NATIONAL GEOGRAPHIC

RESOURCE LIBRARY
ACTIVITY : 2 HRS 30 MINS

Taking a Position on Human Activity in the Amazon Rainforest

Students learn about three scenarios that involve heavy construction in the Amazon rainforest. They read case scenarios that describe what proponents and critics say about each scenario. Students use the MapMaker Interactive to pinpoint the locations of the construction projects and conduct research to develop a position statement on whether or not construction should occur.

GRADES

6 - 8

SUBJECTS

Biology, Geography, Human Geography

CONTENTS

1 Link, 6 PDFs, 3 Images

OVERVIEW

Students learn about three scenarios that involve heavy construction in the Amazon rainforest. They read case scenarios that describe what proponents and critics say about each scenario. Students use the MapMaker Interactive to pinpoint the locations of the construction projects and conduct research to develop a position statement on whether or not construction should occur.

For the complete activity with media resources, visit:
http://www.nationalgeographic.org/activity/taking-position-human-activity-amazon-rain-forest/

DIRECTIONS

1. Activate students' prior knowledge about the positive and negative effects of construction.

Activate students' prior knowledge about human impacts on the environment. Prompt students to think about various construction projects, such as buildings, bridges, and highways. If possible, elicit local examples to illustrate the fact that construction is also happening locally and not just in distant countries. Have students discuss why these construction projects are important for local communities and people who live there. Ask: *Why do we need more bridges? Another building? Wider highways? What are the benefits of making these changes?* Then have students think about the effects these projects have on the environment. Ask: *What other living things are often affected by decisions to build bridges, roads, or buildings? How are they affected?* Have students discuss both the positive and negative effects of construction.

2. Explore the geography and wildlife of the Amazon Basin.

Following the discussion, have students think about the potential effects of construction projects in areas of the world that have been untouched by human development. Tell students they will use the MapMaker Interactive to explore the geography and wildlife of the Amazon Basin. Introduce students to the MapMaker Interactive by describing it as an interactive Geographic Information Systems (GIS) mapping tool. Explain to students that the MapMaker Interactive supplies base maps and map layers, along with tools to help them view and customize maps to explore questions they are interested in investigating.

Distribute the worksheet Exploring the Amazon Rain Forest to each student. Have students work through Part 1. General Information about the Amazon Basin independently or in partners as they familiarize themselves with the MapMaker Interactive interface.

3. Introduce students to three potential construction projects in the Amazon Basin.

Regroup and facilitate a whole-class discussion around question 4 on the worksheet: *What did you notice about land cover in the area around the Amazon River?* Ask students to share their observations and their conjectures about why they think it looks this way. Then introduce photographs of the three different scenarios: the Belo Monte Dam, the Pucallpa-Cruzeiro do Sul Road, and the S11D Mine. Explain that these three projects will cut through areas of the Amazon rain forest. Explain to students that they will conduct research on the different

scenarios and write a position statement on whether or not each of these projects should occur. Before students begin their research, ask them to predict what consequences, both good and bad, they would anticipate from these scenarios.

4. Extend students' understanding of scenarios through MapMaker Interactive and online research.

Divide students into small groups. Distribute the handout To Build or Not Build? Three Construction Scenarios in the Amazon Basin to each student. Have each group read their assigned scenario with a focus on the impacts of construction. Check for understanding by asking groups the following questions: *Who is this project going to help? How is it going to help them? Who will this project harm? In what ways will this project affect the Amazonian ecosystem?* Explain that each group will research the advantages and disadvantages of their assigned scenario. Ask students to complete Part 2. Scenario Research on the worksheet using the Three Construction Projects in the Amazon geo-tour in the MapMaker Interactive. For more in-depth research, have students use the websites provided in each one of the markers in Three Construction Projects in the Amazon. Ask students to complete worksheet Part 3. Preparing to Present Findings as they conduct research, in preparation for sharing their findings with the class.

5. Have each group present its findings to the class.

Have each group take turns presenting their research findings to the class. Ask students to work independently to take notes on the advantages and disadvantages of each project as other groups present. Then discuss the findings as a whole class. Ask: *For those of you that had the same scenario, did you find similar things? Were there common or different stakeholders across projects? Were both advantages and disadvantages for each project addressed? How would stakeholder concerns be addressed? Could different actions be taken to minimize the environmental impact on the surrounding area? What other research should be conducted before a final decision is reached?*

6. Develop a position statement for or against construction in the Amazon basin.

Distribute the Position Statement Rubric and review it with students. Use the Sample Position Statement handout about skateboards on sidewalks as an example to illustrate the components of a position statement and how it would be scored based on the rubric. Distribute the worksheet Writing a Position Statement about Construction in the Amazon Basin. Have students work independently to craft a position statement for or against one of the construction projects in the Amazon Basin. Ask students to refer back to the notes they took during the presentations and the information collected in their worksheets to craft their position statement.

