My NASA Data - Lesson Plans

GLOBE Regional Connections: Earth Systems at a Regional Level, Defining Regional Boundaries

Grade Band

• 6-8

Time

• 90 minutes

Overview

Students discuss their current understanding of what Earth systems are and how they work and consider how to identify the boundaries of a region for Earth system study. In small groups, they select a region for recommendation to the class, and they make a list of characteristics and features that can mark the boundaries of regional systems. After presentations by each group, the class chooses one region for study as an Earth system. Then they mark the boundaries of their chosen region on their Landsat image, topographic map, or other maps.

Materials Required

- Landsat image of your school
- Topographic maps and/or others such as vegetation, physical, soil maps of the region covered by the Landsat image (as available)

Preparation

- Review the Landsat image and maps.
- Make student copies:
 - · Worksheets:
 - Identifying a Region for Study
 - Student Self-reflection Log: Identifying a Region
 - Assessment rubric for this activity (You may want to share with students.)

Procedure

Regional Connections: Earth Systems at a Regional Level

RC1: Defining Regional Boundaries



Introduction

Protocols

Learning Activities

Purpose

To identify a region for study as a system, and to establish a list of characteristics and features useful for determining the boundaries of regional systems

Overview

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Student Outcomes

Students will be able to.

- define "region" as an area which has similar features throughout;
- identify a specific region for study as an Earth system by finding boundaries; and
- describe the region's boundaries so that others can find them on a map.

Science Concepts

Earth and Space Sciences

Weather changes from day to day and over the seasons.

The sun is the major source of energy at Earth's surface.

Solar insolation drives atmospheric and ocean circulation

Each element moves among different reservoirs (biosphere, lithosphere, atmosphere, hydrosphere).

Physical Sciences

Heat is transferred by conduction, convection and radiation.

Heat moves from warmer to colder objects.

Sun is a major source of energy for changes on the Earth's surface. Energy is conserved.

Chemical reactions take place in every part of the environment.

Life Sciences

Organisms can only survive in environments where their needs are met.

Earth has many different environments that support different combinations of organisms

Organisms' functions relate to their environment.

Organisms change the environment in which they live.

Humans can change natural environments.

Plants and animals have life cycles.

Ecosystems demonstrate the

complementary nature of structure and function.

All organisms must be able to obtain

and use resources while living in a constantly changing environment.

All populations living together and the

All populations living together and the physical factors with which they interact constitute an ecosystem.

Populations of organisms can be categorized by the function they serve in the ecosystem.

Sunlight is the major source of energy for ecosystems.

The number of animals, plants and microorganisms an ecosystem can support depends on the available resources.

Atoms and molecules cycle among the living and non-living components of the ecosystem.

Scientific Inquiry Abilities

Analyzing maps

Collaborating with classmates

Communicate results and explanations.

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RC1: Defining Regional Boundaries Learning Activity - 1

Earth System Science

NGSS Three Dimensional Learning

NGSS Disciplinary Core Ideas

ESS1C: The History of Planet Earth

NGSS Crosscutting Concepts

Systems and System Models

NGSS Science and Engineering Practices

- · Asking Questions and Defining Problems
- Planning and Carrying out Investigations
- Constructing Explanations and Designing Solutions

• Obtaining, Evaluating and Communicating Information

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Teacher Background Information

General "Earth As a System" Documents

- Earth as a System Introduction (pdf)
- Earth as a System Appendix (pdf)

Teacher Resources

RC1Defining Regional Boundaries.pdf