



Earth's Surface Changes Lessons

Websites

Weathering

[Peakware World Relief Maps](http://www.peakware.com/encyclopedia/zoom.htm)

This site is home to 3-D interactive relief maps of continents, mountain ranges, and specific peaks.

(<http://www.peakware.com/encyclopedia/zoom.htm>)

[USGS: A Field Guide to Buildings in Our Nation's Capital](http://pubs.usgs.gov/gip/acidrain/fieldguide.html)

This site provides a tour of buildings in Washington, D.C. that show the effects of weathering.

(<http://pubs.usgs.gov/gip/acidrain/fieldguide.html>)

[National Park Service: Arches National Park](http://www.nps.gov/arch/index.htm)

The extraordinary features of the park, including balanced rocks, fins, and pinnacles, are highlighted by a striking environment of contrasting colors, landforms, and textures.

(<http://www.nps.gov/arch/index.htm>)

[World Art Treasures](http://www.bergerfoundation.ch/wat4/zoom_english.cgi?dia=18)

The frescoes of Sandro Boticelli can be used to discuss the effects of weathering on works of art. *Giovanna Paying Homage to Venus and the Graces* is the fresco displayed on this site.

(http://www.bergerfoundation.ch/wat4/zoom_english.cgi?dia=18)

[Sandro Boticelli: St. Augustine](http://www.artchive.com/artchive/B/botticelli/st_augustine.jpg.html)

The frescoes of Sandro Boticelli can be used to discuss the effects of weathering on works of art. *St. Augustine* is the fresco displayed on this site.

(http://www.artchive.com/artchive/B/botticelli/st_augustine.jpg.html)

[Sandro Boticelli: Giovanna degli Albizzi Receiving a Gift of Flowers from Venus](http://www.artchive.com/artchive/B/botticelli/albizzi.jpg.html)

The frescoes of Sandro Boticelli can be used to discuss the effects of weathering on works of art. *Giovanna degli Albizzi Receiving a Gift of Flowers from Venus* is the fresco displayed on this website.

(<http://www.artchive.com/artchive/B/botticelli/albizzi.jpg.html>)



[Andrew Wyeth](http://www.andrewwyeth.com/)

An online gallery of Andrew Wyeth's paintings, art prints, and posters, including many works depicting weathered buildings and structures.
(<http://www.andrewwyeth.com/>)

[Weathering of Rocks](http://www.innvista.com/science/earth/geology/weath.htm)

A list of terms about the effects that various types of chemical and physical weathering have on rocks.
(<http://www.innvista.com/science/earth/geology/weath.htm>)

[Virtual Field Trip to Bryce Canyon](http://www.nps.gov/brca/index.htm)

[Bryce Canyon National Park](http://www.nps.gov/brca/index.htm)

The official Bryce Canyon National Park web site has detailed information on Bryce Canyon's geology and natural history.
(<http://www.nps.gov/brca/index.htm>)

[Utah! The Geology and History of Bryce Canyon](http://www.utah.com/nationalparks/bryce.htm)

This site is a visual guide to the geology and history of Bryce Canyon. There is a beautiful photo tour of the park.
(<http://www.utah.com/nationalparks/bryce.htm>)

[Color Landform Atlas of the United States](http://fermi.jhuapl.edu/states/states.html)

Identify landforms in states and local areas through shaded relief maps and satellite image maps of each state.
(<http://fermi.jhuapl.edu/states/states.html>)



Earth's Surface Changes Lessons

Books

General

If you have a budget for purchasing books, the Science Companion development team especially recommends the following six titles to supplement the Earth's Changing Surface unit:

The Big Rock

By Bruce Hiscock. (1999, Aladdin Books)

This age-appropriate picture book tells the story of a rock and how it was shaped through time. It explains how the rock emerged from a volcano, ended up on the bottom of the ocean, was uplifted by a mountain, transported by a glacier, and finally weathered by wind and rain.

Earth (Eyewitness Books)

By Susanna Van Rose. (2005, DK Children)

An extraordinary visual guide to earth science and the forces that shape the earth, this book takes children on a visual journey of the earth's landscapes and highlights how the study of earth science has developed through the ages.

Erosion (A Carolrhoda Earth Watch Book)

By Cherie Winner. (1999, Carolrhoda Books, Inc.)

This book describes how water, glaciers, and wind shape our planet. Excellent photographs support age-appropriate text. A 2000 National Science Teachers Association Outstanding Trade Book for Children.

Our Planet Today (21st Century Science)

By Claude Lafleur. (2001, World Almanac Library)

This book is the perfect challenge for students who want to supplement their learning. The detailed computer-generated images use arrows, cut-aways, and enlargements to provide detailed explanations of the processes that shape the earth's surface. Other sections on map-making and the continents help teachers integrate social studies concepts with this unit.



Planet Earth (Visual Factfinder)

By Neil Curtis and Michael Allaby. (1993, Kingfisher Books)

Explores how the earth's landscapes are shaped through weathering, erosion, deposition, and forces such as mountain uplift and volcanoes. Includes hundreds of detailed color illustrations and photographs with interesting fact captions throughout. Although out of print, this book is well worth searching for in a local library.

