The Rain Forest Project

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A Teacher's Utilization Guide

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http://wneo.org/ama-zone

Ama-Zone! The Rain Forest Project

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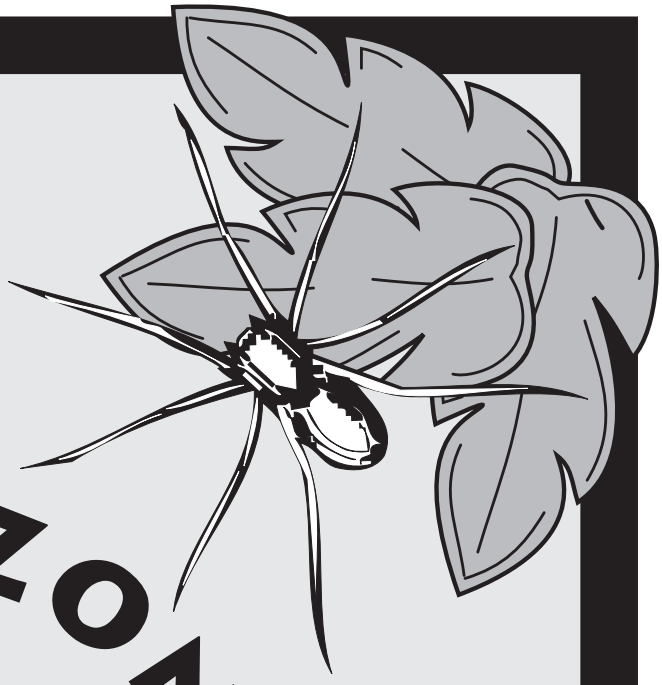

AMA-ZONE!

The Rain Forest Project

How to use the Ama-Zone! Package

http://wneo.org/ama-zone

How to Use Ama-Zone!

*Are you ready for an adventure in the jungle? Are you tingling all over when you think about looking at pictures of snakes, spiders, and other "yucky" things? Well, climb on board the **Ama-Zone!** express. Get yourself and your students ready for an exciting ride through the jungle.*

What's included in the Ama-Zone! package?

Teacher Guide

Part 1 — Ama-Zone! is a cross-curricular, project-based simulation about the possibility of setting aside the Amazon River Basin as a world preserve. Students are asked to take the roles of people who have an interest in either accepting or rejecting the proposal depending upon the point of view of the character they are playing. Students must do research to find supporting data for their point of view. A presentation is made or a debate held with students offering their positions to the rest of the class. A decision is then made as to whether or not the Amazon River Basin should be made into a world preserve.

Part 2 — Science Projects related to key features of the rain forest. Included are lessons about the layers of the rain forest, biodiversity, classification, the interrelationship among species, rain forest products, weather, deforestation, adaptations, and the differences between plants and animals.

Teachers can select either approach (or both approaches) — the simulation or the lesson plans — in working with their class. There is also a third possible use of the material in this packet. The videos, the CD and the Web site can be used separately as resource material.

CD-ROM

The CD contains the **Ama-Zone!** curriculum, photographs in the areas of the Shaman, Villagers, Dr. Linnea Smith (practices medicine in the Peruvian rain forest), Iquitos (rain forest city), Camps, Rain Forest, Bugs, Animals, Plants and the River. Logos for the characters in the simulation are included, as well as video clips and sound bites for each section.

Web Site

The PBS 45 & 49 Web site for **Ama-Zone!** is located at **http://wneo.org/ama-zone**. It contains a hot list of Web sites that can be used in student research. Areas included are Action Groups, General Topics, Deforestation — Logging — Slash-and-Burn, Coffee, Cattle Ranching and Farming, Mining, Animal Life in the Rain Forest, Insects, Fish, Plant Life — Ethnobotony, The People, Lesson Plans, Miscellaneous, and a List of Lists. Also available is a hot list of Rain Forest WebQuests and much, much more.

Instructional Television Programs

The videos, which include footage from the Amazon Rain Forest and interviews with experts, provide a balance between the need for progress and the need for preservation of the Amazon River Basin. The five videos are:

- **Video 1-A Rain Forest Overview** — includes the definition of the rain forest, the layers, biodiversity and information about the people.
- **Video 2-The Challenge** — examines the causes of deforestation through slash-and-burn techniques for cattle raising or farming, and mining in the rain forest. This video tries to balance the progress made with the need to preserve the rain forest.
- **Video 3-Biodiversity** — shows the vast array of plants, animals, and insects and discusses the fantastic spectrum of plants and wildlife.
- **Video 4-The Culture** — documents the joys and hardships in the lives of the riberenos (river people), the native population and the city people.
- **Video 5-Medicine and Pharmacy** — deals with current medicine and the hope of finding future medicines using plants and animals from the rain forest. The shaman, Dr. Linnea Smith (a rain forest M.D.), and Chris Simmons (a pharmacist from the United States) discuss the medical and often cultural aspects of medical treatment and pharmacology.

Show Us Your "Stuff"

Spread the "good word" about what you or your class did when learning about the rain forest. Send us your final products and, after review, we may place them on the PBS 45 & 49 Web site.

Some things you might do when studying about the rain forest:

- A PowerPoint or HyperStudio presentation showing your findings.
- A photoessay that describes your findings through pictures.
- A piece of artwork that displays your feelings about the rain forest.
- A piece of creative writing — narrative, story, or poetry — that conveys a message about the rain forest.

Some cautions

- Students and teachers have permission from PBS 45 & 49 to use anything in this package to make their presentations, including video and photographs. Any other material that is not original must be accompanied with written permission to use. Copyright laws are serious business.
- Do not include full names on presentation material. We want you to be safe when you put material on the Internet.
- You must sign the paper titled "PBS 45 & 49 Project Release" to give us permission to use your material or your picture on our Web site.

You can send your "Stuff" to Ama-Zone! Project at PBS 45 & 49, P.O. Box 5191, Kent, OH 44240-5191, or e-mail them to ama-zone@wneo.org

PBS 45 & 49 Project Release

In consideration of the publicity and exposure that I will gain through this project, I agree as set out below. I agree to allow images created through photography, videography, or other electronic means in which I appear to be edited, reproduced and distributed for unlimited use, in whole or in part, by PBS 45 & 49. I also agree to the use of such images by anyone who is licensed to do so by PBS 45 & 49. I understand that the means of distribution envisioned by this release include, but are not limited to, print, broadcast media, "narrow-cast" media, the Internet and the World Wide Web, and even means of distribution yet to be discovered.

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For Minors

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I fully intend that this release be binding upon him or her, me and upon anyone who, in the future, would acquire rights from one or both of us by inheritance or otherwise.

_____ _____

Signature Date

_____ _____

Printed Name Address

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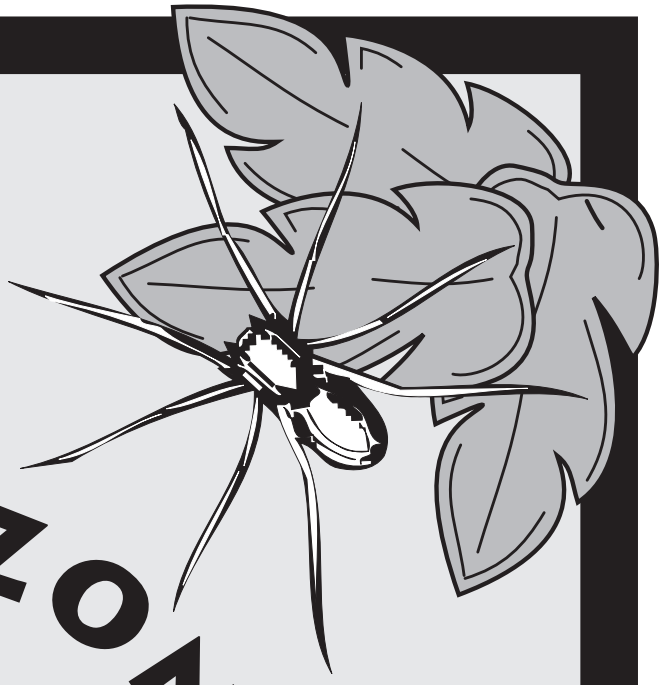
City/State/Zip Code



AMA-ZONE!

The Rain Forest Project

The Simulation

http://wneo.org/ama-zone

Part 1 — Procedures for Using the Simulation

Goal

The main goal of this simulation is for students to understand that their actions have an effect on the rain forest and, in turn, the rain forest (products, animals, etc.) has an effect on them. We, as individuals, need to be aware of our actions and the consequences of choices we make.

Basic Design

The basic design of the program involves:

1. Overview of the rain forest. *(use video 1 and video 2)*
2. Presentation of the problem.
3. Assignments of roles for each student.
4. Assignments to students to do research on their characters' point of view.
5. Student presentations of the points of view of their character to the rest of the class.
6. Designing a debate to determine the fate of the Amazon River Basin.
7. Making a decision as to what will be done.

Getting Started

In the Teacher Sheets section, a lesson plan is presented that gives an introductory approach for opening a unit on the rain forest. This approach can be used to introduce students to the concepts involved in the study of the rain forest: the study of the physical rain forest, the biodiversity, the culture, and the challenges.

An alternative introductory approach would be to use **Video 1-The Rain Forest Overview** and **Video 2-The Challenge** to give an overview of the topic. A photographic tour could also be conducted using the photographs on the CD.

The goal of the introduction is to generate interest in the subject and to gain basic information about the rain forest by presenting the problem of creating an Amazon World Preserve. The ultimate decision of how to begin rests with the teacher.

Classroom Management

Fourteen characters are presented who could be guests at the World Rain Forest Summit, which is being held to determine the fate of the Amazon River Basin. Each character could be assigned to a student or a group of students. The students in turn will do research on the point of view of their character. Some points of view are obvious, but others may need some guidance. It is possible that a group may be assigned a character and not agree with that character's point of view. It is their job, however, to present to the class the position of the character and not necessarily their own beliefs.

Some characters can be grouped together, such as the rancher and the fast food executive. They have similar interests.

It is not necessary to use every character. It is important, however, to make sure that if you use a character, there is some opposing view to his position. For example, if the cattle rancher is used and he needs the grazing land for his cattle, an opposing view might include the native person who needs the rain forest intact to live or the pharmacist who needs the rain forest to secure plants for medicinal purposes.

The Research

There are several ways in which students can carry out research to find facts to support their characters' points of view.

- In the Student Roles pages, teachers are given sources from the CD, the videos and the Web site to which they can direct students. The motivation for each student role is also given.

- Print materials (both books and periodicals) are available at the media center of most schools and at all public libraries.
- The Internet is a vast source of information. The students can access a safe starting point at the PBS 45 & 49 Web site that links to a myriad of sources (**http://wneo.org/ama-zone**). Key words are also given for each character. They can be used on the Internet with search engines to find the information needed.
- Personal interviews are valuable resources in arriving at the point of view of the character. If there is not a person to interview with the same position, a comparable occupation or a person knowledgeable about that occupation is also quite appropriate.
- Students should look for statistical information that could be presented through the use of graphs and charts to support their point of view. This brings additional math and science skills to the unit.

It is recommended that the students find three Internet sites, three print sources, and one interview to determine their position. The teacher can alter this relative to the age level, time available and ability of the students. It is important for students to cite all sources that they use in their presentation.

The Presentation

After doing research, each group will present to the World Rain Forest Summit (the class) its point of view. Students should try to convince the class that their point of view is correct and that they should be supported by the rest of the participants at the World Rain Forest Summit. Presentations could employ a variety of approaches. Some examples are:

- PowerPoint or HyperStudio presentations
- Skits
- TV news reports
- A commercial or a public service announcement stating their point of view
- Videos
- Photo essays
- Newspapers
- Songs
- Demonstration using charts and graphs

The Debate

After all groups have made their presentations, there could be a debate about the fate of the Amazon River Basin. The teacher could be the moderator of the debate or some other knowledgeable person could take command. This is a very difficult task and requires someone who will be in control of the group.

The fate of the Amazon River Basin could be decided in a variety of ways:

- The moderator could make the decision.
- The class could vote on whether to make a World Rain Forest Preserve.
- The presentations and/or debate could be done in front of another class in the building or via distance learning and the audience could make the decision.
- A panel of outside judges (other teachers, parents, the principal, etc.) could make the decision.

Once the decision is made, please e-mail PBS 45 & 49 at **ama-zone@wneo.org** with your results. We'll keep track of the decisions made by the schools and post the results on our Web site.

Simulation Lesson Plan

Goals

- Utilize and integrate previously learned skills from various disciplines.
- Provide awareness of the complexity of the problems associated with the Amazon rain forest.
- Encourage the use of current technology as a research tool.
- Provide an opportunity for students to understand and respect multiple perspectives and conflicting philosophies.

Objectives

The students will be able to:

- Meet Ohio Proficiency outcomes as listed on the CD.
- Define tropical rain forests.
- Locate the Amazon rain forest on a map/globe.
- Identify the layers of the rain forest.
- Describe the biodiversity, culture, climate, and people of the rain forest.
- Use various search engines to conduct online research.
- Determine the validity of sources of online information.
- Schedule and conduct an interview with an expert.
- Compile information into a point of view appropriate to their role.
- Identify and present supportive information that will be mathematically displayed as a graph, chart, scale drawing, data table, etc.
- List and explain three ways in which humanity influences the survival of the rain forest.
- List and explain three ways in which the rain forest influences the survival of humanity.
- Effectively communicate their position in speech and in writing.

