Effects of Weathering and Erosion 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 Our Geosphere 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.

Our Geosphere

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

Caves: One Small Square
By Donald Silver; illustrated by Patricia Wynne. (1997, McGraw–Hill)
Children explore a single square of a petroglyph that depicts cave life. A great introduction to caves and caving. A good resource for emergent readers.

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.

Maroo of the Winter Caves
By Ann Turnbull; illustrated by Ann Nicol. (2004, Sandpiper)
This fictional story depicts the life of Maroo, a young girl living during the last Ice Age, and the trials and tribulations she and her family endure.

Our Geosphere

Out of the Dust
By Karen Hesse. (1999, Scholastic)
This Newberry Award winning book describes the tragedy of the Dust Bowl as experienced through the eyes of 14-year old Billie Jo, an adolescent living in Oklahoma in the 1930's.

The River (Brian's Saga Series #2)
By Gary Paulsen. (1998, Delacorte Press)
This child-friendly sequel to Paulsen's Hatchet tells the fictional story of the boy Brian who returns to the woods to relive his epoch survival experience. When things go awry, Brian must build a raft and navigate a wild river to return to civilization. This adventurous tale will keep your advanced readers on the edge of their seats.

River Friendly, River Wild
By Jane Kurtz; illustrated by Neil Brennan. (2007, Aladdin)
This wonderful collection of poems for early-elementary readers describes how a girl and her family survived the disastrous 1997 Red River flood near Grand Forks, North Dakota.

A River Ran Wild
By Lynne Cherry. (2002, Sandpiper)
This beautifully illustrated book for early-elementary readers traces the ecological evolution of New England's Nashua River. Children learn how the river was respected by generations of Indians, polluted and deadened by the Industrial Revolution, and restored in recent years through the efforts of concerned citizens.

The Summer Sands
By Sherry Garland; illustrated by Robert Lee. (1995, Harcourt Press)
This wonderful storybook for early-elementary readers has beautiful illustrations that show how sand dunes form along the ocean coast. It tells a story about how people use trees to rebuild sand dunes destroyed by storms. Excellent for showing that humans can positively impact the delicate ecological balance of our planet.

Nonfiction Books

Our Geosphere

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.

Glaciers (True Books: Earth Science)
By Larry Dane Brimmer. (2000, Children's Book Press)
Beautiful photographs and concise text make this an excellent introduction to glaciers. The text is suitable for advanced readers only.

Glaciers (Worldlife Library)
By John Gordon. (2001, Colin Baxter Photography Ltd)
This excellent introduction to glaciers for advanced readers, with beautiful photographs throughout, vividly describes what glaciers are, how they form, and how they have shaped landscapes around the world.

Glaciers: Ice on the Move (A Carolrhoda Earth Watch Book)
By Sally M. Walker. (1990, Carolrhoda Books)
Describes the formation and movement of different types of glaciers, their effects on the land, and how scientists study glaciers. Nice text for independent readers and fantastic photographs.

Icebergs and Glaciers
By Seymour Simon. (1999, HarperCollins)
Discusses how glaciers form, where they are located, and how they move. Contains beautiful photographs of glaciers with easy to read, informative text.

Mountains (Geography Detective)
By Philip Sauvain; illustrated by David Hogg. (1996, Carolrhoda Books)
This age-appropriate book highlights the major features seen in mountains around the world and describes the processes that form and shape them.

Our Geosphere

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.

Rivers and Lakes (The Land Around Us)
By Mary Tull. (2004, National Geographic Society)
This comprehensive look at rivers and lakes focuses on geography and human interactions with these features. Bright photographs and easy-to-read text make this an excellent resource for emergent readers. Includes a glossary and a section about how to read bar graphs for information.

Sand Dunes (A Carolrhoda Earth Watch Book)
By Jan Gumprecht Bannan. (1989, Lerner Publishing Group)
Discusses dune areas in Oregon and elsewhere in the western hemisphere. Describes with detailed photographs the formation of sand and the forces which shape it into dunes. A good book for independent readers.

Other Recommended Reference Books for Teachers

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.