Shaping the Earth

By Dorothy Hinshaw Patent; photography by William Munoz. (2000, Clarion Books)

This colorful and informative book shows how the earth's surface is shaped by shifting tectonic plates, mountain uplift, volcanoes, glaciers, rivers, and wind. It explains the role of living organisms in landscape formation and the profound influence of human beings on the landscapes of our planet. The text is splendidly illustrated with color photographs.

Picture Books and Read-Alouds

Earthsteps: A Rock's Journey through Time

By Diane Nelson Spickert; illustrated by Marianne D. Wallace. (2010, Fulcrum Publishing)

Take children on a rock's journey as the process of weathering transforms it from a large chunk of granite to a small grain of sand.

How Much Is a Million?

By David Schwartz; illustrated by Steven Kellogg. (1997, Perfection Learning)

This early-elementary book helps children conceptualize the immensity of numbers, such as a million, billion, and trillion, that come up when talking about how landforms change over long periods of time.

The Pebble in My Pocket: A History of Our Earth

By Meredith Hooper; illustrated by Chris Coady. (1997, Frances Lincoln Children's Books)

With poetically written text, this beautiful book follows the trail of a single pebble over millions of years. Some of the concepts will require explanation and discussion, making it a good book to read aloud.



Rocks in His Head

By Carol Otis Hurst; illustrated by James Stevenson. (2001, Greenwillow)

Ms. Hurst recounts the story of her father, a rock hound, who was dissuaded from making a career of his first love. Eventually, her father lands a job at the local science museum and goes on to become the curator of its mineral collection. An engaging and nostalgic tale told with great insight and affection. A 2002 National Science Teachers Association Outstanding Trade Book for Children.

Nonfiction Books

Digging Deeper: Investigations into Rocks, Shocks, Quakes, and Other Earthy Matters

By Sandra Markle. (1987, Lothrop, Lee & Shepard Books)

This book discusses various aspects of geology, such as plate tectonics, erosion, and minerals. It includes experiments and other activities.

Painters of the Caves

By Patricia Lauber. (1998, National Geographic Society)

This book describes the 1994 discovery, in Chauvet, France, of a cave with Stone Age rock paintings, and discusses the significance of cave art to people living in prehistoric as well as modern times.

Planet Earth (Time-Life Student Library)

By Karin Kinney. (1998, Time-Life Books)

This age-appropriate resource book contains content on a wide variety of topics, including volcanoes, weather, rivers, and earthquakes. It also highlights the effect that earth forces have on humans around the world. There are hundreds of excellent photos and illustrations.

Other Recommended Reference Books for Teachers

Earth Story: The Shaping of Our World

By Simon Lamb and David Sington. (2003, Princeton University Press)

This book is a companion to the BBC-Learning Channel series. Vivid images and illustrations show the earth's structure and how the surface of the earth is shaped by an interacting system of atmosphere, water, tectonic plates in motion, and living organisms. The authors express a passion for planet Earth and the diverse life it supports.



Geology Crafts for Kids: 50 Nifty Projects to Explore the Marvels of Planet Earth

By Alan Anderson, Gwen Diehn, and Terry Krautwurst. (1998, Sterling Publishing)

A fun collection of 50 activities and craft projects that teach children about geology topics such as minerals, crystals, volcanoes, erosion, and fossils. Includes great full-color illustrations and easy-to-follow directions.

How the Earth Works (How It Works)

By John Farndon. (1999, Dorling Kindersley Publishers)

This exploration of earth science topics is designed for adults and children and offers a hands-on approach to learning. It has detailed instructions on how to build models and carry out experiments, as well as suggestions for how to record experimental data and draw conclusions.

Janice VanCleave's Earth Science for Every Kid: 101 Easy Experiments that Really Work

By Janice Pratt VanCleave. (1991, John Wiley & Sons, Inc.)

This book has 101 easy experiments that cover topics such as rocks and minerals, crust movements, erosion, mountain building, weather, and the oceans. There are detailed step-by-step instructions and illustrations, as well as a scientific explanation of the results. The experiments are fun and use inexpensive, easy-to-find materials.

The Map that Changed the World: William Smith and the Birth of Modern Geology

By Simon Winchester (2009, Harper Perennial)

More than a biography, this is a compelling account of one quiet genius's struggle against the educated elites and scientific dogma that helped create a new field of science. The author provides rich detail about Smith's life and work, recreating the excitement that accompanies scientific discovery. A fascinating tale that weaves together the best features of history, science, and travelogue.

Origins: The Evolution of Continents, Oceans, and Life

By Ron Redfern. (2002, Weidenfeld Nicolson Illustrated)

This coffee table-style book has extraordinary panoramic photographs that reveal how the earth was formed and how it evolved through time. The text examines the dynamic processes that have shaped and continue to shape the earth's surface. The text is advanced, but the stunning images could be a useful resource and reference.



The Practical Geologist: The Introductory Guide to the Basics of Geology and to Collecting and Identifying Rocks

By Dougal Dixon. (1992, Fireside)

An informative text for teachers wishing to gain a core background in geology and geological processes. Good chapters on erosion and geomorphology. A useful teacher resource.

DVDs

Weathering and Erosion (Physical Geography)

TMW/Media Group, 2008

This film provides a sweeping overview of landscapes around the world that have been shaped by water, ice, wind, and storms. Beautiful footage and clear explanations make this an engrossing exploration of the earth's changing landscapes.