Procedures

1. Have students freewrite to determine their knowledge base and feelings about the rain forest. **Student Sheet #1**
2. Show **Video 1-A Rain Forest Overview** and **Video 2-The Challeng**e (from PBS 45 & 49) to class and allow time for student responses on the question sheets. **Student Sheets #2 and #3**
3. Present introductory information to students (definitions, maps, culture, peoples, structural information, biodiversity, geography, etc.). (Pages 25 & 26)
4. Provide overview of problem students are to address. (Page 24)
5. Assign roles to students.
6. Model expectation of research paper and point-of-view presentation.
7. Provide grading criteria and sample bibliography.
8. Allow and support research and composition time. Materials needed are:
    A. Copy of original with a written summary or notes from at least three *online sources.* Pass out **How to Use a Search Engine — Student Sheet #4 & Research Summaries — Student Sheet #5**
    B. Written summary or notes from at least three *print* sources. **Student Sheet #5 & #6**

C. Written summary or notes from at least one teacher-approved interview. **Student Sheets #7 and #8**

D. Written summary or notes from at least one additional technology resource (CD, video, etc.). **Student Sheet #5**

E. Check development of point-of-view and progress on research paper through periodic teacher conference(s). **Teacher Sheet #1**

F. Check student progress in identifying information that will be mathematically displayed as a graph, chart, scale drawing, data table, etc., which supports their point of view. **Student Sheet #9**

G. Provide time for students to prepare a brief statement of position to present to all classmates — a teacher conference will be scheduled to check progress. **Student Sheet #10**

H. Provide time for students to practice the presentation of their ideas.

9. Schedule presentations and debate and collect research papers.

10. Conduct debate/discussion. **Student Sheet #10**

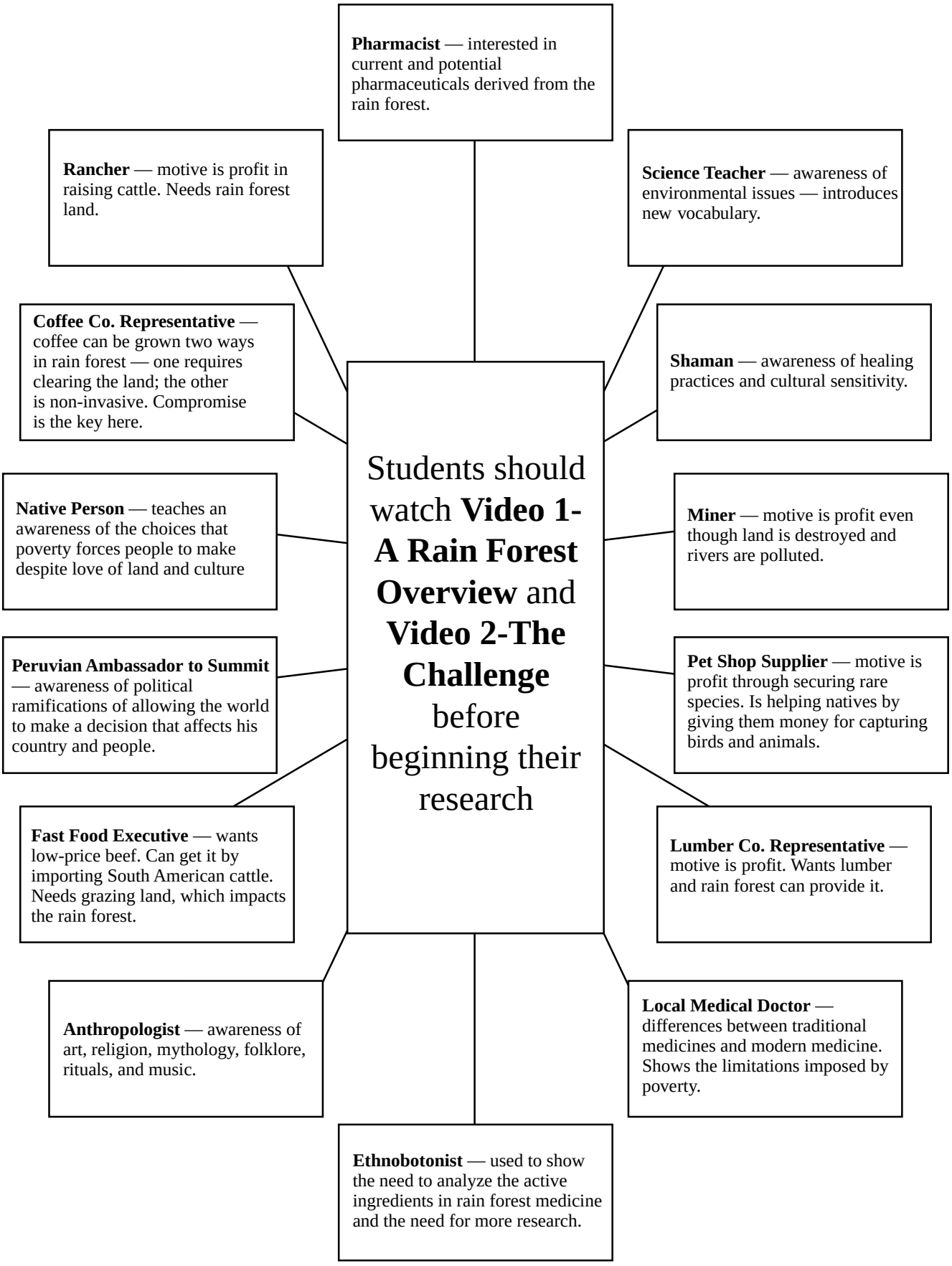
11. Evaluate student understanding using post-test. **Student Sheet #11**

Evaluation

The students will compose an essay of eight paragraphs. The first paragraph will be an introduction. The next three paragraphs will address the influence of humanity on the survival of the rain forest. The second set of three paragraphs will address the influence of the rain forest on the survival of humanity. The last paragraph will address the students' personal opinion on the question.

Rubric for grading is on **Teacher Sheet #2.**

Student Roles Overview



Student Roles

Miner

- P. Clementine
- Born in the U.S.A.
- U.S. citizen
- Works for a U.S. international mining company
- Mines for gold
- Head of the Department of New Resources

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *Garimpeiros, gold, gold mining and rain forest, mercury toxicity, South American mining, iron ore*

To narrow your search: *Where the words rain forest or South American appear, try substituting Ecuador, Peru, and/or Brazil.* ***For example:*** *"gold mining in Peru."*

Motivation

This character's main motive is to obtain ore from the rain forest land. This character is also searching for methods of creating personal profit. He/she might search for information about the increase in the price of gold over the years or mining practices.

One would hope that in the search he/she will discover that damage is being done by various mining practices including the use of mercury in gold mining and the devastation of the terrain due to strip mining. These findings will probably not be used in the presentation, but might be noted in the research findings.

For research, student could use Videos 2 and 3. The Web site under General Topics and Mining contains information about mining in the Amazon.

Shaman

- R. Gonzales
- Medical and spiritual healer (herbalist) for a specific village
- Age 45
- Born along the Amazon River near Iquitos
- Education: apprentice

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *shaman, medicine man, healer, Yagua, Riberenos, Aguaruna, Kayapo, Mehinaku, Waimiri-Atroari, Amazonian Indians, Mestizo, Don Antonio Montero Pisco*

Motivation

This character was chosen to lead the group to an awareness of healing practices used by native peoples. He is also present to remind us to continue investigation of the validity of these methods. This also includes the idea that many plant products have not as yet been discovered and if the rain forest is lost, so are these potential remedies. His presence also helps develop cultural sensitivity.

For research, student could use Videos 2, 3, 4 and 5. The CD has pictures on this topic in the areas of Shaman, Dr. Linnea Smith and Plants. The Web site has information under General Topics and The People section.

Science Teacher

- P. Zammer
- 8th grade science teacher in Ohio
- Has worked with Los Amigos during the summers for the last 10 years

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *Los Amigos, ecology, deforestation, green house effect, biodiversity, endangered species, rain forest harvest, rain forest preservation*

To narrow your search: *Where the words rain forest or South American appear, try substituting Ecuador, Peru, and/or Brazil.* ***For example:*** *"ecology in Peru."*

Motivation

This character was chosen to lead the group to an awareness of environmental issues surrounding our dependence upon the rain forest. The character will also be used to introduce the large number of new vocabulary words to the students.

For research, student could use Videos 2, 3, 4, and 5. The CD has pictures on this topic in the areas of Plants, Animals, Bugs, and the Shaman. The Web site can be searched in the areas of Action Groups, General Topics, Plant Life and Animal Life in the Rain Forest.

Pharmacist

- H. Dietrick
- From Sweden
- Has leukemia
- Age 30 with 2 children

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *ethnobotany, herbal remedies, rain forest medicine, pharmacology, curare, rain forest remedies*

To narrow your search: *Where the words rain forest or South American appear, try substituting Ecuador, Peru, and/or Brazil.* ***For example:*** *"pharmacology in Peru."*

Motivation

This character was chosen to lead the group to an awareness of current and potential pharmaceuticals derived from the rain forest.

For research, student could use Videos 2, 3 and 5. The CD has pictures on this topic in the areas of Plants, the Shaman, and Dr. Linnea Smith. The Web site can be searched in the areas of Action Groups, General Topics and Plant Life — Ethnobotony.

Rancher

- S. Brush
- Born and raised in Brazil
- Ranch worker hoping to own his own cattle ranch

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *Brazil, Brazilian agriculture, cattle ranching, slash-and-burn, chemical fertilizers, deforestation, gauchos, rain forest clear-cutting, erosion in the Amazon, Brazilian agriculture, Brazilian beef, Agrosoft online, rain forest products*

Motivation

This character's main motive is to remove lumber from the rain forest land to make available grazing land for cattle. Both lumber and grazing create profit. This character is searching for methods of creating personal profit. He/she might search for information about the increase in the price of cattle over the years.

One would hope that the group will arrive at an awareness of the conflict present between the need for land to raise cattle and the destruction of the rain forest. This destruction causes a reduction in biodiversity. This issue might not be used in the presentation, but it is important that the student sees the conflict.

For research, student could use Videos 1 and 2. The CD has pictures on this topic in the Rain Forest section. The Web site can be searched in the areas of General Topics and Cattle Ranching and Farming.

Coffee Company Representative

- Y. Rodreguiz
- Born and raised in Brazil
- Works for agriculture department
- Responsible for coffee production for the Brazilian government
- Researching ways to grow coffee as a sustainable crop

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *Coffee, Rain Forest Action Network, rain forest products, sustainable rain forest crops, growing coffee*

To narrow your search: *Where the words rain forest or South American appear, try substituting Ecuador, Peru, and/or Brazil.* ***For example:*** *"coffee in Peru."*

Motivation

This character was chosen to lead the group to an awareness of the fact that coffee (a sustainable crop that allows the rain forest to maintain its main characteristics.) is grown two ways in the rain forest. One requires the clearing of land while the other is non-invasive. This character shows that compromises can be made. (**Note:** The search for information on the Internet about this topic is more difficult than about most of the others.)

For research, student could use Video 2. The Web site can be searched in the areas of General Topics and Coffee.

Native Person

- S. Sanchez
- Age 16
- Born along the Amazon River in Peru
- Went to school through Grade 5 and is now weaving thatch for roofs that are sold in the city

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *Amerindians, Yugua, Kayapo, Riberenos, Aguaruna, Mehinaku, Waimiri-Atroari, Amazonian Indians, Mestizo*

Motivation

This character was chosen to lead the group to an awareness of the poverty and the choices that poverty forces people to make despite personal feelings about their land or culture.

For research, student could use Videos 2, 3 and 4. The CD has pictures on this topic in the area of Villages. The Web site can be searched in the areas of General Interest and The People.

Pet Shop Supplier

- I. Gambel
- Collects freshwater tropical specimens and rare birds for sale outside of South America
- Sells primarily to exotic pet stores

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *Endangered species, collecting tropical fish, exotic birds, Macaw, parrot, piranha, tarantula, iguanas, import of animals, export of animals*

Additional Suggestions: *Contact a local veterinarian and/or the owner of a pet store.*

Motivation

This character's main motive is to obtain exotic species of birds, animals, and fish from the rain forest land. This character is also searching for methods of creating personal profit. He/she might search for items like the prices paid for these animals or for the possibility of raising these species in a "farming" situation. He/she can argue that the work is educational and ultimately helps preserve the rain forest.

One hopes the student will achieve an awareness of the presence of an industry that removes species from their natural habitat for profit. Often it is native people selling these birds, so an argument could be made that this industry is helping the native population.

For research, student could use Videos 2, 3, and 5. The CD has pictures on this topic in the area of Animals. The Web site can be searched in the areas of General Topics, Animal Life in the Rain Forest and Fish.

Lumber Company Representative

- N. Teak
- Born and raised in Brazil
- In charge of exports for a major Brazilian lumber company

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *mahogany, deforestation, teak, Earth Summit 1992, Mato Grosso, slash-and-burn, Southern Para, Rondonia, forestry facts*

Motivation

This character's main motive is to obtain lumber from the rain forest land. This character is also searching for methods of creating personal profit. He/she might search for items like the increase in the price of lumber over the years or lumbering practices.

One hopes this character will achieve an awareness of the effects of deforestation and other methods that use rain forest resources for profit, although this may not be part of his/her presentation.

For research, student could use Videos 2 and 3. The CD has pictures on this topic in the Rain Forest section. The Web site can be searched in the areas of General Topics and Deforestation — Logging — Slash-and-Burn.

Peruvian Ambassador to the United Nations

- P. Munoz
- Born and raised in Peru
- Represents Peruvian interests on the key question

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *Peru, Peruvian economy, Peruvian trade, Peruvian exports and imports, Peruvian nature preserves*

Motivation

This character will lead the group to an awareness of political ramifications of allowing the world to make decisions that affect his country and people.

For research, student could use all video segments. The CD has pictures on this topic in all areas. The Web site can be searched in the areas of Action Groups and General Topics.

Anthropologist

- J. Badsome
- Born and raised in Ecuador
- Studying the cultures of the rain forest peoples

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *rain forest culture, religions and South America, native art and music, tribal ceremonies, artifacts, rituals, creation myths, folklore, Yagua, Riberenos, Aguaruna, Kayapo, Mehinaku, Waimiri-Atroari, Amazonian Indians, Mestizo*

To narrow your search: *Where the words rain forest or South American appear, try substituting Ecuador, Peru, and/or Brazil.* ***For example:*** *"forklore of Peru."*

Motivation

This character will lead the group to an awareness of art, religion, mythology, folklore, rituals, artifacts, and music of the rain forest people.

For research, student could use all videos. The CD has pictures on this topic in the areas of Villages, the Shaman, and Iquitos. The Web site can be searched in the areas of General Topics and The People.

Fast Food Chain Executive

- R. King
- Born and raised in Texas, U.S.A.
- Wants to purchase land to raise cattle

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *cattle ranching, slash-and-burn, deforestation, gauchos, rain forest clear-cutting, rain forest soil depletion, erosion in the Amazon, Brazilian beef, Brazilian cattle market, Agrosoft online, rain forest products, fast food chain names, imported beef and South America*

To narrow your search: *Where the words rain forest or South American appear, try substituting Ecuador, Peru, and/or Brazil.* ***For example:*** *"ranching in Peru."*

Motivation

This character's main motive is to obtain beef from the cattle raised on rain forest land. This character is also searching for methods of creating personal profit. He/she might search for information such as the increase in beef prices over the years.

One hopes research will lead the students to an awareness of this as another exploitive industry. This character may be combined with the rancher as they have similar interests.

For research, student could use Video 2. The Web site can be searched in the areas of General Topics and Cattle Ranching and Farming.

Local Medical Doctor

- J. Bournaise
- Supplements local medical practices with modern medical practices
- Received medical degree in Paris, France
- Worked in Paris for ten years before moving to South America

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *Linnea Smith, homeopathic medicine, ethnobotany, pharmacology, alternative treatments, herbal remedies, rain forest medicine, curare, Red Cross*

Motivation

This character will lead the group to an awareness of differences between traditional rain forest medicinal practices and those of modern medicine. He/she also helps to illustrate the limitations imposed by poverty.

For research, student could use Videos 2, 3, 4, and 5. The CD has pictures on this topic in the area of Dr. Linnea Smith. The Web site can be searched in the areas of General Topics, The People and Plant Life — Ethnobotony.

