Unit 2: Soils, Rocks, and Landforms Unit

Content Area: **Science**
Course(s): **Science**
Time Period: **Marking Period 2**
Length: **10 Weeks**
Status: **Published**

Unit Overview

Geology is the study of our planet's earth materials and natural resources. This module provides students with firsthand experiences using tools such as topographic maps and stream tables to study changes to rocks and landforms at the Earth's surface. This module has four investigations that focus on the concepts that weathering by water, ice, wind, living organisms, and gravity breaks rocks into smaller pieces, erosions transports earth materials to new locations, and deposition is the result of that transport process that builds new land.

Standards

Disciplinary Core Ideas (DCI's)

4-ESS2-1	Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.
4-ESS2-2	Analyze and interpret data from maps to describe patterns of Earth’s features.

Crosscutting Concepts (CC's)

CCC.1.1	students identify similarities and differences in order to sort and classify natural objects and designed products. They identify patterns related to time, including simple rates of change and cycles, and to use these patterns to make predictions.
CCC.2.1	students routinely identify and test causal relationships and use these relationships to explain change. They understand events that occur together with regularity might or might not signify a cause and effect relationship.
CCC.3.1	students recognize natural objects and observable phenomena exist from the very small to the immensely large. They use standard units to measure and describe physical quantities such as weight, time, temperature, and volume.
CCC.6.1	students learn different materials have different substructures, which can sometimes be observed; and substructures have shapes and parts that serve functions.
CCC.7.1	students measure change in terms of differences over time, and observe that change may occur at different rates. Students learn some systems appear stable, but over long periods of time they will eventually change.
SCI.3-5.4.2	A system can be described in terms of its components and their interactions.
SCI.3-5.6.2	Substructures have shapes and parts that serve functions.

SCI.3-5.7.2	Some systems appear stable, but over long periods of time will eventually change.

Science and Engineering Practices (SEP's)

SEP.1.c	Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.
SEP.2.a	Identify limitations of models.
SEP.2.d	Develop and/or use models to describe and/or predict phenomena.
SEP.2.f	Use a model to test cause and effect relationships or interactions concerning the functioning of a natural or designed system.
SEP.3.a	Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.
SEP.3.c	Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.
SEP.3.d	Make predictions about what would happen if a variable changes.
SEP.4.b	Analyze and interpret data to make sense of phenomena, using logical reasoning, mathematics, and/or computation.
SEP.4.c	Compare and contrast data collected by different groups in order to discuss similarities and differences in their findings.
SEP.5.b	Organize simple data sets to reveal patterns that suggest relationships.
SEP.6.a	Construct an explanation of observed relationships (e.g., the distribution of plants in the back yard).
SEP.6.b	Use evidence (e.g., measurements, observations, patterns) to construct or support an explanation or design a solution to a problem.
SEP.6.c	Identify the evidence that supports particular points in an explanation.
SEP.6.d	Apply scientific ideas to solve design problems.
SEP.7.a	Compare and refine arguments based on an evaluation of the evidence presented.
SEP.7.c	Respectfully provide and receive critiques from peers about a proposed procedure, explanation, or model by citing relevant evidence and posing specific questions.
SEP.7.d	Construct and/or support an argument with evidence, data, and/or a model.
SEP.7.e	Use data to evaluate claims about cause and effect.
SEP.8.a	Read and comprehend grade-appropriate complex texts and/or other reliable media to summarize and obtain scientific and technical ideas and describe how they are supported by evidence.
SEP.8.d	Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.
SEP.8.e	Communicate scientific and/or technical information orally and/or in written formats, including various forms of media as well as tables, diagrams, and charts.

Essential Questions

Investigation 1: Soils and Weathering

- What is soil?

- What causes big rocks to break down into smaller rocks?
- How are rocks affected by acid rain?
- What's in our schoolyard soils?

Investigation 2: Landforms

- How do weathered rock pieces move from one place to another?
- How does slope affect erosion and deposition?
- How do floods affect erosion and deposition?
- Where are erosions and deposition happening in our schoolyard?
- How do fossils get in rocks and what can they tell us about the past?

Investigation 3: Mapping Earth's Surface

- How can we represent the different elevations of landforms?
- How can we draw a profile of a mountain from a topographic map?
- How can scientists and engineers help reduce the impacts that events like volcanic eruptions might have on people?
- What events can change Earth's surface quickly?