Our Geosphere

Glacial Geology: How Ice Shapes the Land
By Jon Erickson. (1996, Facts on File, Inc.)
Details the science of glacial geology. A good reference book for teachers who would like to learn more about the ice ages, causes and effects of glaciations, and glacial structures.

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.

Our Geosphere

DVDs

Desert (Eyewitness Series)
DK Children, 2010
This film has a great general overview of desert habitats and examines how deserts form, humans' relationship to them, and the types of creatures that live there. (35 minutes)

Natural Disasters (Eyewitness Series)
DK Children, 2007
This film explores the cataclysmic forces that shape our planet and affect our lives, from hurricanes to volcanoes. Rare footage reveals the earth at its most violent. (35 minutes)

Pond & River (Eyewitness Series)
DK Children, 2007
This video looks at the range of plants and animals found in fresh water, examining the living conditions and survival mechanisms of creatures dwelling at the edge of water, on its surface, or under the mud. (35 minutes)

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.

Our Geosphere

Effects of Weathering and Erosion Lessons

Websites

Rivers: The Force of Water

Artwork Depicting Rivers
View paintings by the Hudson River School artists.
(http://www.artcyclopedia.com/history/hudson-river-school.html)

Water Science for Schools
Learn about rivers, rainwater, stream flow, the water cycle, water erosion, and conservation.
(http://wwwga.usgs.gov/edu/mearth.html)

Geography Action 2001: Rivers
Information on how to take action to protect rivers, as well as lots of games, activities, and fact sheets about rivers.
(http://www.nationalgeographic.com/geographyaction/rivers/)

BBC Education: Rivers and Coasts
This site focuses on rivers and coasts. There is great information on how people affect rivers andcoastlines.
(http://www.bbc.co.uk/schools/landmarks/riversandcoasts/mainmenu.shtml)

NASA: Aerial Images of Rivers and Streams
This site has aerial and satellite photos that show how rivers, streams, floods, lakes, and wetlands shape the surface of the earth.
(http://visibleearth.nasa.gov/view_set.php?categoryID=671)

The Cave of Chauvet–Pont-d'Arc
Explore the Stone Age rock paintings and engravings discovered in a cave in Chauvet, France in 1994.
(http://www.culture.gouv.fr/culture/arcnat/chauvet/en/)

Our Geosphere

Sea Caves
This site explores sea caves, another type of cave formed by water.
(http://www.goodearthgraphics.com/virtcave/seacaves/seacaves.html)

USGS: Exploring Caves
There are lesson plans, lots of information about caves, and a great online kid's book on this site.
(http://egsc.usgs.gov/isb/pubs/teachers-packets/exploringcaves/)

Glaciers: The Force of Ice

NOVA and PBS: Anatomy of a Glacier
This site has a great overview of what glaciers are and how they shape the land, with excellent photos and easy-to-read text.
(http://www.pbs.org/wgbh/nova/everest/earth/glacier.html)

NOVA and PBS: Cracking the Ice Age
View articles about the greenhouse effect, how continents move, climate change, and how ice has shaped the earth's surface.
(http://www.pbs.org/wgbh/nova/ice/)

Solcomhouse: Glaciers and Ice Sheets
A simple overview of how glaciers shape the earth's surface, a collection of research articles, and a large photo collection. The Solcomhouse site is great science education resource.
(http://www.solcomhouse.com/icecap.htm)

NASA: Aerial Images of Glaciers
See aerial and satellite images of glaciers around the world.
(http://visibleearth.nasa.gov/view_set.php?categoryID=649)

Glaciers
This interactive website allows students to adjust mountain snowfall and temperature to see a glacier grow and shrink. Students use scientific tools to measure thickness, velocity and glacial budget.
(http://phet.colorado.edu/en/simulation/glaciers)

Fastest Glacier
This video segment adapted from NOVA scienceNOW features western Greenland's Jakobshavn Glacier, dubbed the world's fastest-flowing glacier. Scientists attempt to explain why this glacier is moving at a rate that far exceeds the average speed of glaciers and is contributing to a rise in global sea level.
(http://www.pbs.org/wgbh/nova/teachers/earth/fastest-glacier.html)