Ethnobotanist

- Professor B.T. Gap
- College professor from the University of Michigan
- Studying the local flora in search of new medicines and the active ingredients in local remedies

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

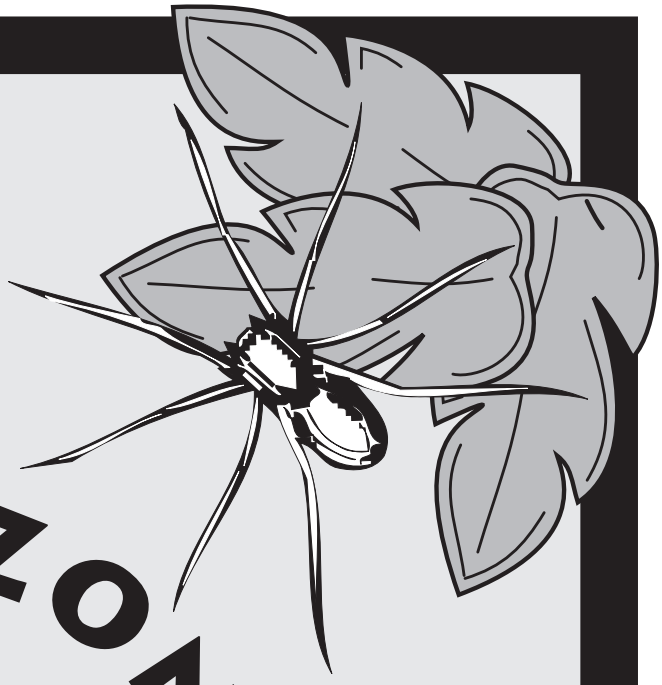
Suggested key words: *pharmacology, compounding, alternative treatments, herbal remedies, rain forest medicine, curare, rain forest remedies*

Motivation

This character will lead the group to an awareness of the need to analyze the active ingredients in shaman/rain forest remedies and the need to search for new remedies before it is too late.

This character or the M.D. above may be combined with the pharmacist.

For research, student could use Videos 2, 3 and 4. The CD has pictures on this topic in the areas of Dr. Linnea Smith, the Shaman and Plants. The Web site can be searched in the areas of General Topics and Plant Life — Ethnobotony.



AMA-ZONE!

The Rain Forest Project

Teacher Sheets

http://wneo.org/ama-zone

The Problem

A fictional World Rain Forest Summit will be held to propose the adoption of the Amazon rain forest as ***The Amazon World Preserve****. Many experts have been called to testify before the World Council to illustrate the pros and cons of this proposal.*

You will:

- be assigned the role of one of these experts and be expected to research that expert's field.
- decide the expert's position based upon the research you have conducted and assume the role.
- make a presentation to the class of the position that you, as the expert in that field, will take before the World Council.
- give a presentation or engage in a debate with your classmates to determine the fate of the Amazon rain forest.

Rain Forest Introductory Strategies

Developing a definition:

Have students give their ideas about what a rain forest is. Brainstorm ideas and put together information generated by the students.

- An acceptable definition should include:
  - Heavy rainfall
  - High humidity
  - Warm environment

Introducing the unit:

1. In an effort to generate curiosity and identify personal knowledge on the subject, have the students divide their paper into three columns:

   What I Know **What I Want to Know** **What I Learned**

   Give students about three minutes on each of the first two sections, discussing student responses after each is filled in. Ask them to focus on the questions they posed in the "What I Want to Know" column as they study this unit on the rain forest. Students could then use column three to take notes as you give the introductory information (which could include teacher presentations and/or Videos 1 and 2).

2. In an effort to determine how much we depend on the rain forest, you could brainstorm all the food and other products students have used in a 24-hour period. Have a recorder integrate the lists on the chalkboard into categories. Then relate to the students how many of these foods and other products came from the rain forest. Ask them if they know if using these products has a negative impact on the rain forest and how they might find out. The teacher could point out some of the obvious ones, such as **woods, canes and fibers** (balsa, bamboo, mahogany, teak, rosewood, sandalwood, jute, rattan); **food products** (avocado, banana, grapefruit, lemon, lime, orange, papaya, pepper, pineapple, etc); **spices and flavors** (allspice, black pepper, cayenne, chocolate, cocoa, cinnamon, nutmeg, paprika, vanilla, etc.); **other food products** (brazil nuts, cashew nuts, coffee, corn, peanuts, rice, sugar, tapioca, tea, macadamia nuts); and **household products** (African violets, Christmas cactus, orchids, chewing gum, and rubber for balloons, erasers, rubber bands, shoes, tires, etc.).

   An excellent reference for a more complete list can be found in Ranger Rick's Naturescope Rain Forest-Tropical Treasures, edition titled "Jungle in the Pantry." This can be found in the March, 1993, issue of Learning, p. 57.

General Concepts:

Information could be presented after viewing the introductory videos on the rain forest and its people, **A Rain Forest Overview** and **The Challenge**. These videos give students an appreciation for the environment, the people, and the organisms living there.

Major Concepts:

Biodiversity

The great variety of life in the rain forest demonstrates biodiversity. In the United States forests might have six species of trees. In a rain forest you will find as many as 500 species.

Rain Forest Structure

There are four layers, each having distinct environmental conditions and organisms adapted to it:

- **Emergent Layer** (sometimes called Overstory) — Tallest layer, emerging from the canopy layer. Trees grow up to 600 ft (200 m) with trunks up to 16 feet (5 m) around. Most are hardwood, broad-leaf evergreens with buttressed roots. Leaves are thick and waxy to hold water. Animals found here include monkeys, eagles, butterflies, insect-eating bats, and snakes.
- **Canopy Layer** — Spreads out below the emergent layer. Trees grow to 150 ft (45 m). Leaves are smooth and oval and come to a point. These are called "drip tips" and serve to shed rain quickly. The canopy filters out 80% of the light, preventing it from reaching the forest floor. The animals found in the canopy include monkeys, sloths, bats, treefrogs, ants, beetles, parrots, hummingbirds, and snakes. Epiphytes (plants that grow up in the trees and never touch the ground) like bromeliads collect pools of water.
- **Understory Layer** — Plants grow here up to 12 ft (3.5 m) in the shade of the canopy trees that cut out 15% more light or a total of 95%. Plants have unique adaptations such as strong smelling flowers to attract the main pollinators (insects) and cauliflory (a phenomenon which makes them more conspicuous to the pollinator). Plants include dwarf palms, soft-stalked species of families such as ginger, acanthus, and Maranta (prayer plant). Animals include snakes, frogs, parakeet, leopard, jaguar, and many insects.
- **Forest Layer** — Almost no plants grow here. The floor receives 2% of the light or less. The relative humidity is often 100%. Rapid decomposition occurs here and recycles many nutrients to the forest. A high concentration of fungi is found here. Shallow-rooted trees compete for these nutrients. Animals found here include tapirs and insects including termites, cockroaches, beetles, millipedes, scorpions, and earthworms.

Value of the Rain Forest

Trees supply us with oxygen and use excess carbon dioxide. Many species of plants and animals that live here are not found anywhere else in the world. There are over 1500 potential new fruits and vegetables growing in the world's rain forests. Many products and medicines come from the rain forest. Future medicines may exist in rain forest organisms. A quarter of the medicines in our drugstores today owe their origins to the rain forest plants and animals. Rain forest tribes have a rich culture and knowledge of the rain forest that more industrialized nations do not possess.

Geography

Over half of the world's tropical rain forests are in South and Central America. The remainder are in Africa, Asia, and Australia. Almost all tropical rain forests lie between the Tropic of Cancer and the Tropic of Capricorn. The largest rain forest stretches across the Amazon Basin in South America. The Amazon is the largest river system in the world.

The People

A large area of rain forest can support only a few hundred people so rain forest tribes are spread thinly through the wooded lands. Rain forest tribes have their own cultures and customs. They have a deep understanding of their surroundings and are able to survive in the hot, humid environment. Few people live beyond age 40. Diseases like influenza and measles, introduced by European settlers, have caused over 80 tribes to disappear. Although they have rights according to international law, their land is often stolen and invaded. As the rain forests are destroyed, the knowledge of the ancient tribes will disappear also.

Rain Forest Destruction

Rain forests are cleared to reach minerals such as gold, copper, iron, and uranium, and for cash-crop plantations like coffee, cocoa, or bananas. Many poor, homeless people are encouraged to leave overcrowded cities to farm pieces of rain forest using slash-and-burn techniques. Slash-and-burn involves burning vegetation to clear the land and enrich the soil. After a few years of growing crops, the land becomes as barren and lifeless as a desert. This is because thin topsoils are quickly depleted and washed away by tropical rains. Scientists believe that there will be no rain forests left by the year 2050 if destruction continues at the present rate.

Teacher Sheet #1

Checklist for Teacher's Use

Student or Group Name	Assigned Character	Three Online References			Three Print References			Alternate Reference	Pre-Interview	Post-Interview	Point of View	Debate Notes	Graph/ Visuals	Peer Editing		

Supplemental Materials for Language Arts teachers

The following two novels are recommended for reading material in a language arts class during the rain forest unit. They shouldn't be read before the unit unless the teachers don't mind the preset of opinion the novels will give participating students.

Jaguar by Smith, Roland J.

This novel's main character is a middle school-aged boy whose father is a research field scientist. The father is working in the Brazilian rain forest helping an associate set up a jaguar preserve. The son is left behind to live in a retirement home with his grandfather since there is no one else to watch over him. During spring break, the son visits his father and, due to an accident and lack of other options, is selected to fly an ultralite airplane to help with radio tracking of the jaguars. Father, son, and a female botanist who works in the canopy go upriver with a boat captain who doesn't tell them that his main desire is to find and exploit the mythical gold mine of a lost tribe. The conflicts include the father and son relationship, the establishment of a preserve in the rain forest vs. selling the land outright to slash-and-burn companies, and the "villain's" change from gold robber to rain forest appreciator. The book is not fact heavy and cannot be counted on as a research source, but it will give students a sensitivity to the current conflicts involving the rain forest. The book is appropriate for advanced 4th graders up to low-level 8th graders.

Deep Dream of the Rain Forest by Bosse, Malcolm

This novel differs from Jaguar in many ways. It has a slightly higher reading level due to more description and more complex syntax and would be appropriate for advanced 5th graders up to low reading level high school students. The story is also set in a different era. It takes place in the 1920s, and ecology or preservation of the rain forest is not an issue in this book and not addressed directly. It is also set in the rain forest jungles of Borneo rather than Brazil and Peru. If all these things make the book seem inappropriate for this unit, it is still recommended for its detail on the rain forest environment and people. Respect for the traditional ways of the people of the rain forest as opposed to the automatic supremacy of the white newcomers is a major theme in this book as a 15-year-old boy finds himself traveling through the jungle with two teen-aged peers from the Iban tribe. The main character, a British boy named Harry, learns to admire and adopt the attitude and survival skills of the Iban boy. The Iban girl teaches Harry about native medicinal knowledge and also shows him that they share a certain "humanity" as she deals with her physical handicap. The description of the jungle, its plants and animals, and the ways of the tribal people are rich in detail compared to Jaguar. This novel would be appropriate for use as a supporting story in a social studies class concentrating on cultural awareness and respect.

Suggested Evaluation Rubric of Final Test

_____ Introduction (10 points)

_____ Statement and explanation of three ways in which humanity influences the survival of the rain forests (40 points)

_____ Statement and explanation of three ways in which the rain forest influences the survival of humanity (40 points)

_____ A summary which illustrates a change in personal view or an increase in knowledge (10 points)

Suggested Evaluation Rubric of Research Paper

_____ Point-of-view/thesis statement (20 points)

_____ Supportive statements/research (30 points)

_____ Conclusion/summary (10 points)

_____ Mathematical component (graph, chart, etc.) - this must include written explanation (15 points)

_____ Format (hand-written or computer-generated) (5 points)
- title page
- bibliography

_____ Mechanics (spelling, punctuation, grammar, etc.) (20 points)

Suggested Evaluation of Presentation

_____ Point-of-view/thesis statement (20 points)

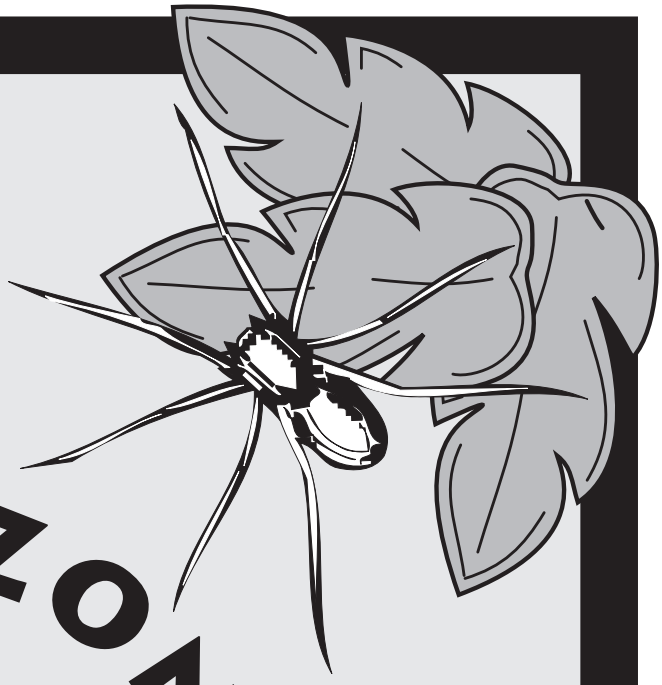
_____ Supportive statements/research (30 points)

_____ Conclusion/summary (10 points)

_____ Mathematical component (graph, chart, etc.): this must include explanation (15 points)

_____ Format (hand-written or computer-generated) (5 points)
- title page
- bibliography

_____ Presentation (flows well, keeps audience interest) (20 points)



AMA-ZONE!

The Rain Forest Project

Student Activity Sheets

http://wneo.org/ama-zone

Developing a definition/Freewrite

Given the term “rain forest” what do you associate with it? What does it mean? Include any sounds, facts, pictures, past science lessons, news reports, and general impressions and feelings you have when you hear the words “rain forest.” Remember, this is a freewrite. It is not graded. It does not have to be grammatical or spelled correctly. It’s just a collection of your thoughts.

Answer these questions while watching Video 1 — Rain Forest Overview

Rain Forest Overview Video

1. About how many inches of rain does the rain forest receive each year?_____

2. The rain forest is _____times more diverse than the forests in the U.S.

3. What is the canopy? The canopy walkway?

4. The Amazon River holds about how much of the planet's fresh water supply? _____

_____

5. The Amazon River is about _____miles long, or the distance between New York and San Francisco.

6. Ribeneros are people who live_____.

7. Name three problems that are occurring in the rain forest.

- _____
- _____
- _____

Answer these questions while watching Video 1 — Rain Forest Overview

Rain Forest Overview Video

1. About how many inches of rain does the rain forest receive each year? **100 inches**

2. The rain forest is **10** times more diverse than the forests in the U.S.

3. What is the canopy? The canopy walkway?

   The canopy is a forest layer about 150 feet up in the trees. The walkway is a man-made walk that humans can use to see the plants and animals living in the canopy.

