



**Fourth Grade
Ecuadorian Rainforest**

National Standards for Grade Four Lessons

Language Arts Writing

Standard 4 Level 2 Grade 3-5

2. 3. 4. Gathers and uses information for research purposes (encyclopedias, dictionaries, electronic media).
Uses multiple representations of information (maps, charts, diagrams, tables) to find information for research topics.
7. Uses strategies to compile information into written reports or summaries.

Reading

Standard 7 Level 2 Grade 3-5

- Uses reading skills and strategies to understand a variety of informational texts.
5. Summarizes and paraphrases information in texts.
6. Uses prior knowledge and experience to understand and respond to new information.

Listening and Speaking

Standard 8 Level 2 Grade 3-5

- Contributes to group discussions.
Asks questions in class
Responds to questions and comments.
Listens to classmates and adults.
7. Makes basic oral presentations to class.
10. Organizes ideas for oral presentations.

Reading

Standard 6 Level 2 Grade 3-5

- Uses reading skills and strategies to understand and interpret a variety of literacy texts.
9. Makes connections between characters or simple events in a literary work and people or events in his or her own life.

Thinking and Reasoning

Standard 3 Level 2 Grade 3-5

4. Makes comparisons between countries in terms of relatively concrete characteristics (size, population, products).

Standard 1 Level 2 Grade 3-5

- Uses facts from books, articles and databases to support an argument.

7. Recognizes when a comparison is not fair because important characteristics are not the same.

Standard 5 Level 2 Grade 3-5

Identifies issues and problems in the school or community that one might help solve.

Mathematics

Standard 1 Level 2 Grade 3-5

Uses a variety of strategies to understand problem situations.
Represents problems situations in a variety of forms.

Standard 3 Level 2 Grade 3-5

7. Solves real world problems involving number operations.

Standard 4 Level 2 Grade 3-5

Understands the basic measures perimeter, area, volume circumference.
Selects and uses appropriate tools for given measurement situations.
4. Understands relationships between measures.
Uses specific strategies to estimate quantities and measurements.

Standard 9 Level 2 Grade 3-5

2. Understands that mathematical ideas and concepts can be represented concretely, graphically, and symbolically.

Life Science

Standard 6 Level 2 Grade 3-5

Knows the organization of simple food chains and food webs.
Knows the transfer of energy.
Knows that changes in the environment can have different effects on different organisms.
Knows that all organisms (including humans) cause changes in their environments and these changes can be beneficial or detrimental.

Standard 1 Level 2 Grade 3-5

Understands atmospheric processes and the water cycle.

Standard 4 Level 2 Grade 3-5

5. Knows that the characteristics of an organism can be described in terms of a combination of traits; some traits are inherited and others result from interactions with the environment.

Standard 5 Level 2 Grade 3-5

Knows that living organisms have distinct structures and body systems that serve specific functions in growth, survival, and reproduction. (Body structures for walking, flying, or swimming).

Standard 7 Level 2 Grade 3-5

3. Understand the concept of extinction and its importance in biological evolution.
Knows ways in which living things can be classified.

Standard 9 Level 2 Grade 3-5

Understands the sources and properties of energy.

Standard 11 Level 2 Grade 3-5

Knows that good scientific explanations are based on evidence (observations) and scientific knowledge.

Knows that scientists make the results of their investigations public.

Standard 13 Level 2 Grade 3-5

Knows that people of all ages, backgrounds, and groups have made contributions to science and technology throughout history.

Standard 12 Level 2 Grade 3-5

Plans and conducts simple investigations.

4. Uses appropriate tools and simple equipment.



Fourth Grade Ecuadorian Rainforest

Lesson 2: Why does the cacao tree need a tropical rainforest to grow?

Concept

Cacao plants have specific requirements to survive. Plants thrive naturally in different biomes. Growing conditions and requirements can be affected by human activity.

Essential Question

Why does the cacao tree need a tropical rainforests to grow?

Additional Resources

- **Resource Index** - Check out this page at <http://www.rainforest-alliance.org/programs/education/teachers/curriculum/resources/index.html> for additional supplemental materials that complement these dynamic units and to access many of the resources listed below.
- **Slideshow** – The Learning Site provides a slideshow and script about Ecuador that includes background information about the animals, people and landscape of this region. The slideshow can be downloaded for viewing in the classroom, printed out and read as a story, or viewed online with the students.
- **Unit-Specific Story:** The Rainforest Alliance has developed an original story for use with these units, available in English, Spanish and Portuguese. The story is available to download and print or can be viewed onscreen.

