

Missouri Science Standards: Earth Science

Kindergarten

Scope and Sequence –Weather and Seasons

- Describe how the seasons affect the behavior of plants and animals.
- Describe how the seasons affect the everyday life of humans (e.g., clothing, activities)
- Recognize moving air is felt as wind
- *Observe and describe daily weather: precipitation (e.g., snow, rain, sleet, fog), wind (i.e., light breezes to strong wind), cloud cover, temperature*
- Observe and describe the general weather conditions that occur during each season

Scope and Sequence – Objects in the Sky

- Observe and describe the presence of the Sun, moon, and stars in the sky
- Recognize there are more stars in the sky than anyone can easily count, but they are not scattered evenly and vary in brightness
- Describe the Sun as only being seen in the daytime
- Recognize the Sun appears to move across the sky from morning to night
- Observe the moon can be seen sometimes at night and sometimes during the daytime
- Recognize the moon appears to change shape over the course of a month

Scope and Sequence – Weather and Seasons

- Observe and describe the characteristics of the four seasons as they cycle through the year (summer, fall, winter, spring)
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Grade 1

Scope and Sequence – Characteristics of Plants and Animals

- Identify ways man depends on plants and animals for food, clothing, and shelter

Scope and Sequence – Observing Water and Weather

- Observe, measure, record weather data throughout the year (i.e., cloud cover, temperature, precipitation, wind speed) by using thermometers, rain gauges, wind socks
 - Compare temperatures in different locations (e.g., inside, outside, in the sun, in the shade)
 - Compare weather data observed at different times throughout the year (e.g., hot vs. cold, cloudy vs. clear, types of precipitation, windy vs. calm)
 - Recognize patterns indicating relationships between observed weather data and weather phenomena (e.g., temperature and types of precipitation, clouds and amounts of precipitation)
 - Observe and describe ways water, both as a solid and liquid, is used in every day activities at different times of the year (e.g., bathe, drink, make ice cubes, build snowmen, cook, swim)
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Grade 2

Scope and Sequence – Earth Materials: Rocks and Soils

- Observe and describe the physical properties (e.g., odor, color, appearance, relative grain size, texture, absorption of water) and different components (i.e., sand, clay, humus) of soils
 - Observe and describe the physical properties of rocks (e.g., size, shape, color, presence of fossils)
 - Observe and recognize examples of slow changes in the Earth's surface and surface materials (e.g., rock, soil layers) due to processes such as decay (rotting), freezing, thawing, breaking, or wearing away by running water or wind
 - Observe and describe ways humans use Earth's materials (e.g., soil, rocks) in daily life
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Grade 3

Scope and Sequence – Investigating States of Matter

- Recognize liquid water can change into a gas (vapor) in the air
- Recognize clouds and fog are made of tiny droplets of water
- Recognize air is a substance that surrounds us, takes up space, and moves around us as wind
- Describe clouds and precipitation as forms of water

Scope and Sequence – Earth, Sun, and Moon

- Describe our Sun as a star because it provides light energy to the solar system
 - Recognize the moon is a reflector of light
 - Illustrate and describe how the Sun appears to move slowly across the sky from east to west during the day
 - Illustrate and describe how the moon appears to move slowly across the sky from east to west during the day and/or night
 - Observe the change in the moon's appearance relative to time of day and month over several months and note the pattern in this change
 - Recognize there is a day/night cycle every 24 hours
 - Describe the changes in length and position (direction) of shadows from morning to midday to afternoon
 - Describe how the Sun's position in the sky changes the length and position of shadows
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Grade 4

Scope and Sequence – Changes in the Earth's Surface

- Compare and contrast common fossils found in Missouri (i.e., trilobites, ferns, crinoids, gastropods, bivalves, fish, mastodons) to organisms present on Earth today

<http://flashyourbrain.com/pieces/fossils/index.php>

www.classzone.com/books/earth_science/terc/content/visualizations/es2901/es2901page01.cfm?chapter_no=visualization