Investigation 4: Natural Resources

- What are natural resources and what is important to know about them?
- How are natural resources used to make concrete?
- How do people use natural resources to make or build things?

Application of Knowledge: Students will know that...

- a profile can be drawn from information given on a topographic map.
- a profile is a side view or cross-section of a landform.
- a topographic map uses contour lines to show the shape and elevation of the land.
- alternative sources of energy include solar, wind, and geothermal energy.
- catastrophic events have the potential to change Earth's surface quickly.
- chemical weathering occurs when exposure to water and air changes rocks and minerals into something new.
- concrete is an important building material made from earth materials (limestone to make cement, sand, and gravel for aggregates, and water for mixing).
- deposition is the settling of sediments when the speed of moving water or wind declines.

- erosion is the transport (movement) of weathered rock material (sediments) by moving water or wind.
- natural resources are natural materials taken from the environment and used by humans. Rocks and minerals are natural resources important for shelter and transportation.
- scientists and engineers can do things to reduce the impacts of natural Earth processes on humans.
- scientists and engineers work together to improve how people use natural resources.
- soil can be described by their properties.
- soils are composed of different kinds and amounts of earth materials and humus.
- some natural resources are renewable (sunlight, air and wind, water, soil, plants, and animals) and some are nonrenewable (minerals and fossil fuels).
- the energy of moving water depends on the mass of water in motion and its velocity. The greater the mass and velocity, the greater the energy.
- the physical-weathering processes of abrasion and freezing break rocks and minerals into smaller pieces.
- the rate and volume of erosion relate directly to the energy of moving water or wind.
- the surface of Earth is constantly changing; sometimes those changes take a long time to occur and sometimes they happen rapidly.
- weathered rock material can be reshaped into new landforms by the slow processes of erosion and deposition.
- weathering is the breakdown of rocks and minerals at or near Earth's surface.

Application of Skills: Students will be able to...

- consider the ways people impact natural resources and how humans can conserve them.
- investigate the composition of soils from four different locations.
- make observations and interpret then to develop explanations in the way that scientists do.
- make predictions about stream-table investigations and compare results to the predictions.
- observe and compare local soils
- observe how earth materials are used in the community around the school.
- represent landforms in different ways to gather new information.
- use evidence from investigations to explain the effects of physical and chemical weathering.
- use stream tables to investigate how the slow processes of erosion and deposition alter landforms over time.

Assessments

Pre-Assessment/Survey

Investigation 1 -Soils and Weathering:

- Formative Assessments: Science Notebook entry, Response Sheet and Performance Assessment
- Benchmark Assessments: Survey, Investigation 1 I-Check

Investigation 2 - Landforms:

- Formative Assessments: Science Notebook entry and Response Sheet
- Benchmark Assessments: Investigation 2 I-Check

Investigation 3 - Mapping Earth's Surface:

- Formative Assessments: Science Notebook entries, Response Sheet and Performance Assessment
- Benchmark Assessments: Investigation 3 I-Check

Investigation 4 - Natural Resources:

- Formative Assessments: Response Sheet and Performance Assessment
- Benchmark Assessments: Posttest

Suggested Activities

Investigation 1

- **Part 1**: Soil Composition
    - Introduce earth materials
    - Collect soil samples and observe
    - Discuss materials that make up soils
    - Discuss "wet" observations, settle vials overnight, and then observe the settled vials
    - Science Resource Book: "What is Soil?"
- **Part 2**: Physical Weathering
    - Review soils
    - Discuss granite and conglomerate rocks
    - investigate how you can break these rocks into smaller pieces
    - Introduce physical weathering
    - Freezing investigation
- **Part 3**: Chemical Weathering
    - Introduce acid rain
    - Introduce four rocks and observe
    - Design and conduct acid-rain investigation
    - Introduce chemical weathering
    - Science Resource Book "Weathering"
    - View video on weathering

Investigation 2

- **Part 1**: Erosion and Deposition
    - Review soils and weathering
    - Set up stream tables and start investigation
    - Conduct the shake test
    - Observe the fish and place into their environments then add crustaceans
    - Introduce ecosystem and observe changes in the aquariums