All About Glaciers
This website, sponsored by the National Snow and Ice Data Center, offers students and teachers background information about glaciers.
(http://nsidc.org/glaciers/)

Greenland's Receding Ice
Background information about Greenland's receding ice can be found on this website.
(http://svs.gsfc.nasa.gov/stories/greenland/)

Mountain of Ice : Life Cycle of a Glacier
Students can follow the journey of a single snowflake as it takes a ride through a glacier, a process that can take as much as 30,000 years to complete, on this interactive website.
(http://www.pbs.org/wgbh/nova/vinson/glacier.html)

Hoodoos and Sand Dunes: The Force of Wind

North American Drought — A Paleo Perspective
A comprehensive site on drought. This NOAA site looks at the big picture of climate change through time.
(http://www.ngdc.noaa.gov/paleo/drought/drght_home.html)

Cataclysmic Events

NOAA: The Kid's Natural Hazards Quiz
Explore thunderstorms, tornadoes, hurricanes, floods, winter storms, earthquakes, tsunamis, volcanoes, landslides, wildfires, and family disaster planning.
(http://www.ngdc.noaa.gov/hazard/kqStart.shtml)

U.S. National Weather Service and NOAA
This site provides national updates on floods, snow storms, and other weather hazards, including national warnings, local weather, world weather, and current issues. Includes U.S. weather maps.
(http://iwin.nws.noaa.gov/iwin/graphicsversion/bigmain.html)

The Hurricane Research Center
This comprehensive site on hurricanes has in-depth fact sheets and great photos. There are links to current hazards information.
(http://www.aoml.noaa.gov/hrd/weather_sub/faq.html)

A Moving Earth 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)
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Our Geosphere

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.

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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

How Mountains Are Made (Let's-Read-and-Find-Out Science 2)
By Kathleen Weidner Zoehfeld; illustrated by James Graham Hale. (1995, Collins)
This fun picture book for early-elementary readers follows the journey of four children as they hike from their school up into the mountains. They learn about mountain formation, fossils, and the earth's structure along the way.

Our Geosphere

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.

How to Dig a Hole to the Other Side of the World
By Faith McNulty; illustrated by Marc Simont. (1990, HarperCollins)
In this charming book, a boy offers step-by-step instructions on how to dig the deepest hole in the world. Readers will be amused by his uncanny imagination and rewarded with a wealth of information about the earth below our feet. The illustrator is a Caldecott Medal winner.

The Magic School Bus: Inside the Earth
By Joanna Cole; illustrated by Bruce Degen. (1989, Scholastic Inc.)
Miss Frizzle, her class, and their magic school bus journey into the center of the earth to study rocks and minerals. This book is packed with pictures and captions, and provides a simple introduction to the structure of the Earth. Also available in Spanish.

Pele and the Rivers of Fire
By Michael Nordenstrom. (2002, Bess Press)
This children's book tells of Pele, the goddess of fire. Filled with stunning artwork and stories of Polynesian folklore, students will be captivated as they learn the mythology behind the formation of the Hawaiian Islands.

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.

Earthquakes and Volcanoes: Reader's Digest Pathfinders
By Lin Sutherland. (2003, Readers Digest)

Our Geosphere

Exceptional images illustrate the science and history of volcanoes and earthquakes. Although the text is more appropriate for middle and high school aged children, this book is a great teacher reference for elementary classes.

Earth's Fiery Fury (Exploring Planet Earth)
By Sandra Downs. (2000, Millbrook Press)
Narration and photographs provide a comprehensive overview of volcanism and related geothermal activity. A unique feature is the descriptive vocabulary that helps the reader build a mental picture. A 2001 National Science Teachers Association Outstanding Trade Book for Children.

Mountains (Geography Detective)
By Philip Sauvain; illustrated by David Hogg. (1996, Carolrhoda Books)
This age-appropriate book highlights the major features seen in mountains around the world and describes the processes that form and shape them.

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.

Probing Volcanoes (Science on the Edge)
By Laurie Lindop. (2003, 21st Century Books)
This book provides a captivating perspective of the scientists who venture into volcanic craters to learn the secrets of volcanoes. It features lively accounts and follows researchers into the field, providing students with an excellent glimpse into the rewarding and exciting careers of geologists and geochemists. A 2004 National Science Teachers Association Outstanding Trade Book for Children.