4. The Amazon River holds about how much of the planet's fresh water supply? **It holds about 2/3 of the planet's fresh water supply.**

5. The Amazon River is about **3900 or 4000 miles** miles long, or the distance between New York and San Francisco.

6. Ribeneros are people who live **along the Amazon River**.

7. Name three problems that are occurring in the rain forest.

   (Possible answers) **Logging, taking exotic species for resale, mining, loss of culture, loss of biodiversity, and others.**

Answer these questions while watching Video 2—The Challenge

Challenge Video

1. The trees of the Amazon absorb carbon dioxide and produce _____.

2. One cause of global warming could be the "greenhouse effect." This could be partially caused by

   _____.

3. Clearing the trees from the rain forest is called_____.

4. Many plants found in the rain forest are used for_____.

5. Another name for the indigenous people is the _____ people.

6. One reason native people might sell exotic animals from the rain forest is _____

   _____

7. Why might people visit the rain forest? _____

   _____

   _____

   _____

   _____

   _____

Answer these questions while watching Video 2—The Challenge

Challenge Video

1. The trees of the Amazon absorb carbon dioxide and produce **oxygen**.

2. One cause of global warming could be the "greenhouse effect." This could be partially caused by **cutting down the trees.**.

3. Clearing the trees from the rain forest is called **deforestation**.

4. Many plants found in the rain forest are used for **medicine**.

5. Another name for the indigenous people is the **native** people.

6. One reason native people might sell exotic animals from the rain forest is **to make money to support their families**

7. Why might people visit the rain forest? **Answers will vary**

Using a Search Engine to Do Research

Throughout this project, you will be using the Internet to find facts and other information that you need to verify or prove your position. You can start at the PBS 45 & 49 Web site. Go to ***http://wneo.org/ama-zone****. You should be able to find the information on the position your character holds. You may also need to use a search engine on the Internet to find information. We recommend the following search engines:*

Ask Jeeves for Kids

This is generally used by students in grades 4 through 9. Ask Jeeves allows students and adults to write their questions in plain English rather than using key words as other search engines require. To find out what spices are found in the rain forest, simply type in the question, "What spices are found in the rain forest?" You will then be prompted to narrow your category by a series of questions. You select the area that will answer your question. Sites are prescreened for inappropriate material. The URL is **http://www.ajkids.com**.

When using other search engines it is necessary to use key words (descriptors) to tell the engine what you are looking for. If you are interested in learning about coral snakes, you could use *snakes* as your key word. You would get many responses that do not deal with *coral snakes*. You could, however, put quotation marks around "coral snakes" so that you get listings where the words coral and snake are listed together and other snake families are eliminated.

You can also narrow your search by using the words **AND** or **NOT** between key words. If you want to know about Abraham Lincoln, you might say "Lincoln NOT penny" to avoid any references to Lincoln pennies. This makes your search narrower.

Altavista

Altavista is a fast and comprehensive search engine. It searches the entire Web and the Usenet (a collection of user groups within the Net) so you get tons of data. Often many sources are given and the search needs to be narrowed. (**http://www.altavista.com**)

Excite

Excite is a powerful search engine and a well-organized index. It allows multiple means of finding information and allows you to customize features. It includes a Newstracker to keep up on news of interest to you, a chat room and a city.net which tells about more than 4000 locations in the world. (**http://www.excite.com**)

Hotbot

Hotbot is one of the largest search engines. It includes pull-down windows that allow you to refine searches by date, location, etc. It also allows you to access sound, still pictures and/or video. (**http://www.hotbot.com**)

Yahoo!

Yahoo! is a great place to start a search. It includes maps, people searches, the latest news, sports, etc. There is also **Yahooligans**, which is directed to kids. It does not give you as many "hits" as the other engines because it searches only preselected sites but this is often sufficient for school use. (**http://www.yahoo.com**) (**http://www.yahooligans.com**)

Research Summaries

Name _____

Use one sheet for each reference source.

Bibliographical information in correct form: (See Citing Electronic Resources (Student Sheet #6) to know what information you need for books, newspapers, magazines, online sources, videos, or CDs.)

What facts did you learn that you will be able to use in your report? Just list them. It's not necessary to write sentences here.

Now it's time to write the sentences. Summarize the information you've learned.

How did this information change or support what you already know?

If more space is needed, please continue on the back.

Citing Electronic Sources

This is MLA Style.

Web Page

Author(s). Name of page. Date of Posting/Revision. Date of access. <electronic address>

It is important to use the date of access because Web pages are often updated and information available on one day may not be available later. Be sure to include the <and> markers.

For example,

The information on this page is from

Purdue OWL Handouts-Using Modern Language Association Handout.

Access August 11, 1999 <http://owl.english.purdue.edu/files/33.html>

Online Journals

Author(s). "Title of Article." Title of Journal Volume. Issue (year): Pages/Paragraphs. Date of Access <electronic address>

E-mail

Author. E-mail to the author. Date

This is the same format that is used for personal interviews or personal letters except that the word e-mail is changed to interview or to letter.

Listserv Postings

Author. "Title of Posting." Online posting. Date. Name of listserv. Date of access <electronic address>

Electronic Database (such as Newsbank, Ethnic News Watch, or Broadcast News)

Provide bibliographic data for the original source and then add the name of the database along with relevant data (such as version number and/or transcript)

Pre-Interview Conference Sheet

Name _____

Who are you interviewing? _____

Why did you choose this person? Who led you to find this person or how did you find out about him/her? What do you expect this person to know that will help your character's point of view?

_____

_____

_____

_____

How do you intend to record the information you learn? (Note-taking, videotaping, audiotaping?)

_____

_____

_____

What questions will you ask?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Date, time and location of interview?

_____

_____

_____

_____

_____

If more space is needed, please continue on the back.

Post-Interview Conference Sheet

Name _____

Set up the biographical information for your interview by listing name (last name, first name) Personal Interview and date (day month year). If the interview was by phone you should enter it as Telephone Interview instead of Personal Interview.

What usable information did you learn? It's okay to list facts rather than write sentences.

Now it's time to write sentences. Summarize the information you've learned.

How does the information you've learned support or change what you already know?

If more space is needed, please continue on the back.

Name _____

Analyzing and graphing your data.

1. What is the name and occupation of your character?

_____

_____

2. Briefly explain your character's point of view.

_____

_____

_____

3. Describe the data you have collected. (Be sure to set up biographic information for your data source.)

_____

_____

_____

4. How do you expect the data to support your character's point of view?

_____

_____

_____

5. Choose a table or graph that will most effectively display the data:
   Table/chart: data are displayed in columns and rows
   Bar graph: compares quantities
   Line graph: shows change over time
   Circle graph: compares parts to the whole

6. Choose a title that conveys the meaning of your graph to the reader.

_____

_____

7. Label each axis.

8. In a paragraph, summarize the important facts contained in your graph/table. Explain how the data do or do not support your character's point of view.

_____

_____

_____

_____

_____

Student worksheet to write the Debate/Discussion Position Notes

This is not your research paper or final project. In class, we are going to hold a debate/discussion on whether the Amazon rain forest will be turned into a world preserve. You will each have a chance to introduce your character and give his or her opinion on that question. The notes you prepare for this should be short and strong. Include your occupation, your interest in the rain forest, your strongest points supporting your view and a clear closing opinion statement. These notes and the graph/chart you make are the only information you will be allowed to have in your possession, so include any information for yourself that you will need to argue your character's point of view correctly and convincingly. After each student has had a chance to present his/her opinion, students will be expected to question participants on their views and argue their own in a general classroom discussion/ debate atmosphere. Your beginning speaking time will be uninterrupted, but you'd be smart to jot down notes while others speak so that you can participate and question later.

Special notes about debating:

- Questions are not proof. You can't ask, "How do we get coffee then? Are we to ask everyone to give it up?" That's not proof. It puts the work on to the other debater. You must have the information to prove that your way is the best way – not put the work on another.
- Even though this will be a discussion rather than a formal debate and you will not be given precise amounts of time to speak or rebut other speakers, you need to support all of your assertions or opinions with facts. Others may call you on simple opinions, generalizations, stereotypes, information based on poor sources, biased sources, and poor conclusions drawn from facts.

Final Evaluation of Unit

You have done extensive research on the rain forest. For your final evaluation, you are to write an expository paper that follows the State of Ohio Proficiency Guidelines. List and discuss 3 different ways humanity influences the survival of the rain forest and 3 different ways the rain forest influences the survival of humanity. Remember to include a strong opening paragraph, necessary supporting details and a solid conclusion.

You will be graded using this rubric:

Suggested Evaluation Rubric of Final Test

_____ Introduction (10 points)

_____ Statement and explanation of three ways in which humanity influences the survival of the rain forest (40 points)

_____ Statement and explanation of three ways in which the rain forest influences the survival of humanity (40 points)

_____ A summary that illustrates a change in personal view or an increase in knowledge (10 points)

Miner

- P. Clementine
- Born in the U.S.A.
- U.S. citizen
- Works for a U.S. international mining company
- Mines for gold
- Head of the Department of New Resources

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *Garimpeiros, gold, gold mining and rain forest, mercury toxicity, South American mining, iron ore*

To narrow your search: *Where the words rain forest or South American appear, try substituting Ecuador, Peru, and/or Brazil.* ***For example:*** *"gold mining in Peru."*

Shaman

- R. Gonzales
- Medical and spiritual healer (herbalist) for a specific village
- Age 45
- Born along the Amazon River in Iquitos
- Education: apprentice

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *shaman, medicine man, healer, Yagua, Riberenos, Aguaruna, Kayapo, Mehinaku, Waimiri-Atroari, Amazonian Indians, Mestizo, Don Antonio Montero Pisco*

Science Teacher

- P. Zammer
- 8th grade science teacher in Ohio
- Has worked with Los Amigos during the summers for the last 10 years

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *Los Amigos, ecology, deforestation, green house effect, biodiversity, endangered species, rain forest harvest, rain forest preservation*

To narrow your search: *Where the words rain forest or South American appear, try substituting Ecuador, Peru, and/or Brazil.* ***For example:*** *"ecology in Peru."*

Pharmacist

- H. Dietrick
- From Sweden
- Has leukemia
- Age 30 with 2 children

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *ethnobotany, herbal remedies, rain forest medicine, pharmacology, curare, rain forest remedies*

To narrow your search: *Where the words rain forest or South American appear, try substituting Ecuador, Peru, and/or Brazil.* ***For example:*** *"pharmacology in Peru."*

Rancher

- S. Brush
- Born and raised in Brazil
- Ranch worker hoping to own his own cattle ranch

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *Brazil, Brazilian agriculture, cattle ranching, slash-and-burn, chemical fertilizers, deforestation, gauchos, rain forest clear-cutting, erosion in the Amazon, Brazilian agriculture, Brazilian beef, Agrosoft online, rain forest products*

Coffee Company Representative

- Y. Rodreguiz
- Born and raised in Brazil
- Works for agriculture department
- Responsible for coffee production for the Brazilian government
- Researching ways to grow coffee as a sustainable crop

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *Coffee, Rain Forest Action Network, rain forest products, sustainable rain forest crops, growing coffee*

To narrow your search: *Where the words rain forest or South American appear, try substituting Ecuador, Peru, and/or Brazil.* ***For example:*** *"coffee in Peru."*

Native Person

- S. Sanchez
- Age 16
- Born along the Amazon River in Peru
- Went to school through Grade 5 and is now weaving thatch for roofs that are sold in the city

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *Amerindians, Yugua, Kayapo, Riberenos, Aguaruna, Mehinaku, Waimiri-Atroari, Amazonian Indians, Mestizo*

Pet Shop Supplier

- I. Gambel
- Collects freshwater tropical specimens and rare birds for sale outside of South America
- Sells primarily to exotic pet stores

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *Endangered species, collecting tropical fish, exotic birds, Macaw, parrot, piranha, tarantula, iguanas, import of animals, export of animals*

Additional Suggestions: *Contact a local veterinarian and/or the owner of a pet store.*

Lumber Company Representative

- N. Teak
- Born and raised in Brazil
- In charge of exports for a major Brazilian lumber company

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *mahogany, deforestation, teak, Earth Summit 1992, Mato Grosso, slash-and-burn, Southern Para, Rondonia, forestry facts*

Fast Food Chain Executive

- R. King
- Born and raised in Texas, U.S.A.
- Wants to purchase land to raise cattle

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *cattle ranching, slash-and-burn, deforestation, gauchos, rain forest clear-cutting, rain forest soil depletion, erosion in the Amazon, Brazilian beef, Brazilian cattle market, Agrosoft online, rain forest products, fast food chain names, imported beef and South America*

To narrow your search: *Where the words rain forest or South American appear, try substituting Ecuador, Peru, and/or Brazil.* ***For example:*** *"ranching in Peru."*

Anthropologist

- J. Badsome
- Born and raised in Ecuador
- Studying the cultures of the rain forest peoples

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *rain forest culture, religions and South America, native art and music, tribal ceremonies, artifacts, rituals, creation myths, folklore, Yagua, Riberenos, Aguaruna, Kayapo, Mehinaku, Waimiri-Atroari, Amazonian Indians, Mestizo*

To narrow your search: *Where the words rain forest or South American appear, try substituting Ecuador, Peru, and/or Brazil.* ***For example:*** *"forklore of Peru."*

Peruvian Ambassador to the World Council

- P. Munoz
- Born and raised in Peru
- Represents Peruvian interests on the key question

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *Peru, Peruvian economy, Peruvian trade, Peruvian exports and imports, Peruvian nature preserves*

Local Medical Doctor

- J. Bournaise
- Supplements local medical practices with modern medical practices
- Received medical degree in Paris, France
- Worked in Paris for ten years before moving to South America

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *Linnea Smith, homeopathic medicine, ethnobotany, pharmacology, alternative treatments, herbal remedies, rain forest medicine, curare, Red Cross*

Ethnobotanist

- Professor B.T. Gap
- College professor from the University of Michigan
- Studying the local flora in search of new medicines and the active ingredients in local remedies

Key Words can be used for searching the Web and for using print resources such as the encyclopedia and the library card catalog.