    - Science Resource Book "Erosion and Deposition"
- **Part 2**: Stream-Table Investigations
    - Introduce variables to investigate
    - Plan the slope investigation
    - Plan the flood investigation
    - Summarize slope and flood results
    - View video, Erosion and Deposition
    - View online activities
- **Part 3**: Schoolyard Erosion and Deposition
    - Review erosion and deposition
    - Investigation- Where are erosion and deposition happening in our schoolyard?
    - View online activities: Stream Tables
- **Part 4**: Fossil Evidence
    - Introduce basin
    - View video about fossils
    - Demonstrate modeling fossil formation and make model fossils
    - Science Resource Book: "Fossils Tell a Story" and "Pieces of a Dinosaur Puzzle"

Investigation 3

- **Part 1**: Making a Topographic Map
    - Review stream-table maps
    - Discuss map limitations
    - Demonstrate how to build a model mountain
    - Introduce topographic map
    - Demonstrate the map making procedure
    - Science Resource Book: "Topographic maps"
- **Part 2**: Drawing a Profile
    - Introduce "profile"
    - Label the contour lines and demonstrate drawing a profile
    - Start drawing and then compare profiles and mountains
    - Science Resource Book: "The Story of Mount Shasta"
    - View video about volcanoes
- **Part 3**: Mount St. Helens Case Study
    - Introduce new topographic maps
    - View the USGS video of the eruption
- **Part 4**: Rapid Change
    - Discuss rapid and slow changes
    - Science Resource Book: "It Happened So Fast!"

Investigation 4

- **Part 1**: Introduction to Natural Resources
    - Build relationships among the concepts
    - Discuss why scientists study earth materials
    - View video about natural resources
    - Science Resource Book: "Monumental Rocks" and "Geoscientists at Work"
    - View online activity- "Resource ID"

- **Part 2**: Making Concrete
    - Relate earth materials to natural resources
    - Introduce concrete and the ingredients in concrete
    - Make concrete
    - Science Resource Book "Making Concrete"
- **Part 3**: Earth Materials in Use
    - Discuss the concrete stepping stone
    - Investigation- go on a walk outside to search for natural resources used as building materials
    - Science Resource Book "Earth Materials in Art" and "Where Do Rocks Come From?"

Activities to Differentiate Instruction

Differentiation for special education:

- General modifications may include:
    - Modifications & accommodations as listed in the student's IEP
    - Assign a peer to help keep student on task
    - Modified or reduced assignments
    - Reduce length of assignment for different mode of delivery
    - Increase one-to-one time
    - Working contract between you and student at risk
    - Prioritize tasks
    - Think in concrete terms and provide hands-on-tasks
    - Position student near helping peer or have quick access to teacher
    - Anticipate where needs will be
    - Break tests down in smaller increments

Differentiation for ELL's:

- General modifications may include:
    - Strategy groups
    - Teacher conferences
    - Graphic organizers
    - Modification plan
    - Collaboration with ELL Teacher
    - Model and encourage the use of new vocabulary
    - Project the equipment photo card for each objects and write the object's name on the word wall
    - Provide sentence frames for students who need them
    - Use Spanish provided resources if applicable
- Content specific vocabulary important for ELL students to understand include: abrasion, acid rain, basalt, calcite, chemical reaction, chemical weathering, clay, conglomerate, expand, freeze, granite, gravel, humus, limestone, marble, model, pebble, physical weathering, rock, sand, snadstone, silt, soil, weathering, basin, canyon, cast, delta, deposition, erosion, flood, floodplain, fossil, imprint, landform, mold, mountain, petrification, preserved remains, sediment, sedimentary rock, slope, valley, contour interval, contour line, crust, earthquake, elevation, landslide, lava, magma, mantle, profile, satellite cone, sea level, topographic map, volcano, cement, concrete, fossil fuel, geothermal power, natural

resource, nonrenewable resource, renewable resource, solar energy, wind power

Differentiation to extend learning for gifted students may include:

- Home/School Extension Activities
- Online Activities
- Cross Interdisciplinary Activities
-
    - Utilize the Math extension problems and Science extensions provided in Foss Teacher Manual
    - Contact the U.S. Geological Survey
    - Use the acid-rain test
    - Look for soil profiles
    - Take stream-table photos
    - Find out what surveyors do
    - Make "concrete" using plaster of paris

Integrated/Cross-Disciplinary Instruction

Technology: Environments Online Activities

Investigation 2, Part 2: Stream-Table Investigation

- "Videos: Stream Tables"
- "Tutorial- Stream tables: Slope and Flood"

Investigation 2, Part 3: Schoolyard Erosion and Deposition

- "Virtual Investigation- Stream Tables"

