Ribbons of Life--Rivers

Adapted from: FOSS, Lawrence Hall of Science

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Grade Level	1-2
Duration	3 class periods

National Standards	AZ Standards	Arizona Social Science Standards
GEOGRAPHY **Element 1: The World in Spatial Terms** 1. How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information. **Element 3: Physical Systems** 7. The physical processes that shape the patterns of the Earth's surface. **Element 6: The Uses of Geography** 18. How to apply geography to interpret the present and plan for the future.	**SCIENCE** **Earth and Space Standards** 1.E1U1.5 Obtain, evaluate, and communicate information about the properties of Earth materials and investigate how humans use natural resources in everyday life. 2.E1U1.4 Observe and investigate how wind and water change the shape of the land resulting in a variety of landforms.	**GEOGRAPHY** **The use of geographic representations and tools helps individuals understand their world.** 1.G1.1 Use, explore and construct maps, graphs and other geographical representations to support content focus. Key concepts include but are not limited to physical features (rivers, lakes, mountains, landforms, desert) and human features (dams, cities, parks, hospitals, schools, railroad tracks, farms, factories, houses). **The use of geographic representations and tools help individuals understand their world.** 2.G1.1 Use and construct maps, graphs, and other geographic representations of familiar and unfamiliar places in the world; and locate physical and human features. Key physical features include but are not limited to seven continents, oceans, lakes, rivers, mountain ranges, coasts, seas, and deserts. Key human features include but are not limited to equator, hemispheres, North and South Pole, cities, states, countries, regions, and landmarks

Overview

Throughout history the relocation and settlement of people have relied on water for transportaion, farming, and for life. Therefore, it is important for everybody to understand and appreciate how rivers form and the geographic terms associated with water systems.

Purpose

In this lesson, students will create a model of a river system and learn different geographic vocabulary associated with such systems. They will then map the model they created. They will learn the effect water flow has on the earth's surface.

Materials

- For each group of five students
  - 1 tray, plastic, with hole at one end
  - 1 tub to collect drained water
  - 1:2 mixture of diatomaceous earth to fine-grain sand
  - 1 liter of water in a container
  - 1 ruler
  - Duct tape
  - Models of some actual objects (toy car, etc.)
  - Newspaper
  - Paper towels for cleanup
- Physical Landforms 1st Grade map http://geoalliance.asu.edu/sites/default/files/maps/Physical_1st_PO4_Colors.pdf

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- Physical Landforms 2nd Grade map http://geoalliance.asu.edu/sites/default/files/maps/Physical_2nd_PO5_Colors.pdf
- Optional Physical Landforms 3rd Grade map http://geoalliance.asu.edu/sites/default/files/maps/Physical_3rd_PO6_Colors.pdf
- Drawing paper

Objectives

The student will be able to:

1. Explain the effects of water flow on earth materials.
2. Draw an accurate map of a river system.
3. Identify physical features on a model and on a map.

Procedures

Prerequisite Skills: Students should have had experience with the types of landforms associated with river systems.

This lesson will highlight the following landforms: island, river, mountain, mountain range, plain, valley, plateau, lake, and perhaps peninsula. It is not effective for ocean, continent, volcano, or coastal features.

1. Project the Physical Landforms 1st Grade map and review the names and descriptions of a continent, mountain, river, lake, island, and ocean. http://geoalliance.asu.edu/sites/default/files/maps/Physical_1st_PO4_Colors.pdf (Optional: learn the terms found on the 2nd and 3rd grade Physical Landforms maps (mountain range, coast, desert, sea, plain, peninsula, valley, volcano, bay, strait, and gulf). http://geoalliance.asu.edu/sites/default/files/maps/Physical_2nd_PO5_Colors.pdf http://geoalliance.asu.edu/sites/default/files/maps/Physical_3rd_PO6_Colors.pdf
2. Place the landforms that you wish them to identify on a word wall or the white board. Accentuate the words with drawings.
3. Then introduce the term "model." A model is smaller than the real item. Show some models of cars, people, animals, etc.
4. Tell the students that they are going to make a model of a river system. Show the students the mixture of diatomaceous earth and sand that has been moistened with some water to make it easier to shape. Call it "earth material."
5. Divide students into groups of 5. Each group member will have a role: a getter, a recorder, a water person, a spreader, and a cleaner.
6. Model the procedures and have the groups follow along:
   a) The getter will gather the materials needed from the teacher or from a section of the room.
   b) The cleaner will put newspaper under the tray and the tub on the floor under the hole in the tray to catch any spills.
   c) The spreader will spread the earth material and form a plateau at the end of the tray opposite the hole. It should look like a vertical cliff.
7. *This stage may need the help of a classroom volunteer or the teacher.* Use the ruler to prop up the tray with the earth material. (Use the duct tape to fasten the ruler about 2 inches from the top of the tray so the tray drains towards the hole at the other end). Balance the container so the hole is over the water collecting container.
8. Have all 5 group members put toys/objects into the earth material.
9. The water person will pour some of the water slowly into the container. Students should observe and say what landforms occur and the recorder writes down the landforms mentioned. The recorder shares the list of landforms with the others in the group.
10. The water person will then pour water rapidly into the container. Repeat the process from step 8 above.
11. The getter will get sheets of drawing paper for each member of the group. Each member of the group will map the landforms they created in their group's tub and label them.
12. One at a time, the students in a group will lay down his/her map next to the group's model. The group will "check" the maps for accuracy.
13. The groups will then "tour" the other groups models. Conduct a whole class discussion about similarities and differences.

Assessment

Geography

Maps can be graded for accuracy in labeling the landforms created. Mastery will be considered 80% or higher.

Science

Have students write 1-2 sentences describing how water flow impacted the earth in their models. Have students write 1-2 sentences on how water moving more rapidly affected their model. Mastery will be considered writing 2 correct sentences based on the questions asked.

Extensions

Students can experiment with flooding by adding some legos or toys to the earth material and taking the tub outside to a garden hose.

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Sources

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