Suggested key words: *pharmacology, compounding, alternative treatments, herbal remedies, rain forest medicine, curare, rain forest remedies*


AMA-ZONE!
ANTHROPOLOGIST


AMA-ZONE!
COFFEE COMPANY REPRESENTATIVE


AMA-ZONE!
ETHNOBOTANIST


AMA-ZONE!
FAST FOOD CHAIN EXECUTIVE


AMA-ZONE!
LOCAL MEDICAL DOCTOR


AMA-ZONE!
LUMBER COMPANY REPRESENTATIVE


AMA-ZONE!
MINER


AMA-ZONE!
NATIVE PERSON


AMA-ZONE!
Peru
PERUVIAN AMBASSADOR


AMA-ZONE!
PET SHOP SUPPLIER


AMA-ZONE!
Rx
PHARMACIST


AMA-ZONE!
RANCHER


AMA-ZONE!
SCIENCE TEACHER


AMA-ZONE!
SHAMAN

Glossary

Abiotic — not living

Adaptation — feature that allows an organism to survive in its environment — can be passed on to future generations

Atmosphere — air surrounding the earth

Biodiversity — the variety of plant and animal species in an environment

Biosphere — part of the world where life can exist

Carnivore — animal that subsists on (eats) animal tissue

Clear-cutting — all trees from a given area are removed

Climate — weather at a place over a period of time — includes temperature, precipitation, and wind

Climax Community — last stage an environment goes through

Clinometer — tool for measuring the number of degrees in an angle

Consumer — consumes or eats a producer or another consumer

Decomposer — an organism that breaks down dead organic material and returns nutrients to the environment

Ecosystem — all plants, animals and physical conditions in a particular climate.

Epiphytes — plants that live on another plant but do not depend on it for water or nutrients

Ethnobotony — study of how humans of different cultures use plants

Food Chain — linked series of living things, each of which is the food for the next in line

Food Web — a complex network of food chains

Herbavore — animal that feeds only on plants

Hydrosphere — water and vapor in the atmosphere

Lithosphere — outer layer of the earth

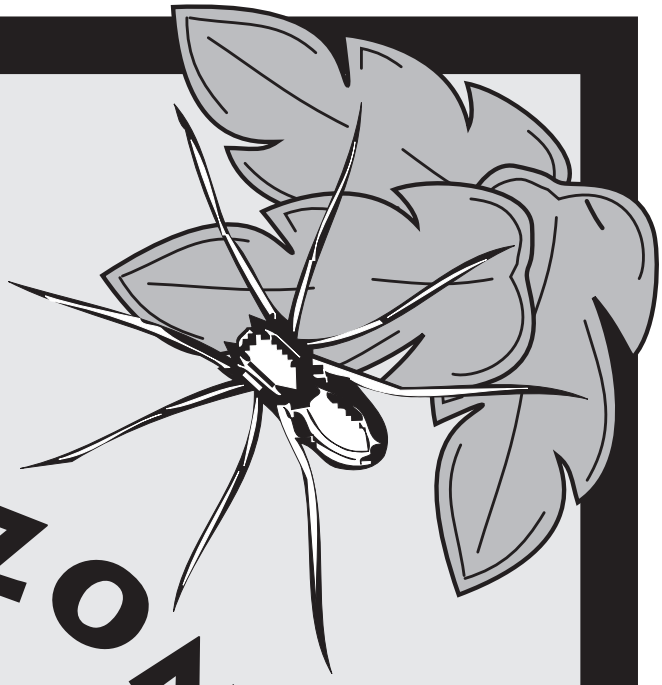
Omnivore — animal that feeds on both animal and vegetable substances

Producer — green plants that make their own food by photosynthesis

Tangent — ratio of the opposite to the adjacent sides of a right triangle

Tropical Rain Forest — dense broadleaf forest lying near the equator with an annual rainfall of 100 inches or more

Weather — daily temperature, precipitation, and wind



AMA-ZONE!

The Rain Forest Project

Science Projects

http://wneo.org/ama-zone

Part 2 — Procedures for Using the Science Lessons

Goal

The main goal of the science lessons is for students to understand basic scientific concepts about the rain forest. These concepts include biodiversity, classification, the interrelationship among species, rain forest products, weather, deforestation, adaptations, and the differences between plants and animals.

All lessons can be used or they can be used independent of one another. The selection of topic, approach, and order of the lessons is determined by the teacher. Lessons can be used to supplement weak student areas while the simulation is occurring or they can be used in place of the simulation.

Graph It! (Layers of the Rain Forest) allows students to gain an understanding of the layers of the rain forest. They will make a comparison between the local environment and the environment in the rain forest, and then graph the results.

Diversity! (Biological Diversity in the Rain Forest) has students simulating biodiversity and graphically illustrating the effect of clear-cutting forest areas locally and in the United States. This lesson could also be done as a teacher demonstration.

Where Does It Belong? (Classifying Rain Forest Organisms) gives students the opportunity to classify rain forest plants and animals based upon attributes that they display.

Hungry? (Interrelationship Among Forest Species) is designed to lead students to an understanding of the interrelationships among forest species. A food chain is created by the students after the following vocabulary words are learned: producer, consumer, decomposer, carnivore, omnivore, and herbivore.

How Long Will It Take? (Deforestation) allows students to use data that tell the speed of the reduction of the rain forest and determine how long it would take to destroy their own community at the same rate of destruction.

Scratch 'N Sniff (Rain Forest Products and Your Senses) is designed to see if students can use their senses to identify rain forest products. The students can then graph the results to check their accuracy in determining the identity of the product.

Weather-Here & There (Comparison of Temperate and Tropical Rain Forests) is designed to lead students to an understanding of the differences between weather in the tropical rain forest(s) and the temperate, deciduous forests. Students will also become aware of the abiotic (non-living) factors that determine the climax community of an area.

What Does *The Lorax* **Know? (*The Lorax* Teaches the Concept of Deforestation)** involves first reading the Dr. Seuss book, ***The Lorax***. In this book a mythical country is dying because all the trees are being cut down. This story is then used as a starting point for discussion and writing about the concept of deforestation.

Changes, Changes, Changes! (Adaptations) asks students to find and describe plants and animals that have made adaptations and how these adaptations have allowed species to survive.

Game Day? (Differences Between Plants and Animals) has students making a game to teach either young children or their peers about the differences between plants and animals.

Graph It!

Layers of the Rain Forest

Concept

The students will gain an understanding of the layers of the rain forest. They will make a comparison between the local environment and the environment in the rain forest.

Objectives

The student will:

- Use a trigonometry function (tangent) to determine the height of a tree.
- Make a graph comparing the height of a local tree and the height of the layers of the rain forest. (6th-grade mathematics objectives #21 and #22; 9th-grade mathematics proficiency objective #12)

Material

- graph paper
- clinometer
- straight edge
- markers
- Student Activity Sheet #1 **Calculating the Height of a Local Tree**

Procedures

1. Break students into pairs.
2. One person will use clinometer to measure the angle to the top of the tree.
3. The second person will read the angle measure on the clinometer while the first person holds it.
4. Students will use the tangent function to find the height of the tree they measured

$$\tan = \frac{\text{opposite}}{\text{adjacent}}$$

5. Students will find the height of the trees/plants of the four layers of the rain forest: emergent layer, canopy layer, understory layer and forest floor using available reference material (Internet, print material, teacher information or Videos 1 and 3)
6. Partners will make a graph that shows the height of the local tree and the trees/plants of the four layers.
7. Partners could share graphs and interpretations with the class.
8. Optional: Using information from Video 3 and facts you got from the Internet, graph the layers of the rain forest, compared to average height of trees in the temperate rain forest.

Evaluation

- Correctly use the tangent function.
- Correctly graph the height of the four layers of the rain forest
- Graph should show
  - Title
  - Correct intervals on each axis
  - Label for each axis
  - Neatness/good appearance
- Students should write a paragraph explaining contents of their graph

Evaluation Rubric

4 Student presents the graph with a clear explanation. Fact statements are used in the explanation. Grammar, punctuation, and spelling are generally correct. (e.g. The trees of the emergent layer of the rain forest are six times the height of the local tree.)

3 Student makes a clear explanation of the graph in words but does not include mathematical data. (e.g. The trees of the emergent layer of the rain forest are taller than all of the other layers.) Grammar, punctuation, and spelling are generally correct.

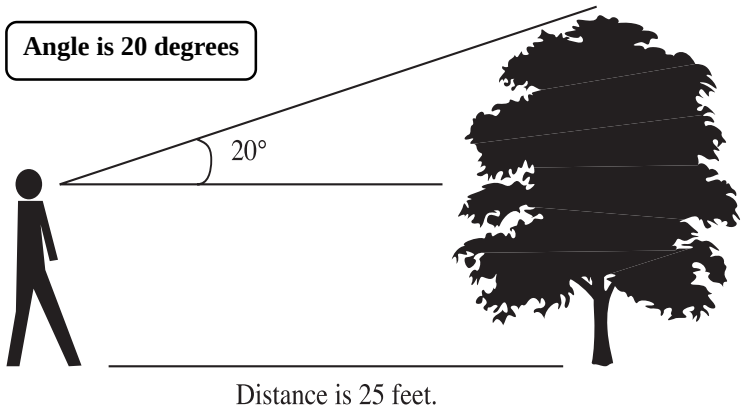
2 Student has some idea of the concepts set forth in the graph but explanation and examples are weak. (e.g. There is a difference in the height of the trees in the rain forest and those that are local.)

1 Student lacks a clear concept of the layers of the rain forest and the comparison with local trees.

Resources:

Students can find information on this topic by viewing Videos 1 and 3 and can see photographs and/or hear sounds dealing with this experiment on the CD in the section titled Rain Forest. The Web can be searched at **http://wneo.org/ama-zone** in the areas of General Topics, Plant Life — Ethnobotony, Animal Life and Miscellaneous or by using key words in a search engine.

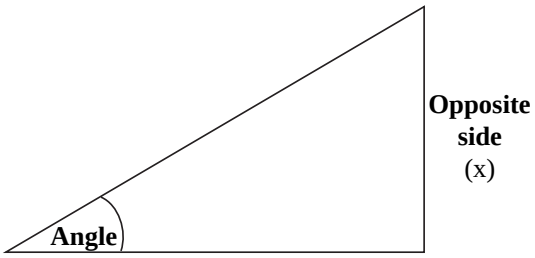
Calculating the Height of a Local Tree



To find the height of the tree, you would…

- Measure the distance from your foot to the base of the tree.
- Use your clinometer to measure the angle to the top of the tree. (See below how to make a clinometer.)
- Use the tangent function to determine the height of the tree.

For example: Angle is 20° Tangent of 20° = .364
Distance from foot to trunk of tree is 25 feet.



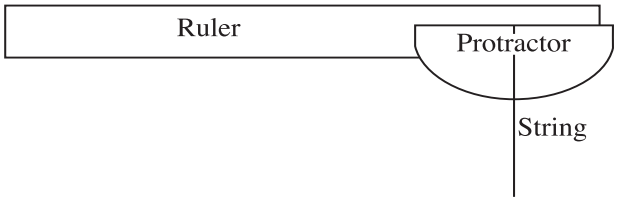
Height of the tree = x Tan 20°= $\frac{\text{Opposite}}{\text{Adjacent}}$

.364 = $\frac{X}{25 \text{ Feet}}$

X = .364 x 25 = 9.1 feet

To Make a Clinometer

- Put a protractor at the end of a ruler.
- Put a string at the foot of the protractor.
- Sight up the ruler. Where the string goes on the protractor when you sight up is the number of degrees. You read this from the protractor.
- Convert the number of degrees by using a scientific calculator and inputing “tan” and then the number of degrees.s



String will show tangent angle on the protractor.

Diversity

Biodiversity in the Rain Forest

Introduction

This lesson allows students to simulate biodiversity and graphically illustrate the effect of clear-cutting forest areas locally as well as in the tropical rain forest.

Objective

Explain biodiversity in terms of the transmission of genetic characteristics. (9th-grade science proficiency outcome #15)

Materials

Prepare a set of these materials for every cooperative group of students or do as a demonstration on overhead projector.

- 2 small transparent trays
- 10 yellow marbles, 10 red marbles, 10 green marbles, 10 blue marbles
- 40 other marbles in various colors and patterns, no two alike

Procedures

- Place the yellow, green, blue, and red marbles in a paper bag and shake them up.
- Pour them into one of the clear trays.
- Place the other 40 marbles in the paper bag, shake it up and pour into other tray.
- Instruct students to imagine that the yellow, green, blue, and red marbles represent oak, maple, elm and walnut trees growing in a deciduous forest like those found in Ohio.
- Students should think of the second tray of marbles as the rain forest, with each of the various different marbles representing different species of trees that only grow in this biome.
- Ask the students to focus on the great diversity of species (biodiversity) in the rain forest tray as compared to the small amount of diversity in the deciduous forest tray.
- Ask them to act like lumberjacks and cut down half of each of the forests. They do this by removing all the marbles on one side (right) of each tray.
- Point out that even though you harvested the same number of trees in the deciduous forest as you did in the rain forest, you haven't wiped out any species at all. There are still oak, maple, elm, and walnut trees growing in the other half. However, you removed species in the rain forest that do not exist in the other half left untouched by the ax of the lumberjack. These may not occur anywhere else in the world.
- Students should investigate examples of species that live in the rain forest.

Evaluation

Students will be able to explain the concept of biodiversity by writing a paragraph explaining this concept and by giving examples of rain forest plants and animals.

Evaluation Rubric

4 Students provide a clear explanation of biodiversity and illustrate it with examples from the rain forest.

3 Students provide a clear explanation of biodiversity with no examples.

2 Students have some idea of the concept of biodiversity, but explanation and examples are weak.

1 Students lack a clear concept of what biodiversity is.

Resources:

Students can find information on this topic by viewing Videos 1 and 3 and can see photographs dealing with this experiment on the CD in the sections titled Rain Forest, Bugs, Plants, and Animals. The Web can be searched at **http://wneo.org/ama-zone** in the areas of General Topics, Plant Life, Animal Life, Insects and Miscellaneous or by using key words in a search engine.

Where Does It Belong?

Classifying Rain Forest Organisms

Introduction

In this activity students will find 20 rain forest organisms and group them based on the criteria of their choice.

Objective

The student will:

- Devise a classification system for a set of objects or a group of organisms. (6th-grade science proficiency objective #1; 9th-grade science proficiency objective #1)
- Compare and contrast the characteristics of plants and animals. (9th-grade science proficiency objective #14)

Materials

Student Activity Sheets #2 and #3 **Where Does It Belong?**

Attribute blocks (polygons of different colors)

Children's toy blocks

Procedure

1. Teacher will present attribute blocks to the students. Using the overhead, a computer, or some other means of projecting information, teacher will sort the attribute blocks according to common characteristics. For example, all three-, four-, or five-sided shapes could be combined. Then they could be sorted by color; and then by size. This is to present the concept of classifying objects.
2. Break the students into pairs or groups of three.
3. Cut out the pictures on worksheet #2 or have students find their own pictures.
4. Group the pictures based on common, observable characteristics. These characteristics can include body coverings (feather, fins, scales), color, size, plants or animals, wings, mobility (walk on four legs, two legs, slither), etc.
5. Label each list with the heading of how the animals were grouped. Now sort or glue each organism under the proper category.

Optional procedure: Cut out and glue on to Activity Sheet #2 additional organisms that might fit into these categories.