- Identify and describe the components of soil (e.g., plant roots and debris, bacteria, fungi, worms, types of rock) and its properties (e.g., odor, color, resistance to erosion, texture, fertility, relative grain size, absorption rate)

http://school.discoveryeducation.com/schooladventures/soil/down_dirty.html

- Compare the physical properties (i.e., size, shape, color, texture, layering, presence of fossils) of rocks (mixtures of different Earth materials, each with observable physical properties)

http://www.classzone.com/books/earth_science/terc/content/investigations/es0602/es0602page01.cfm?chapter_no=investigation

<http://www.bbc.co.uk/schools/gcsebitesize/chemistry/changestoearthandatmosphere/0rocksrev1.shtml>

- Observe and describe the breakdown of plant and animal material into soil through decomposition processes (i.e., decay, rotting, composting, digestion)

<http://www.soil-net.com/>

- Identify the major landforms on Earth (i.e., mountains, plains, oceans, river valleys, coastlines, canyons)

<http://www.pbs.org/wgbh/aso/tryit/tectonics/#>

www.classzone.com/books/earth_science/terc/content/visualizations/es0806/es0806page01.cfm?chapter_no=visualization

- Describe how weathering agents (e.g., water, chemicals, temperature, wind, plants) cause surface changes that create and/or change Earth's surface materials and/or landforms

http://www.classzone.com/books/earth_science/terc/content/visualizations/es1201/es1201page01.cfm?chapter_no=visualization

- Describe how erosional processes (i.e., action of gravity, waves, wind, rivers, glaciers) cause surface changes that create and/or change Earth's surface materials and/or landforms

www.classzone.com/books/earth_science/terc/content/visualizations/es1305/es1305page01.cfm?chapter_no=visualization

http://www.classzone.com/books/earth_science/terc/content/visualizations/es1606/es1606page01.cfm?chapter_no=visualization

<http://svs.gsfc.nasa.gov/search/Keyword/Erosion.html>

- Identify the ways humans affect the erosion and deposition of Earth's materials (e.g., clearing of land, planting vegetation, paving land, construction of new buildings)

<http://www.nationalgeographic.com/eye/floods/floods.html>

- Propose ways to solve simple environmental problems (e.g., recycling, composting, ways to decrease soil erosion) that result from human activity

http://www.recyclenow.com/fun_stuff/what_else_is_out_there/want_to_know.html

http://www.recyclenow.com/fun_stuff/games_and_animations/in_your_bin.html

Grade 5

Scope and Sequence – Water Cycle and Weather

- Classify major bodies of surface water (e.g., rivers, lakes, oceans, glaciers) as fresh or salt water, flowing or stationary, large or small, solid or liquid, surface or groundwater
- Relate the type of water body to the process by which it was formed
- Recognize the atmosphere is composed of a mixture of gases, water, and minute particles

<http://www.reachoutmichigan.org/funexperiments/agesubject/lessons/other/airlesson.html>

www.reachoutmichigan.org/funexperiments/agesubject/lessons/other/whatwind.html

www.reachoutmichigan.org/funexperiments/agesubject/lessons/energy/greenhouse.html

<http://darylscience.com/Demos/CloudLab.html>

- Describe and trace the path of water as it cycles through the hydrosphere, geosphere, and atmosphere (i.e., the water cycle: evaporation, condensation, precipitation, surface run-off/ groundwater flow)

<http://www.montana.edu/wwwet/journey.html>

- Identify the different forms water can take (e.g., snow, rain, sleet, fog, clouds, dew) as it moves through the water cycle

<http://earthguide.ucsd.edu/earthguide/diagrams/watercycle/index.html>

- Identify and use appropriate tools (i.e., thermometer, anemometer, wind vane, hygrometer, barometer, rain gauge, satellite images, weather maps) to collect weather data (i.e., temperature, wind speed and direction, relative humidity, air pressure, precipitation, cloud type and cover)

[http://ww2010.atmos.uiuc.edu/\(Gh\)/home.xml](http://ww2010.atmos.uiuc.edu/(Gh)/home.xml)

www.classzone.com/books/earth_science/terc/content/visualizations/es2002/es2002page01.cfm?chapter_no=visualization

