iScience
Readers

Landforms:
The Ever-changing Earth

by Emily Sohn and Adam Harter

Science Objective

In this book, children will learn about landforms and how the contours and elevations of the land change through erosion and deposition. Landforms also change due to water, earthquakes, volcanic activity, flooding, and severe weather conditions, as well as human activity. As children read this book, they will understand how and why the surface of the Earth is always changing. They will also learn how to read topographic and contour maps.

iScience Puzzle: Why Is This Rock Alone?

This hands-on activity helps children discover on a small scale how water affects landforms. By filling a box with soil, tilting it, and then repeatedly spraying the soil with water, children observe how the soil is carried off. They will apply this learning to discover how flowing water wears away landforms and deposits sediments that build up other landforms.

Objectives ➤ Children will:

- define landforms and provide examples.
- understand the effect of water on landforms.
- explain how erosion, weathering, and deposition change landforms.
- read contour maps to understand elevations and contours of landforms.

Materials

- felt-tipped pen
- four glasses
- gravel
- masking tape
- modeling clay
- sand
- potting soil
- water

Lesson Plan

Before Reading

Investigation	Science Concepts
Write the word *landform* on the board. Ask: *What is a landform?* Create a word web with *landform* in the center circle and examples (such as mountains, hills, valleys, lakes, rivers, volcanoes, canyons, and sand dunes) in the outer circles. Have children add to this web as they read this book. Ask: *Which landforms are found in our community?*	All landforms are the result of processes that change or create the surface of Earth over time.
Ask: *Do you think that hills and mountains stay the same height or do they change over time?* Return to this discussion as children gain more knowledge.	Landforms are the result of a combination of such forces as erosion, which wears away Earth's surface; and deposition of sediments, which builds up the landforms.

Tell children that they will learn how and why the surface of Earth is always changing. They will understand the processes that change landforms. As children learn to read topographic and contour maps, they will become familiar with different ways that people measure landforms.

During Reading

Investigation	Science Concepts
pp. 6–7: Provide the materials listed so that children can participate in this hands-on activity. Water will wash away the soil and deposit it at the bottom of the box.	The slope of the land over which water flows affects the processes of erosion and deposition.
pp. 8–9: Allow children to touch and examine soil, clay, and sand. Ask: *How are they alike? How are they different?* Have them compare and contrast them, recording their responses in three overlapping circles.	Water interacts differently with different earth materials.
p. 10: Relate this information to what happens on streets in the children's neighborhoods when it rains. Discuss why even an unpaved road that changes shape as puddles and shallow basins form can be considered a changing landform.	Human activities, such as road-building, can affect natural changes.
p. 12–15: On the board, begin a list or a cause-and-effect chart of the different processes that can change or create landforms, such as erosion, deposition, weathering, rain, snow, rivers, and ice.	Deposition and erosion increase during flooding and extremes of rain, heat, ice, and wind.

During Reading (continued)

Investigation	Science Concepts
p. 16: Ask children to describe what potholes are and how they are formed and repaired.	Water expands or contracts as heat is taken away or added.
pp. 18–21: Add earthquakes and volcanic activity to the list of processes that change landforms. Earthquakes can create mountains.	Earthquakes and volcanic eruptions change landforms very quickly and sometimes very drastically.
pp. 24–25: To help children determine the force of water, ask whether they have ever gone swimming in a river or at the ocean. Ask children who have to describe how the current or force of the waves pulled them.	The slope of the land over which water flows affects the processes of erosion and deposition. The rate of the flow of water also affects these processes.
p. 26: Ask: *Do you think that a landform made from deposits of sediment would be good for growing crops? Why or why not?* Explain that deltas are considered quite fertile.	Asking questions is fundamental to developing hypotheses, on which many scientific experiments and investigations are based.
p. 28: Have children research newspaper reports of flooding in their area or in other regions in the United States. Suggest that they work in pairs and then write or present brief facts about the flooding.	Research skills are tremendously important in science.
p. 35: Extend this activity by having children draw maps of the schoolyard. Tell them to divide paper into grids to help them correctly place buildings, trees, and other features.	Topographic maps represent three-dimensional surfaces through the use of lines, colors, and symbols.
p. 36: Compare and contrast contour and topographic maps. A contour map is used to show elevation; a topographic map shows features of the landscape and terrain.	Different types of maps are meant to be used for different purposes.
pp. 38–41: Continue the list of processes that change landforms by adding different kinds of human activity.	Human activity affects the processes of erosion and deposition.
p. 43: Have children summarize what they have learned as they explain how they completed the activity in the iScience Puzzle and demonstrated the power of water to erode and change the surface of Earth.	Flowing water causes both erosion and deposition, changing landforms.

After Reading

Restate the key ideas in the book. For example, the surface and landforms on Earth are always changing. Landforms are created by volcanoes, earthquakes, and deposition; they are changed through erosion, weathering, water, ice, and different types of human activity. Encourage children to explain what they learned.

Investigation	**Understanding Science**
Extend the iScience Puzzle by having children use different types of earth materials such as gravel, pebbles, or sand; increase the slope; change the amount of earth material; or change the rate or amount of water flow.	Earth's processes affect landforms in many different ways.
Encourage children to create a topographic map of a local park. Have them create a key that shows the meaning of the landforms.	Flat topographic maps represent three-dimensional landforms.
Provide aerial photographs of a region. Ask children to name the landforms they see as well as human-made features or activity. Challenge children to create contour maps from them.	Sometimes real maps are made from the information in aerial photographs.