Our Geosphere

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.

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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.

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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.

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

Our Geosphere

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.

DVDs

In the Shadow of Vesuvius: National Geographic
National Geographic, 2010
Mt. Vesuvius has been active for more than 17,000 years. In A.D. 79 an eruption ten times the size of Mt. St. Helen's destroyed the ancient cities of Pompeii and Herculaneum. The film observes archaeologists excavating Pompeii and explores the fascinating history of Vesuvius. (60 minutes)

Natural Disasters (Eyewitness Series)
DK Children, 2007
This film explores the cataclysmic forces that shape our planet and affect our lives, from hurricanes to volcanoes. Rare footage reveals the earth at its most violent. (35 minutes)

Volcano (Eyewitness Series)
DK Children, 2006
Mount Vesuvius is one of the volcanoes featured in this video offering excellent footage of volcanic eruptions and their aftermaths as well as related background information on volcanic structure and plate tectonics. (35 minutes)

A Moving Earth Lessons

Websites

Mountains and Volcanoes

Earth's Internal Layers: Crust, Mantle & Core
This site contains a useful video explaining Earth's internal layers.
(http://study.com/academy/lesson/composition-of-earths-internal-layers-crust-mantle-and-core.html)

Our Geosphere

Easy Science for Kids
This site explains in simple terms explains the Earth's layers along with some fun facts about the Earth's layers.
(http://easyscienceforkids.com/all-about-earths-layers/)

Mountain Formation
This brief video explains how the collision of two plates results in mountain ranges in New Zealand.
(http://www.bbc.co.uk/science/earth/surface_and_interior/mountain_formation#p00fzsnd)

The Process of Mountain Building
This site contains a useful video explaining the processes of mountain building.
(http://study.com/academy/lesson/the-processes-of-mountain-building.html)

The Seven Summits
My Himalayas
The Highest and Lowest Points on Earth
These are useful sites to reference if you are having your students complete the Mathematics Extension on Mount Everest in the Moving Plates Create Landscapes lesson.
(https://www.thoughtco.com/the-seven-summits-755900)
(http://www.myhimalayas.com/pictures/14peaks.htm)
(http://en.es-static.us/upl/2015/03/highest-lowest-points-Earth-e1427224368462.jpg)

Inside the Earth
These sites detail the structure of the earth, including its layers, and provide background information on plate tectonics.
(http://www.enchantedlearning.com/subjects/astronomy/planets/earth/Inside.shtml)

Earth Floors: Spheres
Learn all about the earth's structure and plate boundaries. The text is easy to read and there are great photos.
(http://www.cotf.edu/ete/modules/msese/earthsysflr/spheres.html)

Mountain Building Plate Tectonics Activity
This mountain building activity allows children to move tectonic plates in various directions and see how folded mountains form.
(http://www.pbs.org/wgbh/aso/tryit/tectonics/#)

This Dynamic Earth: The Story of Plate Tectonics
Learn about the earth's structure, plate tectonics, hotspots, and plate motions. View stunning images.
(http://pubs.usgs.gov/publications/text/dynamic.html)

When Continents Collide
See an animation of folded mountain formation.
(http://www.clearlight.com/~mhieb/WVFossils/collision.html)

Birth of the Himalaya
Explore photos and information on the geology, formation, and ecology of the Himalayas and Mount Everest. View an animation of the formation of the Himalayas.
(http://www.pbs.org/wgbh/nova/everest/earth/birth.html)

Images of Earth's Folded Crust (Folded Mountains) from Space
Space imagery, or mega geomorphology, provides an additional tool to reinforce that the compression of the earth's crust results in folded mountains.
(http://rst.gsfc.nasa.gov/Sect17/Sect17_3.html)

World Mountains Encyclopedia: Highest Peaks
Information on the highest mountain peaks in the world.
(http://www.peakware.com/encyclopedia/highest.htm)

Highest Peaks of the World
An additional site with information on the highest mountain peaks in the world.
(http://www.infoplease.com/ipa/A0001771.html)