<http://www.reachoutmichigan.org/funexperiments/agesubject/caps.html>

- Recognize and summarize relationships between weather data (e.g., temperature and time of day, cloud cover and temperature, wind direction and temperature) collected over a period of time

<http://earthguide.ucsd.edu/earthguide/diagrams/energybalance/energybalance.swf>

<http://darylscience.com/Demos/CloudEnergy.html>

<http://sealevel.jpl.nasa.gov/gallery/tiffs/videos/seasons.mov>

- Explain how major bodies of water are important natural resources for human activity (e.g., food, recreation, habitat, irrigation, solvent, transportation)
- Describe how human needs and activities (e.g., irrigation, damming of rivers, waste treatment, sources of drinking water) have affected the quantity and quality of major bodies of fresh water

<http://ga.water.usgs.gov/edu/urbanquality.html>

<http://www.trinity.wa.edu.au/plduffyrc/subjects/sose/geography/respop/watcycle.htm>

<http://ga.water.usgs.gov/edu/watercycleplacemat.html>

http://www.epa.nsw.gov.au/soe/soe2000/bw/bw_fig_2.htm

- Propose solutions to problems related to water quality and availability that result from human activity

<http://ga.water.usgs.gov/edu/>

Scope and Sequence – Solar System

- Recognize the Earth is one of several planets within a solar system that orbits the Sun

http://www.classzone.com/books/earth_science/terc/content/visualizations/es0408/es0408page01.cfm?chapter_no=visualization

- Recognize planets look like stars and appear to move across the sky among the stars
- Describe physical features of the planet Earth that allows life to exist (e.g., air, water, temperature) and compare these to the physical features of the Sun, the moon, and other planets

http://svs.gsfc.nasa.gov/vis/a010000/a010000/a010065/seasons_320x240.mpg

- Recognize the moon orbits the Earth

www.ncsu.edu/scivis/lessons/earthinspace3d/earth2.html

- Sequence images of the lit portion of the moon seen from Earth as it cycles day-to-day in about a month in order of occurrence (Do NOT assess cause of moon phases)

<http://darylscience.com/Demos/MoonPhase.html>

http://www.classzone.com/books/earth_science/terc/content/visualizations/es2503/es2503page01.cfm?chapter_no=visualization

- Recognize the Earth rotates once every 24 hours

<http://www.onr.navy.mil/focus/spacesciences/observingsky/default.htm>

<http://www.bbc.co.uk/schools/gcsebitesize/physics/earthbeyond/gravityandsolarsystemrev2.shtml>

- Relate changes in the length and position of a shadow to the time of day and apparent position of the Sun in the sky, as determined by Earth's rotation

http://www.edumedia-sciences.com/a206_12-sundial.html

- Relate the apparent motion of the Sun, moon, and stars in the sky to the rotation of the Earth (Do not assess apparent motion of polar constellations)

Kansas Science Standards: Earth Science

Grades K-2

- observes, compares, and sorts earth materials.
- observes and recognizes the sun, moon, stars, clouds, birds, airplanes, and other objects in the sky.
- describes that the sun provides light and warmth.
- observes changes in the weather from day to day.
- records weather changes daily.
- discusses weather safety procedures.

Grades 3-4

- collects, observes *properties*, and *classifies* a variety of *earth materials* in his/her *environment*.
- experiments with a variety of soil types (clay, silt, sand, and loam).
- describes *properties* of water and process of the water cycle.
- observes and records the properties of *fossils* and discusses what *fossils* are.
- collects, observes *properties*, and *classifies* a variety of *earth materials* in his/her *environment*.
- experiments with a variety of soil types (clay, silt, sand, and loam).
- describes *properties* of water and process of the water cycle.
- observes and records the properties of *fossils* and discusses what *fossils* are.
- observes the moon and stars.
- observes and compares the length of shadows.
- discusses that the sun provides light and heat (electro-magnetic radiation) to maintain the temperature of the earth.
- describes changes in the surface of the earth.
- observes, describes, and records daily and seasonal weather changes.