Investigation 3, Part 2: Drawing a Profile

- "Topographer"

Investigation 4, Part 1: Introduction to Natural Resources

- "Resource ID"

Investigation 1: (refer to pages 136-138 in Teacher's Manual)

- **ELA Extensions:**
    - Write soil stories
- **Math Extensions:**
    - Problem of the Week
- **Science Extensions:**
    - Contact the U.S. Geological Survey

- Invite a geologist or soil scientist to class
- Use the acid-rain test
- Look for soil profiles

Investigation 2: (refer to pages 194-196 in Teacher's Manual)

- **ELA Extensions:**
  - Write an investigation report
- **Math Extensions:**
  - Problem of the Week
- **Science and Engineering Extensions:**
  - Take stream-table photos
  - Plan a field trip
  - Find a local erosion-control expert
  - Go on a 15-minute field trip

Investigation 3: (refer to pages 249-250 in Teacher's Manual)

- **ELA Extensions:**
  - Create maps of fictional places
- **Math Extensions:**
  - Problem of the Week
- **Science Extensions:**
  - Find out what surveyors do
  - Construct other profiles
  - View online activities

Investigation 4: (refer to pages 288-290 in Teacher's Manual)

- **ELA Extensions:**
  - Research natural resources in your region
- **Math Extensions:**
  - Problem of the Week
- **Science Extensions:**
  - Make "concrete" using plaster of paris
  - Contact your local NRCS office
  - Invite a cement worker to class
  - Take a field trip to an aggregate supplier
- **Art Extension:**
  - Research earth materials for decoration

MA.4.OA.C.5	Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.
LA.RI.4.1	Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.

LA.RI.4.2	Determine the main idea of a text and explain how it is supported by key details; summarize the text.
LA.RI.4.3	Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.
LA.RI.4.4	Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.
LA.RI.4.5	Describe the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.
LA.RI.4.6	Compare and contrast a firsthand and secondhand account of the same event or topic; describe the differences in focus and the information provided.
LA.RI.4.7	Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.
LA.RI.4.8	Explain how an author uses reasons and evidence to support particular points in a text.
LA.RI.4.9	Integrate and reflect on (e.g., practical knowledge, historical/cultural context, and background knowledge) information from two texts on the same topic in order to write or speak about the subject knowledgeably.
LA.RI.4.10	By the end of year, read and comprehend literary nonfiction at grade level text-complexity or above, with scaffolding as needed. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.
LA.SL.4.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.
LA.SL.4.2	Paraphrase portions of a text read aloud or information presented in diverse media and formats (e.g., visually, quantitatively, and orally).
LA.SL.4.5	Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.

Resources

FOSSweb provides a list of recommended resources for each module. These resources include listings for nonfiction and fiction books for students, resource books for teachers, websites, images, videos, and local resources that extend the hands-on science activities in each module.

URL : https://www.fossweb.com/web/foss-fossweb/additional-resources-books-xslt?dDocName=G4369415#non-fiction-books

Description: Here is a list of recommended nonfiction books about Soils

URL: https://www.fossweb.com/web/foss-fossweb/additional-resources-books-xslt?dDocName=G4369415#fiction-books

Description: Here is a list of recommended fiction books about Soils

URL: https://www.fossweb.com/foss-content?htmlContentID=G3898593

Description: Here are the Interactive Whiteboard files that accompany this module

URL: water.usgs.gov

Description: Is the water safe for drinking? Can fish and other aquatic life thrive in streams and lakes that are affected by human activities? What is the water quality? To answer these questions, check out this U.S. Geological Survey site to find out what water quality means, how it is determined, and the natural processes and human activities that affect water quality.

URL: walrus.wr.usgs.gov

Description: USGS earth scientists provide a limited service in which you may ask scientific questions about geology, geophysics, and geochemistry. You can e-mail any questions you have about earth science to geologists at this site, and you can browse through their frequently asked questions.

URL: www.stategeologists.org

Description: Includes links to websites and information from the various state geological surveys.

URL: www.billnye.com

Description: This site contains Bill Nye the Science Guy's online labs which contain chemistry experiments.

URL: pubs.usgs.gov

Description: This online booklet describes the source and appearance of many of the stones used in building Washington, D.C. The buildings have been constructed with rocks from quarries throughout the United States and many distant lands. Each building shows important features of various stones and the geologic environment in which they were formed.

URL: www.awg.org

Description: This site from the Association of Women Geoscientists includes career information plus profiles of many women who have made geoscience a career.