Mountains on the Earth
A photo gallery of mountains found throughout the world.
(http://www.igf.fuw.edu.pl/hill/photo.html)

Mountains in North America: Appalachian Mountains
Includes detailed information and pictures about the Appalachian Mountains.
(http://www.igf.fuw.edu.pl/hill/nappal.html)

Mountain Arts and Crafts
This site introduces you to several of the crafts and craftspeople of the Blue Ridge Mountains.
(http://www.mtnlaurel.com/Crafts/crafts.htm)

Structure of a Composite Volcano
View diagrams of the parts of a volcano.
(http://www.enchantedlearning.com/subjects/volcano/)

Franklin Institute Science Museum: Earth Force
Learn about forces inside the earth that cause motion like volcanic eruptions and earthquakes.
(http://sln.fi.edu/earth/earth.html)

Volcano Animation
See an animation of several eruptive stages of a composite volcano (stratovolcano).
(http://www.pbs.org/wnet/savageearth/animations/volcanoes/index.html)

Photo Glossary of Volcanic Terms
Photographic glossaries of volcanic terminology.
(http://volcanoes.usgs.gov/images/pglossary/index.php)

Types of Volcanoes
Compare diagrams of fissure, dome, composite, ash-cinder, shield, and caldera volcanoes.
(http://library.thinkquest.org/C003124/en/fullvolcano.htm)

How Volcanoes Work
This website is an educational resource that describes the science behind volcanoes and volcanic processes. Scroll down the left side of the page for links to a wide variety of different volcanic topics, including volcanic landforms and products of eruptions.
(http://www.geology.sdsu.edu/how_volcanoes_work/)

The Eruptive History of Mount Vesuvius
This site provides a chronological history of the eruptions of Mount Vesuvius with associated artistic renderings and animations.
(http://vulcan.fis.uniroma3.it/vesuvio/79_eruption.html)

The Destruction of Pompeii
An informative web site outlining the events surrounding the eruption of Mt. Vesuvius.

Our Geosphere

(http://www.eyewitnesstohistory.com/pompeii.htm)

Volcanic Phenomena at Pompeii
This site provides Brief Chronology of Pompeii frozen in time by the 79 A.D. eruption of Mount Vesuvius.
(http://urban.arch.virginia.edu/struct/pompeii/volcanic.html)

Legends of Volcanoes
Read about the legends behind some of Earth's volcanoes.
(http://www.chevroncars.com/learn/wondrous-world/volcano-legends)

Mount St. Helens VolcanoCam
Take a virtual trip to Mount St. Helens.
(http://www.fs.fed.us/gpnf/volcanocams/msh/)

USGS: Cascades Volcano Observatory
This site has excellent information on Mount St. Helens, other volcanoes in the U.S., volcano hazards, monitoring, and much more. There are excellent maps, photos, and a detailed glossary.
(http://vulcan.wr.usgs.gov/home.html)

USGS: The Hawaiian Volcano Observatory
Explore the volcanoes of the Hawaiian Islands. This site is comprehensive and filled with great photos.
(http://hvo.wr.usgs.gov/howwork/)

Cataclysmic Events

NOAA: The Kid's Natural Hazards Quiz
Explore thunderstorms, tornadoes, hurricanes, floods, winter storms, earthquakes, tsunamis, volcanoes, landslides, wildfires, and family disaster planning.
(http://www.ngdc.noaa.gov/hazard/kqStart.shtml)

Kid's Earthquake Hazards Program – USGS
Explore a wide range of information on earthquakes, including a glossary with excellent photos and definitions of earthquake terms.
(http://earthquake.usgs.gov/4kids/)

Our Geosphere

"Earthquakes Learning Studio" — Exploratorium Museum
Explore earthquake myths and legends, seismology, and personal perspectives. There are lots of hands-on activities.
(http://www.exploratorium.edu/lc/pathfinders/earthquakes/)

Earthquake ABC book
View an alphabet book about earthquakes with words that children illustrated and defined. There is a guide for parents and teachers.
(http://earthquake.usgs.gov/learn/kids/abc/)