Evaluation

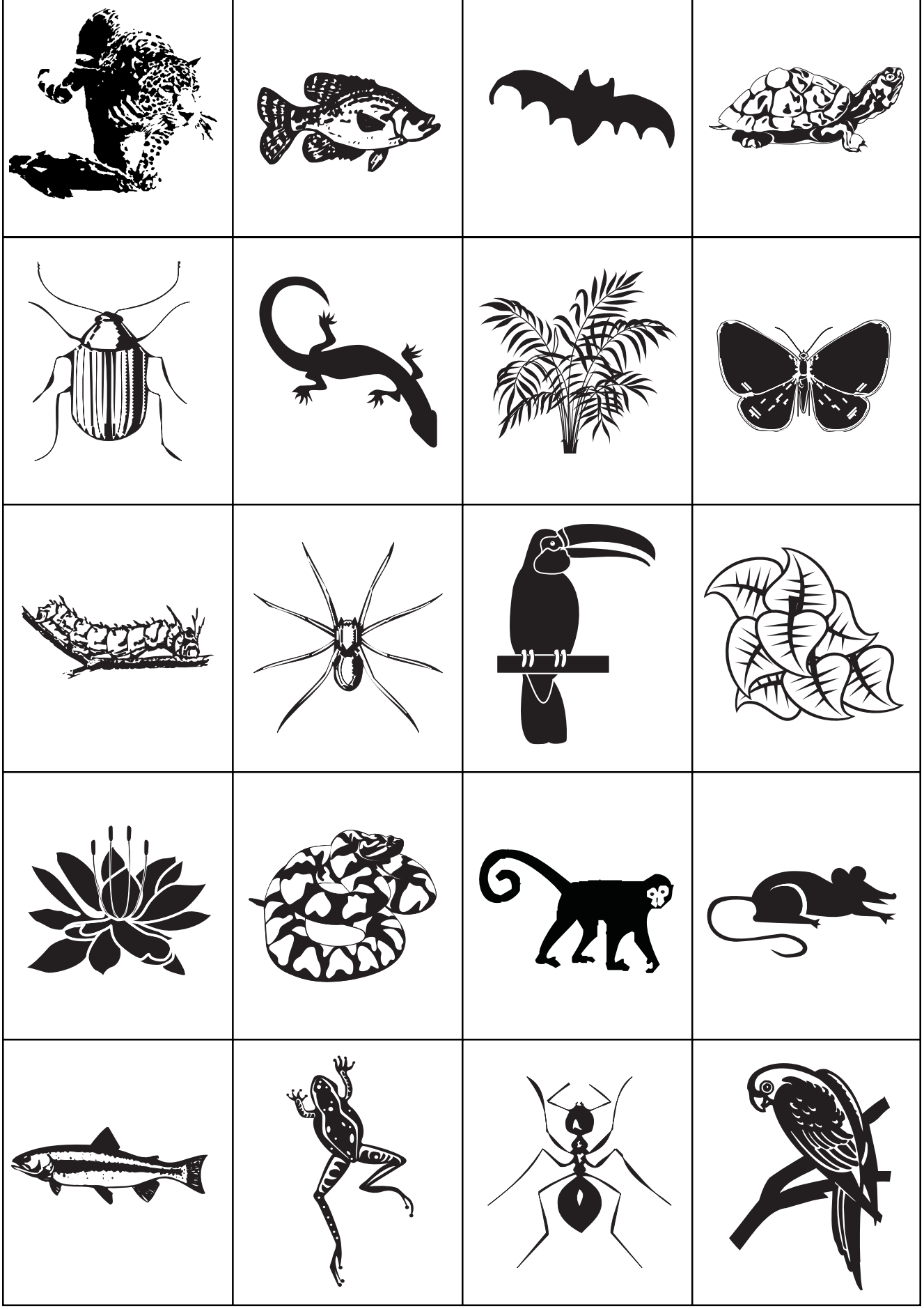
Each group should submit 20 pictures of rain forest organisms and show four sketches of how they grouped the organisms.

Extension

1. Make a dichotomous key for each classification system used above.
2. Require the groups to locate only 10 pictures of rain forest organisms and ask them to find more detailed information about the organisms. Students will then group the organisms based on more detailed information, such as eating habits, morphology, social behavior, habit, etc.

Resources

Students can find information on this topic by viewing Video 3 and can see photographs and/or hear sounds dealing with this experiment on the CD in the sections titled Rain Forest, Bugs, Plants, and Animals. The Web can be searched at **http://wneo.org/ama-zone** in the areas of General Topics, Plant Life, Animal Life, Insects, Fish and Miscellaneous or by using key words in a search engine.



Where Does It Belong?

Name _____

_____ Category 1	_____ Category 2	_____ Category 3

Hungry?

Interrelationships Among Rain Forest Species

Introduction

This activity is designed to lead students to an understanding of the interrelationships among rain forest species.

Objectives

The students will:

- Define a food web and a food chain.
- Use reference materials (Internet, periodicals, etc.) to define *producer, consumer, decomposer, carnivore, omnivore,* and *herbivore.* (See Glossary, page 50)
- Illustrate their ability to determine the relationships among various rain forest species.
- Trace the flow of energy through a rain forest ecosystem (9th-grade science proficiency outcome #13).

Materials

- a variety of reference materials
- 3 X 5 cards (one per student)
- writing utensils
- kite string, yarn, etc.
- imaginary organism cards or worksheet (see *Evaluation)*
- Student Activity Sheets #4 and #5 **Hungry?**

Procedures

- Each student will be assigned (random or choice) a rain forest organism to research. His/her research will be limited to defining the words *producer, consumer, decomposer, carnivore, omnivore,* and *herbivore* and to identifying the organisms' method(s) of obtaining energy. For example, a macaw would be classified as an herbivore.
- He/she will research the specific organisms that are eaten by the assigned organism. This information will be written on a 3 X 5 card.
- Upon completion of the research, students will be relocated to a large area. The teacher may review the definitions of the various terms with the class as an introductory activity.
- They will also compare and contrast a *food chain* with a *food web.*
- The students will spread themselves randomly throughout the room. A producer will be identified and the teacher will "string" a food chain/web (who eats who) throughout the room. The teacher will follow the path of energy transfer from the plants to the animals and finally to the decomposers using the string in a continuous way to form a food web.

(Example: Sun ➞ Plants ➞ Herbavore ➞ Carnivore ➞ Decomposer)

Evaluation

The students will be given a series of organisms on cards. Each student will illustrate his/her understanding of food chains by building a food pyramid. (Student Activity Sheet #4)

Extension

Given a set of animals and an organizational chart, students will build a food web. (Student Activity Sheet #5)

Resources

Students can find information on this topic by viewing Videos 1, 2 and 3 and can see photographs and/or hear sounds dealing with this experiment on the CD in the sections titled Plants and Animals. The Web can be searched at **http://wneo.org/ama-zone** in the areas of General Topics, Plant Life — Ethnobotony, Animal Life, and Miscellaneous or by using key words in a search engine.

Hungry?

Name _____

Read the descriptions of all of the plants or animals listed below. Fill in the triangle at the bottom of the page. List where each plant or animal belongs in the food chain.

Leaf Cutter Ant

Lives in the tropics. Carries cut-up leaves and flowers overhead like umbrellas (so sometimes called Parasol Ants). Lives on a fungus crop of decaying leaf parts.

Jaguar

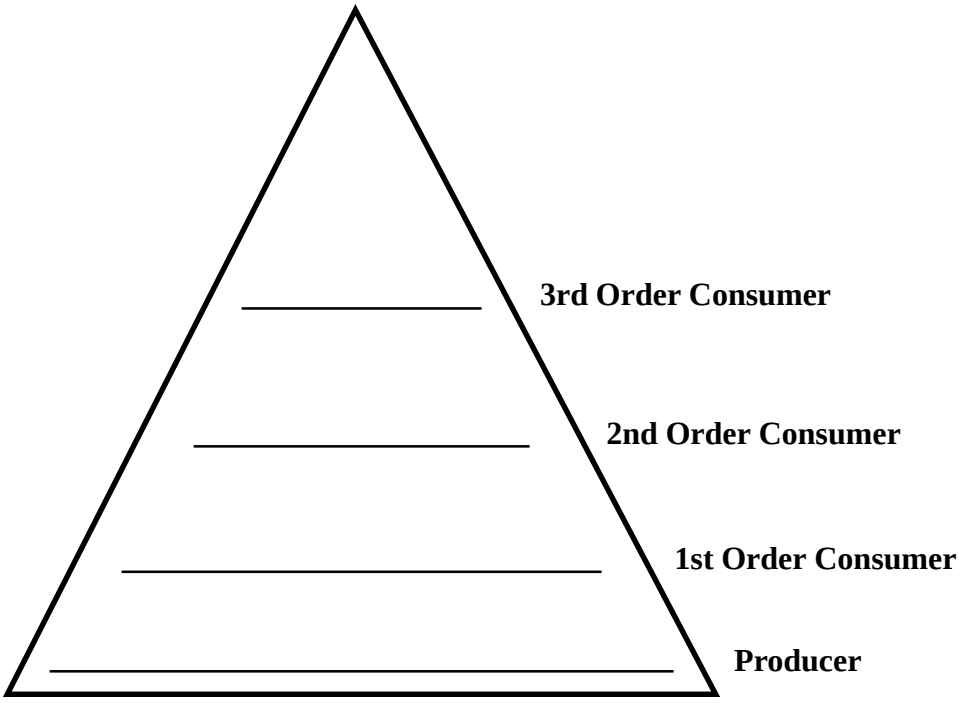
Cat family. Average 6 or 7 feet long. Large head and massive legs. Yellowish brown with black spots. Excellent swimmer. Meat eater.

Fig Tree

Grows 8 to 20 feet tall. Bears figs (fruit).

Anteater

Insect eating animal. Densely furred. Long tail. Mouth opening small but long sticky tongue.



Hungry?

Name _____

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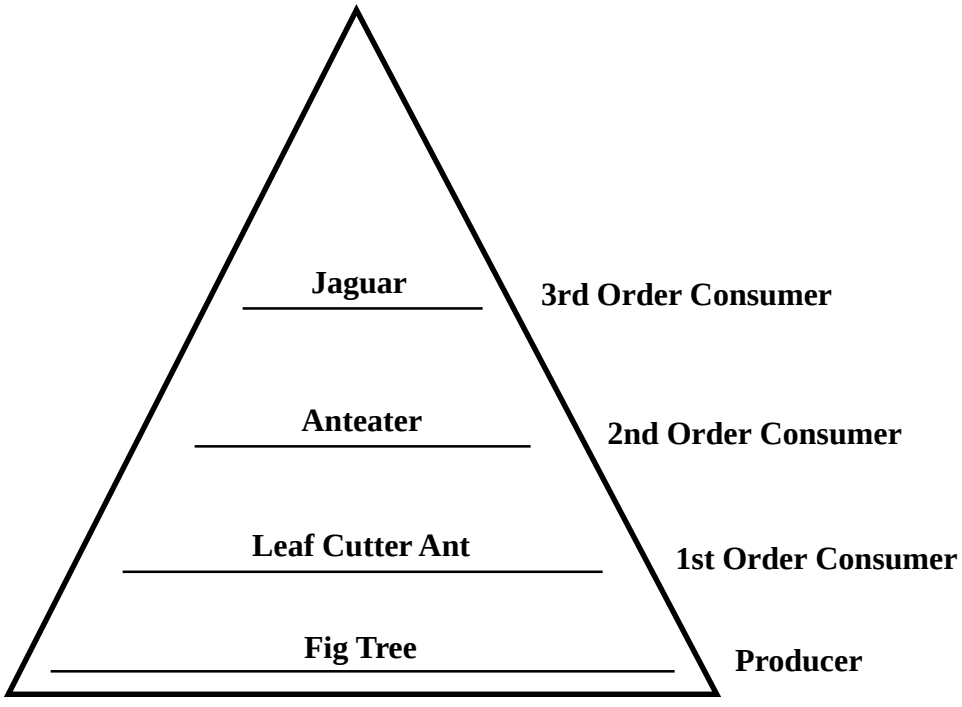
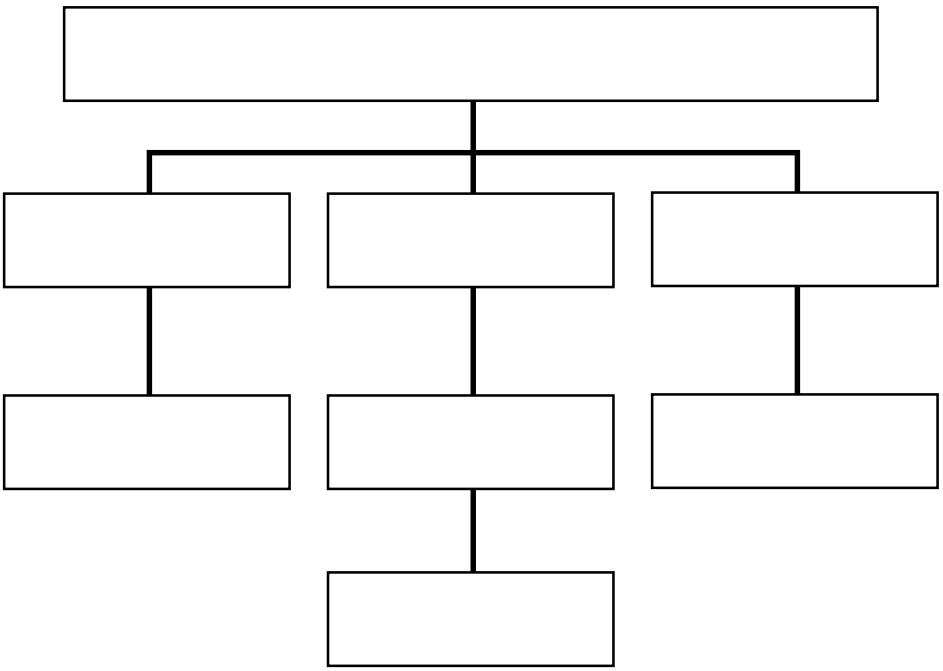


Hungry?