URL: www.agiweb.org

Description: Includes brochures, articles, profiles, and links to information about careers in the geosciences.

URL: guide.agiweb.org

Description: The American Geological Institute has included an online version of their pamphlet concerning earth science careers. It also includes addresses to connect with for more information.

URL: vulcan.wr.usgs.gov

Description: The U.S.G.S. Cascades Volcano Observatory in Vancouver, Washington maintains a website with up-to-date information about volcanoes in the northwestern United States and around the world.

URL: fermi.jhuapl.edu

Description: This site includes a number of downloadable maps and satellite images for each state.

URL: chemistry.about.com

Description: Includes information and recipes for homemade crystals, including alum, sodium thiosulfate, and rock candy. Young students may require adult supervision.

URL: earth.jsc.nasa.gov

Description: Search this NASA website for images and information about Earth's various water habitats. Photos are aerial views taken from the Space Shuttle.

URL: earthexplorer.usgs.gov

Description: Search for digitized aerial photographs for your area, using either a map, key word, or with latitude and longitude

URL: earthquakes.usgs.gov

Description: A great site from the U.S. Geological Survey with all sorts of information about earthquakes, including the science of earthquakes, science fair project ideas, puzzles and games, and information about the latest earthquakes

URL: eros.usgs.gov

Description: Information about maps and aerial photographs of the U.S. that are available for purchase.

URL: www.nps.gov

Description: This animated flight is the product of a partnership between NASA, the NPS, and the USGS, and is a part of the NPS Views Project created for a soon to be released Grand Canyon geology module.

URL: www.chem.purdue.edu

Description: All about the microscopic differences between gases, liquids, and solids.

URL: www.nature.nps.gov

Description: Learn about the geologic history and environment of Carlsbad Caverns National Park in New Mexico. This site National Park Service website includes maps, a photo album, other links and resources, a glossary of terms, and teacher features.

URL: www.nature.nps.gov

Description: You can learn about the geologic history and natural environment about Yosemite National Park in California at this website. This National Park Service website includes park geology, park maps, a photo album, selected links, visitor information, and a teacher feature.

URL: www.eia.doe.gov

Description: This site includes a variety of resources involving energy, including geothermal energy.

URL: www.pbs.org

Description: This PBS/Nova site includes an interactive game that lets you find your way with a compass. You can play it online if you have right plug-ins or download a Mac or Windows version.

URL: www.google.com

Description: Download free software that allows you to view satellite images covering the entire globe. You can fly through landscapes, and you can even tilt the Earth's surface so you can see mountains, and even Grand Canyon, in profile.

URL: www.ucmp.berkeley.edu

Description: A description of the La Bea tar pits in Los Angeles, from the University of California Museum

of Paleontology.

URL: www.theimage.com
Description: This commercial site includes images of a number of common and rare minerals with information about their properties.
Museum of Paleontology

URL: www.livescience.com
Description: This site includes a description of the phenomena known as "singing sands" and includes images and audio of various types and locations.

URL: pubs.usgs.gov
Description: This pamphlet from the U.S. Geological Survey includes useful information and terms concerning natural gemstones. For example, a natural gemstone is a mineral, stone, or organic matter that can be cut and polished or otherwise treated for use as jewelry or other ornament. A precious gemstone has beauty, durability, and rarity, whereas a semiprecious gemstone has only one or two of these qualities. A gem is a gemstone that has been cut and polished.

URL: www.saltthesandbox.org
Description: Information and tips on local rock collecting. Have you found rocks like these? Maybe you can get some ideas for finding rocks in your neighborhood! Join nine-year-old Ethan and eight-year-old Aaron as they collect, wash, identify, store, and play with the rocks they've found.

URL: www2.nature.nps.gov
Description: This site includes information about the geology of many U.S. National parks. Includes a geology photo database.

URL: www.pilgrim-monument.org
Description: The Pilgrim Monument is the tallest all-granite structure in the United States and is built entirely of granite from Stonington, Maine. The tower is 77 meters (252 feet 7-1/2 inches) high. The top of the Monument is 109 meters (353 feet) above sea level. This website describes the monument and Provincetown Museum in words and photographs.

URL: www.nps.gov
Description: Ranger Minutes are short audiocasts or videocasts in which a park ranger shares interesting stories and information about Grand Canyon National Park. Teachers may want to review this first so they can point students to related videos.