Understanding Earthquakes
Read about how earthquakes happen and learn about historic earthquakes. There are earthquake quizzes and fact sheets.
(http://www.crustal.ucsb.edu/understanding/)

Explaining Earth's Changes Lessons

Books

Noteworthy read-alouds

Earthsteps: A Rock's Journey Through Time
By Diane Nelson Spickert; illustrated by Marianne D. Wallace. (2010, Fulcrum Publications)
Take a walk back through time as a rock is transformed into a grain of sand over the course of millions of years. The succession of prehistoric life that serves as a backdrop for this transformation offers a wonderful sense of the vast time frame involved and will captivate children who are interested in dinosaurs.

Fossils Tell of Long Ago (Let's Read-and-Find-Out Science)
By Aliki. (1990, Collins)

Our Geosphere

With clear and simple explanations, this engaging book explains many of the ways that fossils are formed and what we learn by studying them. Appropriate for early readers. This book will help illustrate and explain the fossilization processes that are explored in the Fossils lessons cluster.

Stone Girl, Bone Girl: The Story of Mary Anning
By Laurence Anholt; illustrated by Sheila Moxley. (2006, Frances Lincoln Children's Books)
This delightful picture book with vibrant and colorful illustrations tells the story of a young girl in 18th century England who finds some of the first fossils of fish and marine reptiles. Kids will be amazed by the story of a girl who gets struck by lightning as an infant, survives, and as a child finds the fossil of one of the world's largest dinosaurs. A great addition to the Introduction to Fossils lesson.

Nonfiction books about rocks, minerals, crystals, and gemstones

The Best Book of Fossils, Rocks, and Minerals
By Chris Pellant; illustrated by Ray Grinaway and Chris Forsey. (2007, Kingfisher)
Large and detailed full-color spreads discuss and illustrate a variety of topics, including gems and metals, fossil fuels, and rocks from outer space. Written at an upper-elementary reading level.

Geology Crafts for Kids: 50 Nifty Projects to Explore the Marvels of Planet Earth
By Alan Anderson, Gwen Diehn, and Terry Krautwurst. (1998, Sterling Publications)
A fun collection of 50 activities and craft projects that teach children about geology topics such as minerals, crystals, volcanoes, erosion, fossils, and more. Includes great full-color illustrations and easy-to-follow directions.

Nonfiction books about fossils

Collecting Fossils: Hold Prehistory in the Palm of Your Hand
By Steve and Jane Parker. (1997, Sterling Publishing)

Our Geosphere

While the reading level of this book is beyond most second graders, the wealth of pictures and diagrams makes perusing this book worthwhile. The book also has an excellent section on how and where to look for fossils.

Fossil (Eyewitness Books)
By Paul Taylor. (2004, DK Children)
Each page contains many stunning photographs with short and clear captions. Readers at all levels enjoy leafing through the Eyewitness Books. Each book is like a mini-museum between the pages.

Fossils (The Bridgestone Science Library Exploring the Earth)
By Becky Olien. (2001, Capstone Press)
Explores the processes that shape the earth and changing geologic features, from plate tectonics to the rocks, soil, minerals, and fossils we find on the earth's surface. The text is easy-to-read and the photographs are rich and colorful.

Explaining Earth's Changes Lessons

Websites

Fossils
Provides information about fossils, as well as some short video clips on fossil hunting.
(http://www.neok12.com/Fossils.htm)

Fossils for Kids
This website is dedicated to providing fossil education, information and fun for kids of all ages. Questions will be answered, fossils will be found and you'll have fun in the process.
(http://www.fossilsforkids.com/)

Fossil Hunting Guide
The site from the Natural History Museum provides some great information on fossils.
(http://www.nhm.ac.uk/nature-online/earth/fossils/)

Our Geosphere

Kentucky Geological Survey- Fossil Resources
These pages from the University of Kentucky provide useful information on fossils and have links to lots of other useful sites.
(http://www.uky.edu/KGS/education/fosedu.htm)

What are Fossils?
Kids can learn about what fossils are, how they form, and their different types.
(http://www.kidsdinos.com/palaeontology-what-are-fossils.php)