Name _____

Use the following plants or animals to fill in your food web: Parrot, Fruit Bat, Jaguar, Mountain Lion, Tree Boa, Porcupine, Fig Tree, Harpie Eagle

Food Web



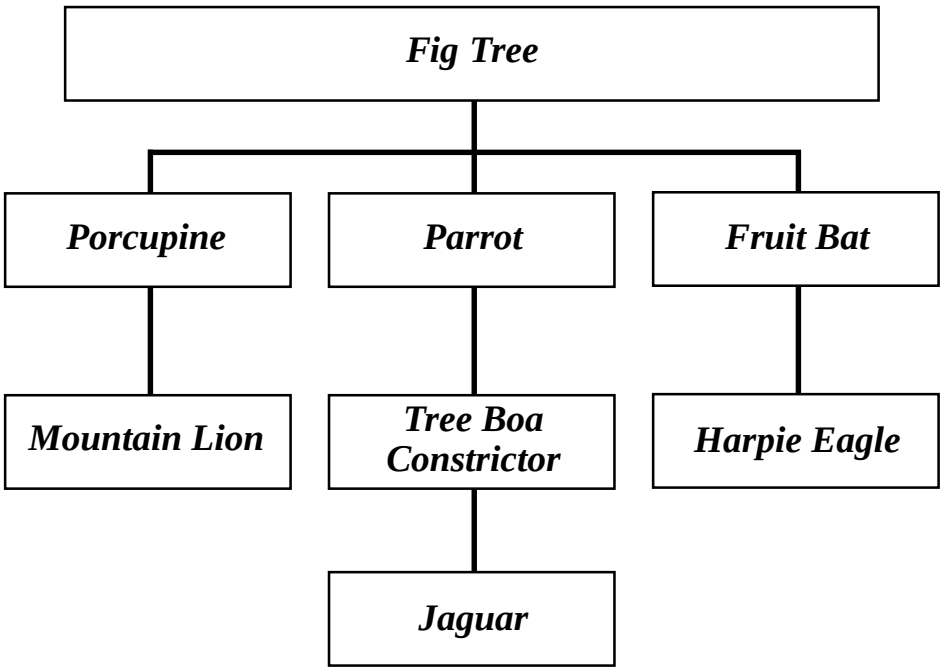
Hungry?

Name _____

Use the following plants or animals to fill in your food web: Parrot, Fruit Bat, Jaguar, Mountain Lion, Tree Boa, Porcupine, Fig Tree, Harpie Eagle

Possible Answer Key

Food Web



Scratch 'N Sniff ?

Rain Forest Products and Your Senses

Introduction

The following is an activity in which the students will identify rain forest products based on their own observations of the products.

Objectives

The students will:

1. Distinguish between observation and inference given a representation of a scientific situation. (9th-grade science proficiency objective #2)
2. Identify and apply science safety procedures. (6th-grade science proficiency objective #2; 9th-grade science proficiency objective #3)
3. Describe chemical and/or physical interactions of matter. (6th-grade science proficiency objective #8; 9th-grade science proficiency objective #12)
4. Use percent to compute and compare correct responses. (9th-grade mathematics proficiency #2)
5. Create a graph using data collected in the exercise. (6th-grade mathematics proficiency #21; 9th-grade mathematics proficiency #2)

Materials

- objects to "sniff" (e.g. chocolate, lemon)
- Student Activity Sheet #6 **Scratch 'N Sniff?**
- paper bags
- graph paper

Procedure

- Using safety guidelines, select several aromatic products from the rain forest. These products could include coffee, nutmeg, chocolate, pineapples, lemons, limes, paprika, cinnamon, oranges, bananas, pepper, allspice, cayenne, cocoa, vanilla, and orchids. Wafting a substance — using your hand to brush the smell toward your nose — is the proper way to sniff an unknown substance.
- Place each product into a paper bag.
- Label each bag with a number to identify that specific bag.
- Organize the bags so that students will either pass bags from one student to another or the students will walk from one bag to another.
- Teach or review the proper way to smell unknown substances.
- Hand out Student Activity Sheet #6.
- Have the students waft the contents of each bag and identify it.
- Students will write their "best guess" on Student Activity Sheet #6.
- When the entire class has identified the contents of each bag, compare your answers with the correct answers.
- In the appropriate column on Student Activity Sheet #6 students will place a check mark next to the number of each bag correctly identified.
- After the contents of the bags have been reviewed, the teacher will draw two tables on the board in the front of the room. Each table will have a column for the bag numbers and the other for checkmarks for correct responses. One table will be labeled CORRECT FEMALE responses and the other will be labeled CORRECT MALE responses.

- Students will compute percent correct for males and females and create a bar graph comparing the percent of correct female responses versus the percent of correct male responses for each unknown substance.

Evaluation

1. Completed individual student "Best Guess" paper.
2. Accurately completed bar graph comparing the correct percent of female versus male responses for each unknown substance. Graph should:

   include title

   have correct intervals on each axis

   have labels on each axis

   be neat and have a good appearance

Extensions

1. Touching. Unknown substances with different textures can be placed into the brown paper bags. Students will then be asked to identify the substances based on the texture. Liquids may need to be placed into jars inside the bags.
2. Tasting. Unknown substances with different tastes can be placed into the brown paper bags. Student will then be asked to identify the substances based on taste. Liquids may need to be placed into jars inside the bags. (Note: It is important to make sure that students do not have allergies to the tested substances.)

Resources

Students can find information on this topic by viewing Video 1 and can see photographs and/or hear sounds dealing with this experiment on the CD in the section titled Plants. The Web can be searched at **http://wneo.org/ama-zone** in the areas of General Topics, Plant Life — Ethnobotony and Miscellaneous or by using key words in a search engine.

Scratch 'N Sniff?

Name _____

Bag Number	Best Guess	Check if Correct
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

Weather — Here & There

Comparison of Temperate and Tropical Rain Forests

Introduction

This activity is designed to lead students to an understanding of the differences between weather in the tropical rain forest(s) and the temperate, deciduous forests. Students will also become aware of abiotic (non-living) factors that determine the climax community of an area (the step-by-step process environments go through until they reach their final stage — e.g. the rain forest).

Objectives

The students will be able to:

- answer the question, "Why did rain forests form?" Students will note the conditions that occur along the equator that led to the development of this diverse ecosystem. (6th-grade science proficiency objective #14)
- define *climate, weather,* and *climax community* as well as distinguish between biotic (living) and abiotic factors of an ecosystem.
- list a variety of interactions among the *lithosphere, hydrosphere, atmosphere,* and *biosphere* surrounding the rain forests. (9th-grade proficiency objective #7)
- collect data, create a table, picture graph, bar graph, circle graph, or line graph, and use it to solve application problem (the interaction of spheres). (6th-grade mathematics proficiency objective #21; 9th-grade mathematics proficiency objective #12)

Materials

- variety of reference materials — an Internet connection is needed to get current weather data
- weather data for tropical and temperate areas (including temperature, rainfall, relative humidity, etc.)
- graphing equipment (paper/program)
- Internet access

Procedures

- This activity may be conducted in small groups or individually.
- Teacher can provide information about temperate and tropical rain forest or students can do an Internet search to gather information about location and characteristics of each type of rain forest.
- Students will begin by collecting daily meteorological (weather) data of areas home to tropical rain forests and temperate forests. This information will be gathered during a brief daily research period. For example, students may use 10 minutes of class each day to gather information.
- Upon completion of the research period, the students will compile the data gathered into a chart or graph that clearly illustrates the characteristics of the two areas. This comparison should be mathematical in nature.
- Students will identify patterns or trends in the data and compose a written summary of their findings.
- The teacher will lead students in a discussion of the definition of the hydrosphere (water), lithosphere (land), atmosphere (air), and biosphere (plants). Students will then develop a list of interactions between at least two of the "spheres" directly related to the rain forest. For example, the rainfall (atmosphere / hydrosphere) directly influences the flora (biosphere) of the rain forest. The rain leeches the soil which has an effect on the type of plants that can grow. The discussion should clearly indicate the necessary interaction of the spheres.

Evaluation

- **Students may be evaluated on the successful completion of their graphs. These should clearly illustrate the difference between tropical rain forests and temperate forests. Graph should:**

  include a title

  have correct intervals on each axis

  have labels for each axis

  be neat and have a good appearance

  include a brief summary paragraph explaining what the graph displays

- Students will write a paragraph that discusses the necessary interaction of "spheres" as noted in discussion.

Evaluation Rubric

4 Students provide a clear explanation of the interaction of the various "spheres" and illustrate it with examples from the rain forest.

3 Students either provide a clear explanation of the interactions and no examples, or examples and no clear explanation.

2 Students have some idea of the concepts of interaction of the "spheres" but explanation and/or examples are weak.

1 Students lack a clear concept of the interaction of the "spheres."

Resources

Students can find information on this topic by viewing Videos 1 and 2. The Web can be searched at **http://wneo.org/ama-zone** in the area of General Topics or by using key words in a search engine.

What Does The Lorax Know?

The Lorax ***Teaches Concept of Deforestation***

Introduction:

This lesson allows students to use a children's book to demonstrate the effect of deforestation on the lithosphere, biosphere, atmosphere, and hydrosphere.

Science Proficiency Objective

The student will:

- describe the results of earth-changing processes.
- describe interactions of matter and energy throughout the lithosphere, biosphere, atmosphere, and hydrosphere. (9th-grade science proficiency #15)

Materials

- ***The Lorax*** by Dr. Seuss
- photographs showing rain forest after slash-and-burn

Procedure

- Prepare the story for reading to the class. Slides could be made of the illustrations or an Elmo document camera could be used to project pictures as the teacher reads the story.
- After reading the story, ask students some questions to engage a discussion. Sample questions:
  - What did Dr. Seuss have in mind when he wrote the book?
  - What message does the book convey to you?
  - Do children's books often have messages for adults as well as children?
  - What are the results of clear-cutting all the trees in the story (e.g. on the water, air, land, animals, and other plants)?
  - Where is deforestation taking place in the world today?
- Show students photos of devastated rain forest land that has been subject to slash-and-burn agriculture. Ask them how this relates to what is presented in ***The Lorax***. (Photos available on CD in the section titled Rain Forest.)

Evaluation

Have students write a journal entry in response to <u>one</u> of the following statements:

- Rain forests belong to all of the world's citizens and the clear-cutting must stop immediately.
- The United States has an obligation to model the good ecological practices it expects other countries (like rain forest countries) to follow. Cutting our ancient forests should be stopped.
- Ordinary citizens can make a difference in the preservation of the rain forest. The reasons that we should get involved are _____ .

Students should be able describe the result of deforestation. Write a paragraph explaining this concept using rain forest animals and plants.

Evaluation Rubric

4 Students write a clear explanation of the concepts involved in deforestation. Good examples are used.

3 Students either provide a clear explanation of deforestation and no examples, or examples and no clear explanation.

2 Students have some idea of the concepts of deforestation but explanation and/or examples are weak.

1 Students lack a clear concept of deforestation.

Resources

Students can find information on this topic by viewing Videos 1, 2, and 3. The Web can be searched at **http://wneo.org/ama-zone** in the areas of General Topics, Deforestation-Logging, Slash-and-Burn, Action Groups and Miscellaneous or by using key words in a search engine.

Changes, Changes, Changes!

Adaptations

Concept

Students will learn how adaptations of plants and animals allow them to survive in the rain forest.

Objectives

The student will:

- compare and/or contrast the diversity of ways in which living things meet their needs. (6th-grade science proficiency #15)
- describe how organisms accomplish basic life functions. (9th-grade science proficiency outcome #16)
- compare and contrast the characteristics of plants and animals. (9th-grade science proficiency outcome #14)
- make inferences from observation of phenomena. (6th-grade science proficiency objective #3)

Materials

- Internet access or CD-ROM
- computer set-ups (printer, word processor)

Procedure

- Teacher will discuss the concept of adaptation (any special feature that allows an organism to survive in its environment and is passed on from generation to generation).
- Students will go online or to a resource center and get a picture of a plant or an animal that has adapted to its environment. Some examples are:

  the long nose of an anteater

  the quills of a porcupine

  the drip tips of plants

  the long tail of a sloth

  the long beak of a hummingbird

- Students will make a copy of the picture they find, label the adaptive parts of the species, and write a description of the adaptation.

Evaluation

The correctly labeled pictures will be collected and used as part of the evaluation. A paragraph should be written that explains what the adaptation is and how it is used.

4 Students write a clear explanation of the concepts involved in the adaptation of the species. Good examples are used.

3 Students either give a clear explanation of adaptation and no examples, or examples and no clear explanation.

2 Students have some idea of the concepts of adaptation but explanation and/or examples are weak.

1 Students lack a clear concept of adaptation.

Resources

Students can find information on this topic by viewing Videos 1 and 3 and can see photographs and/or hear sounds dealing with this experiment on the CD in the sections titled Rain Forest, Bugs, Animals, and Plants. The Web can be searched at **http://wneo.org/ama-zone** in the areas of General Topics, Plant Life, Animal Life, and Miscellaneous or by using key words in a search engine.

How Long Will It Take?

Deforestation

Concept

Students will use data that tell the current rate of destruction of the rain forest and determine how long it would take to destroy their own community at the same rate.

Objectives

The student will:

- use ratio and proportion in a wide variety of applications. (6th-grade mathematics proficiency objective #10; 9th-grade mathematics proficiency objective #3)
- analyze the impact of human activity on the ecosystems of the earth. (6th-grade science proficiency objective #17)
- demonstrate an understanding of the use of measuring devices and report data in appropriate units. (9th-grade science proficiency objective #4)

Material

- four popsicle sticks for each group of students
- maps of community, county, or state for each group of students
- markers or pencils
- Student Activity Sheet #7 **How Long Will It Take?**

Procedures

- The teacher will tell the students that 300 square kilometers of rain forest are burned per day — or teacher could have students hunt for this information on the Internet.
- Break students into groups.
- So that we can use the maps we have, we will convert km to miles. The ratio is 8 km to 5 mi. Students will set up the proportion 8km : 5 mi as 300 km : x mi. (Answer is 188 sq. miles per day. For ease of use, we will round this to 200 sq. miles).
- Teacher will pass out maps of the community, county, or state to each group of students.
- Students will take four popsicle sticks and measure and glue them together to form a viewing box so that the interior of the four popsicles is a measure that matches the scale on your map.
- On the map of your community, begin marking off sections by holding your popsicle measuring device over the map and marking an “x” for each day it would take to destroy your community, county, or state.
- Record the total number of days it would take to destroy your community, county, or state.

Evaluation

Students need to turn in their map and a paper that answers the following questions:

How many days would it take to destroy your community, county, or state?

Using proportion, how long would it take to destroy your community, county, state, or the United States?

If 75,000 trees were in each square unit that you cleared, how many trees would be destroyed in your community, county, or state?

Resources

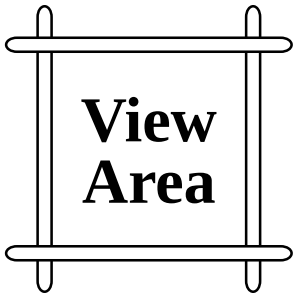
Students can find information on this topic by viewing Videos 1, 2, and 3 and can see photographs and/or hear sounds dealing with this experiment on the CD in the sections titled Rain Forest, Bugs, Animals, and Plants. The Web can be searched at **http://wneo.org/ama-zone** in the areas of General Topics, Deforestation-Logging, Slash-and-Burn, Plant Life — Ethnobotony, and Miscellaneous or by using key words in a search engine.

How Long Will It Take?

Deforestation

To make a viewing window:

- Glue four popsicle sticks together to make a viewing window.



- If the scale on the map says 1 inch = 10 miles, then the viewing area of the popsicle sticks should be 1 inch by 1 inch. This would represent 100 square miles on the map.
- Since 200 square miles per day are being destroyed, students would have to copy this twice to represent one day.