URL: easyscienceforkids.com
Description: Rivers of Life is a place where students can find a variety of information about rivers from around the world.

URL: www.rockofages.com
Description: Founded in 1885, Rock of Ages has grown to include dozens of quarries producing the highest combined volume of dimensional granite in North America. From Barre Gray Granite, the finest gray granite available, to the unrivaled purity of Bethel White, Rock of Ages has very high standards for the granite it quarries and delivers. Primary students may need adult assistance with this site.

URL: www.sandcastlecentral.com
Description: Check out their tips and tricks to building great sand castles, and see the incredible photos of

sand-sculpture competitions.

URL: education.usgs.gov
Description: Use resources from the U.S. Geological Survey to create a map of your schoolyard using aerial photographs and try other geology-related activities.

URL: earthobservatory.nasa.gov
Description: Nearly a week after Hurricane Irene drenched New England with rainfall in late August 2011, the Connecticut River was spewing muddy sediment into Long Island Sound and wrecking the region's farmland just before harvest. The Thematic Mapper on the Landsat 5 satellite acquired this true-color satellite image on September 2, 2011.

URL: www.surveyhistory.org
Description: One of the main tasks of a surveyor is to measure the surface of the Earth. Check out some early tools used by the surveyor and find out about their purpose and uses.

URL: water.usgs.gov
Description: Opening the jet tubes at Glen Canyon Dam on March 26, 1996, released from Lake Powell a controlled flood of water that traveled down the Colorado River in Grand Canyon. How fast did the water move? How long did it take for water to reach a particular point along the river?

URL: www.tarpits.org
Description: The website for the La Brea tar pits in Los Angeles. Explore how the tar pits formed, what types of plants and animals became trapped, and how scientists have used these fossil deposits to open a window into the world of prehistoric Los Angeles.

URL: www.tryscience.org
Description: Find out about more than 400 science and technology centers and museums worldwide. Use an interactive map of the world to find and explore a science and technology center or museum near you. You can also find online adventures and field trips, ideas for experiments at home, plus live webcams. TryScience.org is your gateway to experience the excitement of contemporary science and technology through on and offline interactivity with science and technology centers worldwide. TryScience is brought to you through a partnership between IBM Corporation, the New York Hall of Science (NYHOS), the Association of Science-Technology Centers (ASTC), and science centers worldwide.

URL: geography.usgs.gov
Description: From here you can learn more about USGS aerial photographs and satellite imagery, as well as locate resources for ordering publications and photographs.

URL: www.us-national-parks.net
Description: Provides information on all U.S. national parks. Includes information that will be of assistance in planning a trip or obtaining data about a park.

URL: volcano.oregonstate.edu
Description: A great resource for information about volcanoes.

URL: www.windows2universe.org
Description: From the Windows to the Universe web site, this section describes our planet Earth and explains why water is so important to this planet and life itself. Find out Amazing Water Facts and how the Water Cycle works.

URL: ww2010.atmos.uiuc.edu

Description: This site from the Department of Atmospheric Sciences (DAS) at the University of Illinois at Urbana-Champaigne includes a nice animation of the water cycle including various processes such as evaporation and condensation along with maps and photographs to illustrate them.

URL: ga.water.usgs.gov
Description: This site is part of the USGS Water Science for Schools web pages. Follow a drip through text and graphs as it travels around the water cycle.

URL: wwwga.usgs.gov
Description: The U.S. Geological Survey's (USGS) Water Science for Schools web site offers information on many aspects of water, along with pictures, data, maps, and an interactive center where you can give opinions and test your water knowledge.Spanish and Chinese versions also available.

URL: www.ucmp.berkeley.edu
Description: A description of two different saber-toothed cats, from the University of California Museum of Paleontology.

URL: www.nps.gov
Description: Find loads of information about Yellowstone National Park at this National Park Service website. Topics include nature and science, for kids, education, and facts.

URL: www.nps.gov
Description: Floods in Yosemite Valley aren't uncommon during spring runoff, when the Merced River swells with melted snow and overflows into meadows. The largest, least common floods occur during winter--most recently in January 1997. Watch a six-minute video to see what Yosemite Valley looked like during the floods of May 1996 and January 1997. You can also download a Quicktime version of the video.

21st Century Skills

CRP.K-12.CRP5.1	Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.
CRP.K-12.CRP6.1	Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.
CRP.K-12.CRP8.1	Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.

CRP.K-12.CRP11.1	Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.