THE TECHNO RAIN FOREST

by
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Level: middle school
Course: science

Rationale

The purpose of "The Techno Rainforest" is to teach students how to access information using the latest technology locator, the Internet and other media. Students will learn how to compile the information in a data base and present important findings in a slide show presentation format. These are technology skills needed for the present and the future. Students will also learn about rainforests around the world in cooperative groups while researching a rainforest topic of their choosing.

Lesson Overview

Through interactive hands-on discovery labs, students will learn about how a rainforest grows, how birds and animals camouflage themselves, and simulate the greenhouse effect in regards to global warming.

After posting their information on the data base, students can place information on-line, on a World Wide Web home page so other students can locate information on the Internet about the rainforests.

Outline for Discovery

Lesson 1: Rainforest Discovery
Lesson 2,3,4,5: Information Highway

Project Goals

1. The students will learn how to research, analyze, sort, compile, and present data regarding rainforest s worldwide using the Internet, CD-ROM, Video disk, TV, radio, computer simulations, and computer multi-media software. Students will communicate globally using E-Mail.

2. Students will perform interactive hands-on discovery science labs related to the environment, biology, zoology, botany, weather, geology of the rainforests interact and how many of the elements are endangered.

3. Students will use technology tools and science information to create a rainforest data base and Clarisworks slide show presentation.

4. In cooperation with the art teacher, students will draw/paint a mural of a rainforest depicting species they had researched.

Time Needed

This is a three-to-four-to-six week unit lesson plan. Each class period is 45 minutes long. Many lessons will take more than one day to complete.

Materials

Materials are specific to the lesson. AppleII e's, 286 IBM's, and Macintosh LC III's, 575 and 580's will be used for the project, with Clarisworks software, Internet programs such as gopher, Netscape and E-Mail.

Evaluation

Students using the data base will be able to use peer evaluation on the value of ease and locating items in the data base. Students may evaluate the value of learning through technology media using a 5 point Liekert scale evaluation survey. Other teachers will be able to evaluate the students work on the data base and mural.

Students will be required to complete lab worksheets following the scientific method at the end of each interactive hands-on discovery lab which will have already been introduced to the students.

Lesson One: Rainforest Discovery

Goals

Using "Mushroom Management" as a curriculum methodology, students will be introduced to the unit or (put in the dark) using the National Geographic Film entitled "Rainforest".

Objectives

1. While watching the film, students will create a web on a piece of paper of as many of the species in the rainforest they see or hear about in the film.
2. While watching the film, students will list at least 5 questions they have about the rainforests.
3. Students will discuss the species and question in group discussions.
4. Students will choose a group to work in and choose a rainforest species to research.
5. Introduction to the unit will be delivered via "air-mail" (unit written on paper air plane launched by neighboring teacher.) from the fictious "Rainforest Research Inc." See attached sheet.
6. While reading the "letter", water or rainforest music is played quietly in the background.

Materials

1. National Geographic video: "Rainforests"
2. TV and VCR player
3. paper
4. pencil /pen
5. letter from the "Rainforest Research Inc."
6. recording of rainforest music

Procedures

1. Students will form cooperative learning groups with 2-4 members.

2. Students will have a piece of paper and pencil ready.

3. As students watch the film "Rainforests," students will create a web of species in the forest they are introduced to in the film.

4. Students will list at least 5 questions they have regarding the rainforest.

5. Students will discuss the film and their questions.

6. The "air-mail" letter will float into the class and the teacher will read it.

7. An invitation to do rainforest research are given. Also the expectations of the project are read and followed by the students on copies of their own letter.

8. Students will discuss and decide what species in the rainforests they want to explore.

Evaluation

1. Are students in cooperative groups?
2. Did students select a species to research?
3. Did students complete the assignment?

Handout: Rainforest Research Inc.

Buenos Dias,

Greetings from Rainforest Research Inc. We have been working very hard in all areas of scientific research examining every tree and plant, biological habitat, food and medicine resource, climate and results of ecological balance and the imbalance in the rainforest and the Earth. This has been an exciting adventure and we ask you to join us. Yes, it is limiting to not be able to actually be here in Costa Rica, but there are many things that you could do in your classes that would help in our investigations regarding the rainforests of the world.

If you accept this challenge, we ask you to research one of the rainforests around the world. The following is the list of expectations for this adventure:

1. Using the Internet, you will collect data to send us for further research. You will get information on the computer through Gopher, the World Wide Web, CD ROM and the library.
2. You will do hands-on science labs where you will discover: how plants might grow in the rainforest, what kinds of animals live in the rainforest, what kinds of medicines have been extracted from the trees and plants of the rainforest, how all the living biomes interact with each other, how the logging industry hurts the rainforest, and why the rainforests are important to the rest of the world.
3. You will learn the Amazon Trail simulation game and use strategies you will discuss in Language Arts and Social Studies. This will help you determine how you might save the rainforest.
4. You will create a slide show on Clarisworks to present your findings about the rainforest. You will show your slide show to the entire class.
5. You will discover what appropriate action might be taken to preserve the rainforest and find a way for your school to help.

