations.
Resources (What resources will you and your students use?):

Students will use the Internet, Textbooks, Video Camera, Smartboard, Computers, MS PowerPoint, and iMovie.

Management (How will students share technology resources? How will you break up the lesson into segments-the number of hours or days?)

Students will be broken into pairs to research and develop their presentations for individual biomes. They will need to pool their information as they progress to allow the final product to flow smoothly and the story-line to make sense. Students will be given 4 class days to work cooperatively on their projects. They will be responsible for dividing the material between the pairs to allow them to take advantage of personal strengths. This will allow the special needs students in the group to participate without feeling unable to contribute. They will be able to incorporate their strengths. The partners were picked by random draw.

Learner Diversity (What diverse learner needs do you need to consider when selecting resources, grouping students or planning the culminating project? Are there any special considerations such as assistive technologies or second-language learning to take into account?)

- ✓ Students are given a variety of resource texts and the Internet to overcome varied levels.
- ✓ Students are given the option of developing a final product that they choose to present their biomes. They may create a PP, video, song, sculpture, or any creative visual of their choosing.
- ✓ Students are working in pairs to allow them to develop the creative story component that accompanies their visual. They may use audio or script to submit their stories.
- ✓ This grouping does not have ESL issues or assistive technology requirements, but all students have the opportunity to use audio or Dragon Naturally Speaking, a speech to text program, if necessary.
- ✓ Students have training using web searches to find information for a particular topic.
- ✓ Students are familiar with word processing, MS PowerPoint, and other presentation programs.
- ✓ Students will be trained in the use of iMovie if necessary to produce a fluid product. This will be a collective effort using the Smartboard. This step will be to integrate the different materials of various groups into a single product.

Engage:

Capture the students' attention, stimulate their thinking and help them access prior knowledge.

- ✓ Students just completed a lab on Paramecium and Didinium examining the requirements for successful living in an ecosystem.
- ✓ The biome lesson was initiated with a discussion of the lab and the requirements they personally have for survival.

Explore:

Give students time to think, plan, investigate and organize collected information.

- ✓ Students will perform Internet searches and text searches to gather the required information to complete the project.
- ✓ Students were required to create a graphic organizer, outline, or other means to share information between groups. They have the option of choosing the method that works best for them. However, they must coordinate this with all groups. They must spend additional time understanding what the groups immediately before and after them in the final presentation order are doing. This will allow them to integrate components of the other groups work into their projects for smooth transitions.

Explain:

Involve students in an analysis of their explorations. Use reflective activities to clarify and modify their understanding.

- ✓ Students will collaborate with other groups to ensure that the information meets the requirements of the activity.
- ✓ Students will do peer evaluations of drafts and presentations prior to the final video production. The results will be discussed in open forums to enable all groups to profit from the constructive criticism.

Elaborate:

Give students the opportunity to expand and solidify their understanding of the concept and/or apply it to a real-world situation.

Students will be undertaking a debate on the impact of global change on their region after this project is complete. The debate follows a recent journal publication that found that the Northeast could be subjected to a 3 feet rise in sea-level in the next 50 years and up to 10 feet. The article is not one of my favorites for content, but its recent printing and regional significance should allow it to be a focus for debate. The fact that it has some flaws will actually lend itself to the debate forum.

Evaluate:

Evaluate throughout the lesson. Present students with a scoring guide at the beginning. Scoring tools developed by teachers (sometimes with student involvement) target what students must know and do. Consistent use of scoring tools can improve learning.

- ✓ The scoring for the presentations and project will follow the school's set rubrics for presentations, projects, and written assignments. These rubrics grade on participation, content, and quality.
- ✓ Specific project requirements were given to the students at the start of the project that must be included to focus their research.
- ✓ Students will be evaluating the work of their peers as they present. As part of the evaluation, they will be required to take notes to study for a test on all of the material. So, it is important that they be a critical audience and ask the questions needed to obtain all of the required information for success on the exam.
- ✓ I know that the project should be enough, but to overcome the time requirement necessary to fully research all of the different biomes, students are going to assume the role of instructor for their particular topic. To ensure that they learn what their peers present, I am using an exam.

The eMINTS staff has adapted this form from materials available at this website:
<http://www.mdk12.org/instruction/curriculum/science/5emodel.html>.

Reflection: Research in the science classroom at the high school level is expected; however, it requires the students to have instruction on how to perform successful searches for information. As libraries become more obsolete because of funding, the computer is taking over. Students are being required to either follow a set of predetermined links or understand how to mine the Internet for appropriate material. I prefer to train them to do the latter since that is the skill necessary out of the classroom. That is the largest challenge to research with low level readers. I work to overcome some difficulties by offering suggestions on search terms and methods to limit results rather than providing links ahead.

The overall incorporation of technology is becoming more simplistic as computers become more available. Students are less inclined to opt for standard posters and paper products as they become more adept at utilizing the resource. The biome activity that the lesson discusses has been done for a few years now. Each year it progresses to something new at the discretion of the students in the particular course. At the onset of the lesson, I present the basic requirements and allow the students to brainstorm on how to progress to a final product. This year, the students were familiar with the dioramas produced by last year's students. Almost without fail, they began to mimic what they had seen from the prior year. However, as always seems to happen with this project, they progress quickly to something new and exciting. Do to some unforeseen scheduling changes, the project is not yet completed, but the students are working towards a puppet show. They were going to develop dioramas as backgrounds. Then, they progressed to using the computers to develop backgrounds and the Smartboard. They will perform the puppet show in front of the screen with the entire program being video taped. I enjoy this project because the students take over. They have a lot of freedom of choice in the final product and even though some complain throughout, they generally all produce some of the highest quality. Each year, the project is new and the incorporation of technology into the final product rather than just as a tool to discover material. The biggest challenge is to ensure that each student has an opportunity to engage. By breaking into smaller groups this year, there seems to be a greater level of equality. This project will hopefully continue to progress and I anticipate letting the students do the modifications with me enjoying the ride.