Romel's Rainforest Home

- **From the Bean to the Bar: Chocolate Slideshow** - Where does chocolate come from? Take a journey that that follows the production of a chocolate bar from the bean to your supermarket. The slideshow can be downloaded for viewing in the classroom, printed out and read as a story, or viewed online with the students.
- **Species Profiles** – The species profiles, available to view on screen or download from the beginning of the unit or the Resource Index, include photos, habitat, foraging behavior, group relationships, threats and many more facts.
 - Bromeliad
 - Ocelot
 - Great Curassow
 - Capuchin Monkey
 - Three-Toed Sloth

- **Rainforest Poster:** Download and print out this colorful two-page poster, which is available for you to use in explaining the layers of the rainforest, its products and the environmental threats facing many rainforests around the world.

Inside the Canopy – Structure and species of the rainforest

Status Report – What is happening to the rainforest

- **Terrarium Instructions** – Download directions for making a terrarium in your classroom.
- **Rainforest Products** – Visit <http://www.rainforest-alliance.org/resources/forest-facts/lives.html> for a summary of products found in our homes and supermarkets that either originated in tropical forests or are currently produced there.
- **Teacher summary/Chachi Community Profile** – The Rainforest Alliance Learning Site provides a downloadable overview of Chachi cocoa farmers in Ecuador with useful information to introduce you to the lesson topic.
- **Conservación y Desarrollo (Conservation and Development)** – Check out this online resource for more information about how the Rainforest Alliance’s partner group in Ecuador, *Conservación y Desarrollo*, is helping the Chachi protect their precious ecosystems:
<http://www.rainforestalliance.org/programs/aar/ecuador.html>
- **Profiles in Sustainability** – Visit <http://www.rainforestalliance.org/programs/profiles/index.html> for case studies on companies who work closely with the Rainforest Alliance to ensure that their practices protect wildlife, workers and communities.
- **Certificate of Accomplishment** – Print out colorful rainforest certificates for your students to commemorate their completion of these units.

Informational Introduction for Teachers

Biomes are large areas that have the same general climate conditions (extremes of temperature and amount of rainfall), plant life and animal life. Within biomes there are smaller bioregions that may have special characteristics, such as mountains, rivers, lakes, canyons and other physical features that can influence plant and animal life. Knowing these differences, one begins to understand the importance of keeping all biomes intact so that biodiversity is maintained.

Step 1 - CONNECT (The Concept to Prior Knowledge)

Challenge

Where does chocolate come from?

Students describe the story of a chocolate bar, including harvesting, processing, packaging and shipping.

Materials

- Research tools (Internet access, etc.)

Procedure

1. Students are introduced to a concept map before writing their stories.
Concept Mapping: As a whole class, with the teacher recording on the board, students learn to brainstorm answers to the question: Where does a chocolate bar come from?

Put the words "chocolate bar" in the center of a piece of paper and begin to record all the different responses to the question.

Prompts might include:

- a. origin of ingredients
- b. production/manufacturing sites
- c. different sources of transportation
- d. stores where it was bought
- e. packaging and its origins, etc.

This will create a sense of the full cost of the chocolate bar.

2. Have each student write a short story from the perspective of the chocolate bar.

Resources might include:

From the Bean to the Bar: Chocolate Slideshow

http://www.rainforest-alliance.org/programs/education/teachers/curriculum/ecuador/slideshow/cocoa_slideshow.pdf

This presentation, available from the Resource Index, takes you on a delicious journey that follows the production of a chocolate bar from the bean to your supermarket.

The Sweet Science of Chocolate

www.exploratorium.edu/chocolate

This Web site provides background information on the origins of chocolate, describes how to process cocoa beans and make chocolate bars and discusses the possible health benefits of eating chocolate.

Hershey's factory tour

http://www.hersheys.com/tour/pic_text/intro.htm

This Web site takes you through the path that Hershey's chocolate takes from the forest to the factory.

About Cacao trees, pods and seeds

<http://www.chocolate.org/choctree.html>

<http://home.howstuffworks.com/chocolate1.htm>

These sites give an overview of what the cacao tree looks like and what part of the tree chocolate is derived from.