Lessons 2,3,4,5: Information Highway

Goals

The students will learn how to access information for their research using the Internet, CD ROM, Video Disk and Netscape.

Objectives

1. Using a computer and modem, students will learn how to access the Internet and locate at least five "scavenger hunt" inquiries about the rainforest using Gopher.
2. Using a computer and modem, students will learn how to access the Internet and locate at least five "scavenger hunt" inquiries about the rainforest using Netscape.
3. Using a computer and CD ROM encyclopedia program, students will learn how to research CD ROM information and locate at least five "scavenger hunt" inquiries.
4. Using a video-disk player, students will learn how to locate information and will locate at least five "scavenger hunt" inquiries.

Materials

1. 30 Macintosh computers with modems.
2. 15 Macintosh computers with CD ROM.
3. 3 video-disk players, TV and remote controls.
4. Typed instructions on how to use technologies .
5. Scavenger hunt questions. (20)

Procedures

1. Lessons are done on a 4-5 consecutive days in a computer lab.

2. Students are introduced to the use of the modem, how to get on-line, how to search gopher, Netscape, CD ROM encyclopedia and video-disk "Windows on Science" and Prentice Halls Coronet Series on "Rainforests".

3. Students will be given a list of 20 questions to find answers to using a scavenger hunt method of solving problems. Students would be encouraged to help each other find the answers.

Evaluation

1. Observation
2. Objective: how many scavenger hunt questions did they find?
3. Quiz: on process to access and use the equipment.

Lesson 6: Stacking up the research-compiling a data base

Goals

Students will learn how to compile research in a data base.

Objectives

1. Students will learn how to post data in fields.
2. Students will learn how to link data.
3. Students will post at least (5) students data in a data base.
4. Students will find and use the data needed to solve a mystery using the just created data base.

Materials

1. 30 Macintosh computers
2. Clarisworks (data base) software program
3. 3/5 cards
4. Typed instructions for the data-base program

Procedures

1. Students will write on 3/5 cards the following information:
    * their favorite color
    * their favorite food
    * their favorite kind of music
    * their favorite car
    * their favorite TV show
    * their favorite sport

2. Using a computer and LCD, the teacher will show students how to build a data base using their peers' information.

3. Each student will enter their own information then pass their card to the right and post at least 5 cards.

4. When all the students have posted data from at least 5 cards, they will demonstrate how to extract data from the data base.

5. Students will practice finding all students whose favorite colors are the same, who like the same foods, which students like the same music, which students like the same car, TV show and sport.

6. The teacher will then read a mystery story. Students will take the clues and search the new data base for the culprit.

7. The teacher will illustrate this lesson as a way to research and compile information about the rainforests on a data base.

Evaluation

1. Observations: Did students follow procedures
2. Objective: View data base to see what students posted correctly or incorrectly. Were other students able to find data needed to mystery?

Lesson 7: Grow Your Own Rainforest

Goals

1. To stimulate a rainforest in the classroom.
2. Using the scientific method, students will research, experiment, collect data, analyze, record results and come a conclusion on how plants might exist in a dark rainforest.

Objectives

1. The students will grow a simulated rainforest for two weeks.
2. The students will observe the growth of the mini forest every two days, measure the growth and write all observations about the simulated environment.

Materials

1. Grass seed 1/4 cup
2. One gallon size baggie
3. 3 paper towels
4. 1/2 cup water
5. warm DARK closets
6. marker
7. lab worksheet/ daily recorder

Procedures

1. Form groups of 2-4 students

2. Hand out baggies and have them write their names on them

3. Have groups get materials

4. Wet all paper towels with 1/2 cup water

5. Sprinkle 1/4 cup grass seed IN-BETWEEN paper towels

6. Lay paper towels and seed horizontally in baggie

7. Blow air in baggie and seal tight

8. Write observations on lab sheet

9. Place in dark closet for two days

10. Check "rainforest" every two days. Record observations on lab worksheet. Record length of grass.

11. At the end of two weeks, decide to either end lab or continue for another week.

12. Write final observations and data. Using a computer graph program in Clarisworks spreadsheet, graph data.

13. Record results and write a scientific conclusion.

Evaluation

1. Observation: Observe "rainforests." Offer suggestions to keep air in baggie and how to keep rainforest wet.
2. Objective: Check all lab worksheets to see if students followed scientific method.

Lesson 8: Desktop Research

Goals

1. Students will research different media to find information on rainforests to include in the data base.
2. Practice accessing information using different media.
3. Building technical research skills on the computer.