Tip

Consider developing a graphic organizer to help students organize their online research.

Modification

For struggling readers, have them annotate the reading by circling new vocabulary and underlining important phrases or sentences. They can also be paired with more confident readers to help process the text.

Modification

Group struggling or reluctant readers with advanced students who tend to complete assignments quickly.

Modification

Group students who are less comfortable with technology with tech-savvy students.

Tip

More than one group will have the same scenario. Have groups with the same scenario present one after the other and then have them compare their findings.

Tip

Research a construction project in your local area to help students make a local connection to construction issues.

Tip

Scenarios include terms that may be new or less familiar to students. Check for understanding after students have read their assigned scenarios. Refer to the vocabulary list and related encyclopedic entries to develop students' background knowledge.

Tip

Three, 50-minute class periods are suggested for this activity as follows: Day 1—introduce the project and have students start research using the MapMaker Interactive; Day 2—students complete online research, discuss, and formulate their arguments; Day 3—students present their arguments and wrap up the project.

Modification

To ensure that everyone participates in group work, assign or allow students to choose roles according to their strengths (e.g., recorder, facilitator, speaker, computer driver).

Alternative Assessment

Score students' final position statements using the provided rubric. This rubric includes evaluative criteria for the position and supporting arguments.

Extending the Learning

- Create a closed classroom website or discussion board for students to share questions, ideas, or concerns as they conduct their research.
- Create relevant Twitter hashtags (e.g., #BeloMonte, #S11D, #PucRoad) for the different scenarios and have students tweet interesting facts, questions, or concerns they come across as they conduct their research. Advise students to not include any identifying information in their tweets.
- Hold a debate during which students can argue different positions.
- Consider making IBAMA, the Brazilian Institute of Environment and Renewable Natural Resources, the audience for the position statements to make the assignment more authentic. IBAMA is the Brazilian environmental agency that must provide an environmental license for developmental projects in the country. Position statements can become recommendations for whether or not IBAMA should issue licenses to each of the construction projects.

OBJECTIVES

Subjects & Disciplines

Biology

Geography

- Human Geography

Learning Objectives

Students will:

- explore the geography of the Amazon Basin using an interactive map
- use media and text to identify evidence that supports their position to build or not build a road, dam, or mine in the Amazon rain forest
- construct a position statement about whether or not to build a road, dam, or mine in the Amazon rain forest that includes their stance on the issue and supporting arguments that include credible, researchable facts
- identify various economic, cultural, and environmental factors that may influence their position

Teaching Approach

- Learning-for-use

Teaching Methods

- Cooperative learning
- Discovery learning
- Discussions
- Reading
- Writing

Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
  - Information, Media, and Technology Skills
    - Information Literacy
    - Media Literacy
  - Learning and Innovation Skills
    - Communication and Collaboration
    - Critical Thinking and Problem Solving
- 21st Century Themes
  - Environmental Literacy
- Critical Thinking Skills
  - Analyzing
  - Understanding
- Geographic Skills
  - Acquiring Geographic Information
  - Analyzing Geographic Information
- Science and Engineering Practices
  - Analyzing and interpreting data
  - Asking questions (for science) and defining problems (for engineering)
  - Engaging in argument from evidence
  - Obtaining, evaluating, and communicating information

National Standards, Principles, and Practices

ENERGY LITERACY ESSENTIAL PRINCIPLES AND FUNDAMENTAL CONCEPTS

• **Fundamental Concept 5.6:**
Energy decisions are influenced by environmental factors.
• **Fundamental Concept 7.3:**
Environmental quality is impacted by energy choices.

IRA/NCTE STANDARDS FOR THE ENGLISH LANGUAGE ARTS

• **Standard 7:**

Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.

NATIONAL GEOGRAPHY STANDARDS

- **Standard 1:**
How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information
- **Standard 14:**
How human actions modify the physical environment

COMMON CORE STATE STANDARDS FOR ENGLISH LANGUAGE ARTS & LITERACY

- **CCSS.ELA-LITERACY.SL.6.2:**
Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.
- **Speaking and Listening Standards 6-12:**
Comprehension and Collaboration, SL.8.3
- **Speaking and Listening Standards 6-12:**
Comprehension and Collaboration, SL.7.3
- **Speaking and Listening Standards 6-12:**
Presentation of Knowledge and Ideas, SL.7.4
- **Speaking and Listening Standards 6-12:**
Comprehension and Collaboration, SL.8.1.
- **Speaking and Listening Standards 6-12:**
Comprehension and Collaboration, SL.8.2
- **Speaking and Listening Standards 6-12:**
Presentation of Knowledge and Ideas, SL.8.4
- **Speaking and Listening Standards 6-12:**
Comprehension and Collaboration, SL.6.1
- **Speaking and Listening Standards 6-12:**
Comprehension and Collaboration, SL.6.3
- **Speaking and Listening Standards 6-12:**
Presentation of Knowledge and Ideas, SL.6.4
- **Speaking and Listening Standards 6-12:**

