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Background Knowledge

1. EM spectrum
2. radiation reflected (how and why)
3. layers of the atmosphere
4. General Atmospheric information

Activity

Warm Up

Start with a K-W-L sheet like the one provided below.

What do you know about your atmosphere?	What do you want to know about your atmosphere?	What have you learned about your atmosphere?

Have the students fill in the first two columns with their general knowledge. Then, break them into groups of two. Put the following questions on the board. Have the students discuss the answers and write them in the first column of the K-W-L Sheet. Collect the sheet (it will be given back to them after the activity to fill in the last column).

1. What molecules, in the atmosphere, block radiation from the sun from hitting the Earth?
2. What types of radiation gets blocked by the atmosphere?
3. Why is it important for life on Earth that the harmful types of radiation get blocked?

Activity:

I. Break the class up into groups of two or three. Each group will go through the following Web Quest (in the form of a power point presentation) to gain knowledge of the topic. Each group is responsible for answering the questions found within the presentation. The order of this part of the lesson is layed out below.

- A) Students complete web quest
- B) Students and Teacher go over answers to Web Quest in an open discussion forum
- C) Students are encouraged to ask any questions that they feel necessary.

II. Compare Earth, Venus, and Mars

A. Divide the class into teams of three or four. Each team is to be assigned at least one item of data from the following data charts (the amount of items will depend on how many teams there are in the class.) As the teams research their items and find the answers, they are to fill in a class (wall size) poster board data sheet with the correct information.

Characteristic	VENUS	EARTH	MARS
Average temperature			
Average precipitation			
Average wind speed			
Number of daylight hours each day			
Number of days in a year			
Oxygen levels in atmosphere			
Carbon dioxide levels in atmosphere			
Amount of methane, nitrogen, water vapor, and hydrogen gases in atmosphere			
Amount of visible light hitting planet's surface			
Average amount of cloud cover			
Average gravitational pull			
Average depth of atmospheric gases			

B. After the data sheet is filled out, discuss with the class the similarities and differences between the three planets' atmospheric conditions. Make sure to discuss how the atmospheric conditions would affect life (if there was any) on the different planets. You can also discuss ways that the information was gathered and ways to use this information.

C. Project

- students should work alone but can work in teams or groups depending on the class structure

- the project is spelled out below
- when finished the students will present their ideas to the class and the projects can be displayed for the class to view through the week

III. Closure

1. Give the students back their K-W-L sheets. Have them fill out the last column alone and quietly.
2. Ask the students to share their last column one at a time.
3. Discuss any problems or concerns
4. Test or quiz is optional for the teacher (depending on time and class)

Name _____

VENUS AND MARS PROJECT

You are a scientist working on the first land based outpost on Mars OR Venus. Choose the planet that you would like to be on and complete the following activities.

1. Create a detailed and labeled drawing (on a poster board) of your outpost. Remember that you are on a planet with very different water, temperature, and atmospheric conditions from Earth. Your drawing must include the structures or devices that you will use to get around all of the differences and make it inhabitable by humans.
2. You will need to create a three paged (typed) explanation of your drawing and your ideas to get around all of the differences between your planet and Earth.
3. Suppose you encountered a native living thing that lived on the planet. Describe what it would look like, how it would get food, how it would reproduce, how would it move (does it move?), how does it see, what kind of senses does it have, and how it would breathe. How would humans interact with this living creature? You must draw a detailed and labeled drawing of your organism and include a one page (typed) description of it.

Rubrics
Written Reports

Grade	Reason
4	Good grammar, very detailed descriptions, uses all correct science terms and concepts
3	Good grammar, somewhat detailed descriptions, made 1-3 mistakes on science terms and concepts
2	OK grammar, few details in the descriptions, made 4-8 mistakes on science terms and concepts
1	Mostly incorrect grammar, no details, made numerous mistakes on science terms and concepts

Drawings

Grade	Reason
4	Detailed drawings, completely labeled, colored, neat
3	Mostly detailed drawings, missed 1-3 labels, colored, mostly neat
2	Almost no detail to drawings, 3-7 missed labels, not colored
1	Very little detail, few labels, not colored