Objectives

1. Working in cooperative research groups, students will find at least 10 bits of information to enter in their data base.
2. Students will successively enter the information on their groups data base.

Materials

1. 30 Macintosh computers with modems
2. 15 CD ROM's
3. 3 video disks
4. Library /books

Procedures

1. Students will take available time to research varies media for information on their species in the rainforest.
2. Information collected will be placed on their data base.

Evaluation

Observation: Check data base to see if entries are correct and increasing.
Objective: Check to ensure proper use of equipment.

Lesson 9: Heating Up the Earth

Goals

1. To simulate global warming
2. For the students to understand what global warming is and what the effects of global warming are
3. For the students to create ideas for decreasing global warming

This lesson is still under construction.

Lesson 10: What is a Bird?

Goals

The students will understand the concept of camouflage.

This lesson is still under construction.

Lesson 11: Making Connections

Goals

1. The students will be able to observe, make relationships to and understand the importance of specific dependence of the ecological balance in the rainforest.
2. The students will learn to make specific biological observations and make understandable conclusions without prior knowledge.
3. To learn to interact with a knowledgeable speaker to gain knowledge regarding the rainforest.

Objectives

1. Using slides of the rainforests, the students will be able to make observations that will link one species to another.
2. Students will be able to make at least one conclusion on the value of not destroying the rainforest.
3. Students will be able to list at least 10 reasons why the rainforest is important in reducing global warming.
4. Students will be able to list at least 10 reasons to preserve the rainforests.

Procedures

1. A group from Highland High School or George Stevens, from UNM's Department of Biology, will be invited to speak and show slides of the rainforest.

2. Students will be able to make observations about a species in the slide and make connections between other species.

3. Students will engage in discussion regarding global warming and preservation of the rainforest.

4. Students will list 10 reasons how rainforests can reduce global warming and 10 reasons to preserve the rainforests.

Evaluation

Observation: Observe interaction between students and speakers.
Objective: Did students write down lists?

Lesson 12: Sharing the Knowledge

Goals

1. To compile a data base and present to other students
2. To teach other students how to use a data base
3. To build on technological knowledge

Objectives

1. The students will build a data base around one species in the rainforest. The students will have at least 25 entries.
2. The students will be able to pass a quiz on the construction of a data base. 75% of the class will answer 20 questions correctly on a 25 point quiz.
3. Students will share the data base with other students studying the rainforest. Students will present at least 5 of their entries.

Materials

1. 30 Macintosh computers or classroom computer
2. student data bases
3. student quiz

Procedures

1. Students will take a 25 point quiz

2. Students will share data bases with other students from other classes

3. Students will share at least 5 of their entries and share how they built the data base

4. Students will answer all questions relating to the rainforest information gathered and constructed of their data bases

Evaluation

1. Grade quiz
2. Grade data bases
3. Observe interaction between other students and class

Lesson 13: Showing Off

Goals

1. To synthesize and utilize all the information learned about rainforests.
2. To learn how to construct a Clarisworks Slide Show presentation.

Objectives

1. Students will be able to learn how to construct a 4-5 page Clarisworks slide show and present it to the class using an LCD.
2. Students will select 5 inportant facts, 5 pictures or graphics and one mini-sound track to include in the slide show.

Materials

1. 30 Macintosh computers with Clarisworks software
2. 5 rainforest facts of students choice

3. 5 pictures or graphics of students choice
4. 1 mini-sound/ voice track
5. 1-2 scanners
6. Typed instructions for Clarisworks slide show

Procedures

1. Students will be guided through the slide show construction.

2. Students will construct a four to five page slide show that includes 5 facts, 5 graphics or pictures imported from the scanner or other programs. Information will be from facts entered in data base.

3. Students will import one voice or music track.

4. Students will present finished work to class using an LCD presenter.

Evaluation

1. Peer evaluation
2. Observation on projects
3. Objective: Did students meet the project criteria

Lesson 14: The Visual Rainforest

Goals

1. To visualize display knowledge gathered on the rainforest.
2. To share concerns about the rainforest with other students.
3. To use their visual intelligence to share knowledge.

Objectives

1. The students will paint at least 5 speices learned about on a class mural of the rainforest.
2. The students will display their work in the hallway for all to see.

Materials

1. Paper
2. Pencils
3. Large erasers
4. Paint brushes of various size
5. Paint of various bright colors
6. Two pieces of butcher paper at least 14 feet long

Procedures

1. With the cooperation of the art teacher, students will outline their murals on a piece of paper. Prepare a draft.

2. Students will draw species on their murals.

3. Students will paint the mural a long piece of butcher paper.

Evaluation

1. Peer evaluation
2. Teacher evaluation
3. Objective: Did students paint at least 5 species? Did the students complete the mural?