Comprehension and Collaboration, SL.7.1

• **Speaking and Listening Standards 6-12:**

Comprehension and Collaboration, SL.7.2

• **Writing Standards 6-12:**

Text Types and Purposes, W.7.2

• **Writing Standards 6-12:**

Text Types and Purposes, W.8.2

• **Writing Standards 6-12:**

Text Types and Purposes, W.6.1

ISTE STANDARDS FOR STUDENTS (ISTE STANDARDS*S)

• **Standard 4:**

Critical Thinking, Problem Solving, and Decision Making

NEXT GENERATION SCIENCE STANDARDS

• **MS-ESS3: Earth and Human Activity:**

 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Blank paper
- Pencils

REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per small group, Presentation software

PHYSICAL SPACE

- Classroom
- Computer lab

- Media Center/Library

GROUPING

- Heterogeneous grouping
- Large-group instruction

OTHER NOTES

Three, 50-minute class periods are suggested for this activity as follows: Day 1—students work through Part 1 of the handout as they familiarize themselves with the MapMaker Interactive and the Amazon Basin; Day 2—students conduct research on their assigned scenario through the MapMaker Interactive and online resources; Day 3—students present their research findings and construct their individual position statements.

BACKGROUND & VOCABULARY

Background Information

The Amazon is the largest tropical rain forest in the world. It is globally important for its biodiversity as well as its role in climate change. Found within the rain forest are plants and animals that have helped make advances in medicine. And the abundance of large canopy trees helps the rain forest act as a carbon sink, allowing it to remove carbon dioxide from the atmosphere. With rapid deforestation, it has been estimated that 20% of the Amazon rain forest has disappeared in the last 50 years, which has already led to detrimental effects to biodiversity and the increase of climate change. Between 2005 and 2010, Brazil made efforts to protect the rain forest and promote sustainable development. During this time, greenhouse gases in Brazil decreased by 39%, faster than any other country. Recently, this trend has reversed as deforestation increases due to illegal logging, ranching, dam and mine construction, and ambiguity about who is entitled to the land.

There are many species of plants and animals that live in the Amazon rain forest that are endangered or threatened, including primates such as the spider monkey and red-handed howler monkey. When large trees are removed, the canopy that provided shelter, food, or nesting for some of these species disappears, resulting in relocation and possible

fragmentation of some populations. Changes made to the ecosystem affect all life that lives there, but for the endangered or threatened populations, these changes could challenge their survival.

Indigenous communities are scattered throughout the Amazon rain forest. These populations have a long relationship with the rain forest that allows them to hunt, fish, and grow crops for sustenance. Indigenous territories have been diminishing as loggers, drug traffickers, oil companies, and miners have encroached on their lands. As a result, these communities have retreated deeper into the jungle, where they choose to live in isolation to preserve their cultural traditions and spiritual connections to the rain forest. Some indigenous people relevant to this activity are the Ashéninka at the border of Peru and Brazil for the Pucallpa-Cruzeiro do Sul road scenario and the Juruna who will be affected by the Belo Monte dam.

Prior Knowledge

["some knowledge of the complexity of the Amazonian ecosystem, including the biodiversity of flora and fauna","familiarity with the MapMaker Interactive"]

Recommended Prior Activities

- Protecting Biodiversity in the Amazon Rainforest

Vocabulary

Term	Part of Speech	Definition
biodiversity	*noun*	all the different kinds of living organisms within a given area.
climate	*noun*	all weather conditions for a given location over a period of time.
deforestation	*noun*	destruction or removal of forests and their undergrowth.
ecosystem	*noun*	community and interactions of living and nonliving things in an area.
indigenous	*adjective*	characteristic to or of a specific place.
logging	*noun*	industry engaged in cutting down trees and moving the wood to sawmills.
mining	*noun*	process of extracting ore from the Earth.
rainforest	*noun*	area of tall, mostly evergreen trees and a high amount of rainfall.

For Further Exploration

Maps

- The Embattled Amazon

Reference

- South America: Physical Geography

Websites

- The New York Times: Amid Brazil's Rush to Develop, Workers Resist
- BBC News: Work to Resume on Brazil's Belo Monte Dam
- The Guardian: Belo Monte, Brazil: The tribes living in the shadow of a megadam
- Worldwatch Institute: Conservationists Fight Proposed Amazon Road
- National Geographic Education: MapMaker Interactive
- The Washington Post: Another Huge and Open Iron Mine is Carved out of Brazil's Rain Forest
- ICAA – The Initiative for the Conservation of the Andean Amazon and the World Wildlife Foundation: Purus-Manu Conservation Corridor

FUNDER

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