For easy use, the viewing area of the popsicle sticks should correspond to the scale of the map.

Game Day?

Differences Between Plants and Animals

Introduction

This activity is designed to lead students to an understanding of the differences between plants and animals. This could be done at the cellular level or with general characteristics.

Objectives

The students will be able to list five fundamental differences between plants and animals. They will be able to develop a creative method of teaching these differences in a game format (9th-grade science learning outcome #14).

Materials

- variety of reference materials — Internet, periodicals, books, etc.
- various supplies depending on student format — paper, glue, markers, computers, etc.
- Student Activity Sheet #8 **Game Day**

Procedures

- This activity may be conducted in small groups or individually. The variety of species of plants and animals present in the tropical rain forests will be used as an introduction to the lesson.
- Students will create lists of plants and animals found in the rain forest. This list will be generated during a research session in the resource center or technology laboratory.
- Each student should locate at least five species of plants and five species of animals from the rain forest. (This may be a good opportunity to discuss the development of *binomial nomenclature* and the correct use of scientific names. *Species name has two parts.* For example, man is homo sapien — homo being the genus and sapien the species name)
- The lists generated by students will be compiled on the board, overhead, or other means. Common characteristics of plants and animals will be garnered from these lists. Some examples include:

Animals

- Classify animals as mammals or arthropods
- Look at how food is gathered
- Look at how animals deliver their young — marsupials, eggs, etc.
- Body covering — feathers, fur, scales, etc.
- Locomotion — fly, walk with two legs, walk with four legs, slither, etc.
- Food consumption — fruit eater (herbivore), meat eater (carnivore)

Plants

- Epiphytes (never touch the ground)
- Reproduce by seeds or spores
- How they are pollinated — bees, insects, wind, etc.

Finally, students will create a game for younger students or peers to play. This game must address fundamental differences between plants and animals. These differences should have been identified during the previous discussion. Pass out Student Activity Sheet #8.

Evaluation

- Students may be evaluated on the successful completion of their lists of rain forest species.
- The final creation of a game that effectively teaches younger students or peers the differences between plants and animals should also be assessed. This may require a brief quiz (oral/written) of the students who played the game.

Evaluation Rubric for Game

4 Rules are clear. Directions are easy to follow. There is a goal to completion of the game. The game is neat in appearance and engaging. Game successfully teaches the difference between plants and animals.

3 Rules are clear. Directions are easy to follow. There is a goal to completion of the game. The game is neat in appearance and engaging. Game is not entirely successful in teaching the difference between plants and animals.

2 Rules are unclear or directions are difficult to follow. There is a goal to completion of the game. The game is neat in appearance. Game is not entirely successful in teaching the difference between plants and animals.

1 Rules are unclear or directions are difficult to follow. Goal to completion of game is dubious. Game may not be neat. Game not successful in teaching the difference between plants and animals.

Resources

Students can find information on this topic by viewing Videos 1 through 5 and can see photographs and/or hear sounds dealing with this experiment on the CD in the sections that relate to their game topic. The Web can be searched in the areas that relates to their game topic.

Game Day

Design an Educational Game

There are three types of games that you can create.

- A board game like Monopoly or Chutes and Ladders
- A lotto game like Bingo
- A paper and pencil game like a crossword

The object of your game is to review or to teach information about the difference between plants and animals to another student. You will trade your game on Friday and play each other's games, or you will go to a lower grade and play the game with younger students.

Directions

- Each game should have a set of written directions on how to play it.
- Each game should have a goal in mind like completing the puzzle or getting to "go."
- Each game should be neat and appropriate. Violence or offensive language is not to be a part of the game.
- Each game should teach the player the difference between plants and animals.
- Playing the game should be an enjoyable experience.

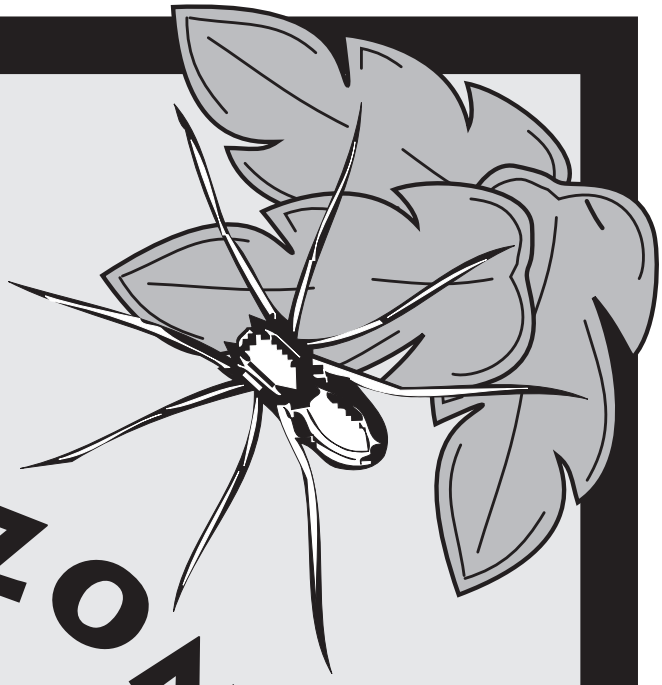
Some ideas for games

- Board games — move the pieces around the board to get to a goal site
- Lotto games — Fill in a line or corners and you win
- Paper and pencil games —
    - Crossword puzzles
    - Word Searches
    - Riddles
    - Cryptograms (hidden message using a code)
    - Rebus (using pictures to represent or spell out words or messages)
    - Logic problems
    - Matching (word to definition, word to word, word to picture, etc.)
    - Anagrams (word, phrase or sentence formed from another by rearranging the letters. "Angel" is an anagram of "glean")

Evaluation:

You will be evaluated on:

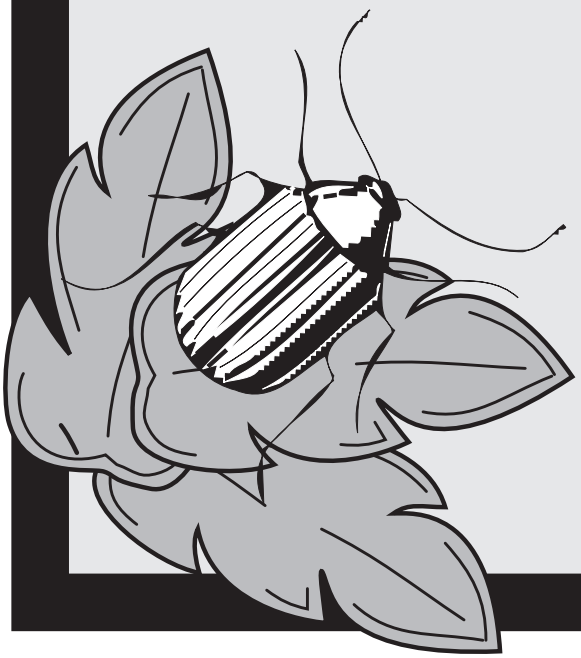
- the ability of the game to teach the difference between plants and animals. (This is the most important aspect of the project.)
- clarity of the rules.
- directions are easy to follow.
- a clear goal to complete the game.
- the game is neat in appearance.
- the game is engaging or fun to play.



AMA-ZONE!

The Rain Forest Project

Ohio Proficiency Objectives



Ohio Proficiency Objectives

The following learning outcomes will be met by all students doing the Rain Forest simulation. Other outcomes will be achieved depending upon the topic that is chosen by the student.

Writing:

Grade 6

The student will use the writing process to make the writing activities clear for the intended audience, as evidenced by the capacity to:

a. Focus on the topic with adequate supporting ideas or examples;

b. Exhibit a logical organizational pattern that demonstrates a sense of flow and conveys a sense of completeness and wholeness;

c. Exhibit word choice appropriate to the subject, the purpose and the intended audience;

d. Communicate clarity of thought

e. Use complete sentences except where purposeful phrases or clauses are desirable;

f. Write legibly using cursive or manuscript;

g. Demonstrate correct usage, correct spelling of frequently used words, and correct punctuation and capitalization;

h. Include sentences of varied length and structure.

Grade 9

The student will produce a piece of writing that

a. conveys a message related to the topic.

b. Includes supporting ideas or examples.

c. Follows a logical order.

d. Conveys a sense of completeness.

e. Exhibits word choice appropriate to the audience, the purpose, and the subject.

f. Includes clear language.

g. Contains complete sentences and may contain purposeful fragments.

h. Exhibits subject-verb agreement.

i. Contains standard forms of verbs and nouns.

j. Exhibits appropriate punctuation.

k. Exhibits appropriate capitalization.

l. Contains correct spelling

Graduation Competencies (Grade 10)

In particular, each piece of writing will:

1. Develop a clear, focused main idea or ideas related to the prompt.
2. Demonstrate completeness.
3. Include supporting details appropriate to the audience, purpose, and topic.
4. Follow purposeful organization.

5. Make connections among ideas, paragraphs, and sentences.
6. Use a variety of words appropriate to the audience, purpose, and topic.
7. Use a variety of sentence structures and/or phrases appropriate to the audience, purpose, and topic.
8. Exhibit standard conventions competently (mechanics, usage, grammar, and spelling).

Reading

Grade 6

Given a nonfiction text to read silently, learners will demonstrate an understanding of text and elements of nonfiction by responding to items in which they:

14. compare and/or contrast aspects of the text;
15. critique and evaluate the text for such elements as organizational structure and logical reasoning;
16. select information from a variety of resources to support ideas, concepts, and interpretations;
17. explain how an author uses contents of a text to support his/her purpose for writing.

Grade 9

Given everyday/functional reading materials, the student will identify, locate, and use information in items regarding

22. the selection and use of appropriate reference sources and illustrative materials.
    a. Examples of reference sources/illustrative materials would be dictionary, encyclopedia, almanac, atlas, phone book, card catalog, periodical/newspaper, schedule, table of contents, and index.
    b. Examples of skills/processes would be using alphabetical order; skimming and scanning; reading charts, tables, diagrams, graphs, maps, labels, and signs.
23. the meaning of vocablualry words used on an application form.
24. the use of propaganda.

Graduation Competencies (Grade 10)

Given a variety of selections, students will:

3. Recognize an author's purpose and attitude (bias/slant).
4. Support an interpretation by locating specific information.
6. Differentiate between fact and opinion.
12. Evaluate the effectiveness of resource material for a specified audience/purpose.

Mathematics

Grade 6

21. Collect data, create a table, picture graph, bar graph, circle graph, or line graph, and use them to solve application problems.
22. Read, interpret, and use tables, charts, maps, and graphs to identify patterns, note trends, and draw conclusions.

Grade 9

12. Read, interpret, and use tables, charts, maps, and graphs to identify patterns, note trends, and draw conclusions.

Graduation Competencies (Grade 10)

Students will:

2. Create, interpret and/or analyze tables, charts, and graphs involving data.

13. Choose and apply measures of central tendency (mean, median, and mode) and variability (range and visual displays of distribution).

15. Communicate mathematical ideas, reasoning, and solutions through the use of appropriate mathematical terminology, notations, symbols, definitions, models, and other representations.

16. Apply problem-solving strategies and evaluate processes, strategies, calculations, and solutions to verify reasonableness; and use mathematical reasoning to validate and/or generalize approaches, arguments, strategies, and solutions.

Citizenship

Grade 6

9. Interpret and analyze maps, charts, or graphs to formulate geographic ideas:

    b. determine and explain relationships among resources, economic activities, and population distribution

12. Describe the role of each factor of production in producing a specific good or service and suggest alternative uses of the resources involved.

13. Identify the factors that influence:

    a. consumer decisions to demand goods or services

    b. producer decisions to supply goods and services

14. Identify the factors that determine the degree of competition in a market and describe the impact of competition on a market:

    c. explain the general relationship between supply, demand, and price in a competitive market

Grade 9

The student will

5. demonstrate map-reading skills, including finding directions, judging distances, and reading the legend.

6. know the following economic concepts:

    b. individuals and societies make choices to satisfy wants with limited resources

    c. nations become interdependent through trade.

16. demonstrate the ability to use information that enables citizens to make informed choices.

    a. Use more than one source to obtain information.

    b. Identify points of agreement and disagreement among sources.

    c. Evaluate the reliability of available information.

    d. Draw conclusions by reading and interpreting data presented in charts and graphs.

    e. Identify and weigh alternative viewpoints

18. identify opportunities for involvement in civic activities.

Graduation Competencies (Grade 10)

Students will:

3. Use information about different cultures to explain the consequences of contacts between peoples from 1750 to the present by examining:
   a. patterns of migration
   b. exchanges of cultural practices (e.g., dress, language, music, art), and
   c. incidents of discrimination and conflict.
5. Utilize geographic resources to:
   a. locate places by consulting at least two references,
   b. describe relative location by using compass directions, time, and distance, and
   c. describe location by using formal reference systems.
7. Explain why regions and nations specialize in what they can produce at the lowest cost and then trade with other regions and nations.
12. Analyze civic issues by identifying:
   a. alternative points of view,
   b. relevance and reliability of information,
   c. potential impact on individuals, groups, or institutions, and
   d. ways to resolve issues applying the principles of fairness and justice.

Science

Grade 6

4. Identify the positive and/or negative impact of technology on human activity.
15. Compare and/or contrast the diversity of ways in which living things meet their needs.
16. Analyze behaviors and/or activities that positively or negatively influence human health.
17. Analyze the impacts of human activity on the ecosystems of the earth.

Grade 9

7. Describe interactions of matter and energy throughout the lithosphere, hydrosphere, and atmosphere. Explain materials of cycles (water, carbon, nitrogen), currents, and weather on the land, in the water, and in the air.
13. Trace the flow of energy and/or interrelationships of organisms in an ecosystem. Identify the food chain in a lake.
14. Compare and contrast the characteristics of plants and animals. Tell how plants and animals are alike and different.
15. Explain biological diversity in terms of the transmission of genetic characteristics. Explain why there are different breeds of dogs or kinds of plants.
16. Describe how organisms accomplish basic life functions at various levels of organization and structures. Describe a life function like digestion complete with the appropriate anatomy.
17. Describe the ways scientific ideas have changed using historical contexts.
18. Compare renewable and nonrenewable resources and strategies for managing them
20. Describe how a given environment change affects an ecosystem. Describe how a flood or drought affects plant and animal life.

Graduation Competencies (Grade 10)

Students will:

4. Given a particular scientific theory or protocol, explain how and/or why the theory or protocol may have changed over time.
9. Relate internal and external sources of energy in the Earth system to processes and cycles (e.g., air, water, land) occurring since the Earth's origin.
11. Relate changes in the form and distribution of matter to the cyclic and finite nature of resources within the closed Earth system.
13. Relate the chemical basis of life to heredity, diversity, species survival, adaptations, and extinction.
14. Relate heredity of organisms to the long term survival of populations based on mutations, variations in populations,and changes in populations as a result of differential reproduction.
15. Explain how living things interact with the living and non-living components of the environment.