Step 2 - LITERATURE/DISCUSS (Give Expert Information Book; Ask Questions)

Challenge

What do cacao trees need to survive?

Students will research cacao trees, focusing on the conditions necessary for growing the crop.

Materials

- Story: **Romel's Rainforest Home**, a Rainforest Alliance story
- Paper, pencils

Procedure

1. Read aloud: **Romel's Rainforest Home**, a Rainforest Alliance original story about a Chachi boy who lives in the northwest corner of Ecuador. Discuss the different living conditions of the rainforest that Romel and his family experience.
2. Have students talk about the conditions that exist in Romel's country that are necessary for the growth of the cacao tree.
3. Have students write a short biome story that describes the conditions of the rainforest from the cacao tree's perspective. What does the world look like from the perspective of the cacao tree? What does the tree experience each day?

Step 3A - PRACTICE (Math and Learning Centers)

Challenge

Why can't we grow our own chocolate?

Students compare the environmental conditions in their local region to the conditions in which cacao trees grow naturally. Students create charts and maps to organize their findings and highlight the environmental differences between temperate forests and tropical rainforests.

Materials

- Large chart paper
- Magic markers

Procedure

1. Teachers create a large chart for the front of the classroom that will include the aspects of different biomes. A biome is a group of ecosystems that have similar climate and plant species. Select two or three examples of different biomes to be filled in as examples for students. These might include arctic areas, desert, temperate zones and tropic zones.

The chart should include:

- a. Climate
- b. Plant life
- c. Animal life
- d. Space for student observations

2. Discuss the differences in biomes around the world and how those biomes provide just the right conditions for certain kinds of plants and animals to survive. The chart should give an overview of the earth's biomes.
3. Create a chart that can be filled in by students that describes their biome and more specifically, their bioregion. A bioregion is an area whose limits are naturally defined by features such as mountain ranges or ecosystems. This chart will be filled in by individual students and edited in small groups to further describe the place where they live. Chart should include: climate, plant life, animal life and student observations.
4. Using the description from **Romel's Rainforest Home**, fill in a chart that contains what you know about the rainforest.

Step 3B - CREATE (Performance Tasks Related to Standard Indicators)

Challenge

Students will compare and contrast the growing conditions of a temperate tree and the cacao tree.

Materials

- Art supplies (construction paper, glue, markers, etc.)

Procedure

1. Half of the students in the classroom should create 3D models of cacao trees, including chocolate pods, the surrounding forest and evidence of human and other animal activity. Labels of the growing conditions (climate, rain amounts, sun, pollinators, etc.) should be placed around the tree.
2. The other half of the classroom should create a 3D model of a local tree including the seed pods, surrounding plant life, evidence of animal and human activity as well as the growing conditions.

Step 4 - PRESENT (Edit Work/Students Orally Present Projects)

Challenge

Students present their models to their peers, explaining how their tree depends on the conditions created by the tropical rainforest or temperate forest biome. After, students combine their models to create a larger tropical rainforest or temperate forest.

Materials

- 3D cacao tree models from Step 3B

Procedure

1. Students will display their models and write a short description of the differences among the temperate and tropical trees. This should include an observation about why each of the trees might thrive or fail in the other biome.

LESSON 2 ASSESSMENT RESULTS:

Teacher observations of tasks with rubrics as listed below, as well as collected work samples.

Assessment Guidelines	3 = P (Proficient)	2 = S (Satisfactory)	1 = NW (Needs Work)
1. Student understands the origin of ingredients, production sites, different sources of transportation, store sites, packaging and raw materials, and can develop a concept map to represent these paths.			
2. Student shifts perspectives and writes a fictional/nonfiction story of the chocolate bar production including all aspects from the concept map.			
3. Student researches and identifies all aspects necessary for the healthy production of cocoa beans and compiles these in a research paper.			
4. Student researches and charts the rainfall and temperature of rainforest conditions in Ecuador.			
5. Student works well with a team and creates a biome map of their local region and compare it to the Ecuadorian rainforest.			
6. Student creates a 3D model that is labeled with the necessary growing conditions for cocoa, including aspects of soil, temperature, rainfall, pollination, ripening schedule and sunlight.			
7. Student effectively explains his/her model to peers.			