

You say you want environmental education...(25 points)

In response to the overwhelming amount of you that want to include environmental education into our education system as a whole, you are being asked to create a 2 lesson mini-unit on your topic. Keep in mind this is also helping you (notice I said helping, not this is all you have to do) to prepare for the APES exam on Monday, May 2nd. This process is meant to distill the vast amount of information you have learned into the most important parts you want your younger comrades to know and apply in their lives. You know what is at stake if the greater public remains ignorant of environmental issues.

In terms of your grade, I am looking for you to demonstrate environmental science expertise to develop an understanding in an elementary or middle school student. Please use the activities we have done to inform your lesson plan ideas. Your presentation should be about 5-10 minutes long. At this time you will share your enduring understandings and how you will teach them to the students. Please see Ms. Leigh's plans as an example. The schedule can be found at the bottom of the page.

Your lessons must include the following:

Enduring Understandings for the mini-unit, this is the one or two things you want the students to remember if they remember nothing else.

Learning goals are the goals for that individual lesson. These should be very similar to the enduring understanding.

Learning Plan: This is a synopsis of what you are going to do to achieve the learning goal. Don't get lost in the details, just summarize. If it is a lab we did in class, you can skip all the little details and just explain how you will open and close the lab to get the learning across to your students.

Younger students like more entertaining lessons. Skits, games, activities, hands-on experience, and movement are encouraged.

Formative Assessment: What are you going to look for to know that the students learned what you were trying to teach them?

Materials: What do you need to make the magic happen for your "students"?

Presentation Schedule:

- Tuesday: Ms. Leigh (Living World), Walter, Shawnea, and Amanda (earth Systems and Resources)
- Wednesday: Deja/Chidera (Population), Fauzia/Bernadette/Erica (Land and Water use), Pre/Jennifer Ruiz/Sena (energy resources and consumption)
- Thursday: Ethan/Alondra/Jennifer Martinez (pollution) and Alejandro/Jose/Abdi (Global Change)

The Living World 2 Day Mini-Unit

Enduring Understandings:

- Resources are limited
- Climate determines the biome
- Energy Flows and Matter Cycles

Lesson One

Learning Goals:

I can create a climate graph and explain how precipitation and temperature influence plant life.

Learning Plan:

Each table group should have the following at their table: graph paper, rulers, pictures of their ecosystems with the animals, and climate data.

Teacher will begin by asking the students to examine their ecosystem pictures and hypothesize what the temperature and precipitation is for their ecosystem. Guiding questions: What months does it snow or rain? What can the plants tell you about how much precipitation there is in the ecosystem? What can the animals tell you about the temperatures throughout the year? What are their adaptations that tell you this? Students work with their groups to develop a hypothesis.

Once the students have a clear hypothesis, the teacher will explain how to make a climatogram. For younger students, two separate graphs may be needed (one for precipitation and one for temperature). Students will then work with their table group to create their climatogram.

Students will then compare their hypothesis with the graph demonstrating their ecosystem's climate. Students will take one plant from their ecosystem and describe how the abiotic factors are influencing the adaptations. At the end of class they will turn in (individually or with a partner) a graph and an explanation of the abiotic factors and how they impact plant life.

Formative Assessment:

Students will submit their climate graph and explanation of the effects of precipitation and temperature on plant life. Teachers will also check for understanding as they create their climate graphs.

Materials:

Graph paper, climate data (average temperatures and average precipitation for each month) from various global ecosystems (ideally a desert, rainforest, tundra, and grasslands), rulers, images of the ecosystem and the biotic inhabitants.

Lesson Two

Learning Goals:

- I can build a food web in a given ecosystem that starts with the sun and ends with decomposers.
- I can explain why a food pyramid demonstrates that energy flow.
- I can explain how matter cycles through an ecosystem.

Learning Plan:

Teacher will explain how to create a food web and what the arrows symbolize. Special attention given to the food webs being, web like and not always organized. Students will use the same ecosystem they studied yesterday to create their food webs.

Once the students have their web created the teacher will ask the student to pull out the food chains as they begin at the sun and end in decomposers. With the food chains the web as a whole can be transferred to the food pyramid with plants on the bottom and the chain progressing up the levels of the pyramid.

Pose the following questions to the students: Where does the energy come from to feed the animal at the top of your pyramid? What about the plants at the bottom? How does the energy move in this ecosystem? Hypothesize how much energy moves up each level. Let them struggle with the questions and develop explanations.

Explain to the students how energy travels to the earth from the sun and is used by plants then, flows from one trophic level to the next. Have the students figure out on their own the answer to the following: Why are there so few animals at the top and so many at the bottom?

Take students outside to observe the local animals and ecosystem. Have them work in pairs to draw a food web. In an ideal world you would see all the trophic levels. In the real world, the teacher may have to help the students imagine.

Formative Assessment:

Students will turn in their food web, the food pyramid, and their written explanation of the following statement: "energy flows and matter cycles".

Materials:

Use the same picture of the ecosystem and animals as used in the previous lesson, a blank food pyramid.

The Decomposition Lab should go on concurrently to this unit to support the understanding of matter cycling and the process of decomposition.