

4TH GRADE SCIENCE

Students should be able to use science and engineering practices and understand the following content:

Science and Engineering Practices

- Development of habits of mind that are necessary for scientific thinking and that allow students to engage in science in ways similar to those used by scientists and engineers
- Asking and answering questions about the natural world
- Developing and using models to (1) build understanding of phenomena, processes and relationships, (2) test devices or solutions, or (3) communicate ideas to others
- With teacher guidance, conduct structured investigations to answer scientific questions, test predictions, and develop explanations
- Collecting and analyzing data from investigations to construct explanations and communicate results
- Using mathematical and computational thinking in collecting and communicating data
- Using technology to collect data and in communication of results

Earth Science (Water Cycle, Weather and Climate Patterns, Astronomy)

- Demonstrate an understanding of the water cycle and weather and climate patterns
- Describe some of the gases of the atmosphere
- Describe and develop models that help explain the composition of the atmosphere where weather occurs
- Develop and use models to describe the water cycle
- Distinguish between weather and climate
- Describe weather conditions that lead to severe weather
- Develop weather awareness and safety preparedness
- Describe the kinds of information that are used to predict the weather
- Construct explanations for differences in climate in a region
- Demonstrate an understanding of the locations, movements, and patterns of stars and objects in the solar system
- Develop and use models that show the locations and order of the planets in our solar system
- Describe how constellations appear to move in the sky throughout the seasons
- Explain the importance of astronomy in navigation and exploration
- Describe some of the tools used (telescopes, astrolabes, compasses, and sextants)
- Describe the patterns in the location, movement, and appearance of the Moon
- Construct explanations for the occurrence of day and night; the occurrence of shadows; and the occurrence of seasons

Physical Science (Light and Sound)

- Demonstrate an understanding of the properties of light and sound as forms of energy
- Demonstrate that white light is composed of different colors
- Develop and use models to illustrate reflection, refraction, and absorption

- Plan and conduct investigations that show what happens when light strikes materials that are transparent, translucent, or opaque
- Explain that sound is a form of energy produced by vibrating objects
- Describe the properties of sound such as pitch and volume

Life Science (Characteristics of Plants and Animals)

- Demonstrate an understanding of how the structural characteristics and traits of plants and animals allow them to survive, grow and reproduce
- Classify plants as flowering or nonflowering and animals as vertebrates or invertebrates
- Compare developmental stages of various seed plants
- Compare developmental stages of various animals
- Recognize that some characteristics are inherited and some are influenced by the environment
- Compare how humans and other animals use their senses and sensory organs
- Describe structural adaptations that plants have that allow the plant to survive and reproduce
- Describe structural adaptations that allow animals to survive in a given environment

Activities:

- Keep a daily log of the weather. Describe the clouds. Make drawings. Compare the weather to last year's weather.
- Find sayings that people used to predict or describe the weather.
- Find folk tales or stories that provided explanations for the weather.
- Make a cloud in a bottle.
- Observe the night sky. See if you can locate easily recognized constellations.
- If you have access, download a free astronomy app.
- Keep a moon journal.
- Visit a planetarium if you can.
- Some universities have open nights when you can view the night sky with their telescopes.
- With technology you could download a weather app or check forecasts online.
- Watch a program that describes safety precautions during severe weather
- Use a flashlight to determine what materials are transparent, translucent, or opaque.
- Listen to different musical instruments and notice differences in pitch and volume.
- Take a walk in your neighborhood, visit a park, or visit a zoo. Talk about the various plants and animals that you see and how they look and what they need.
- Visit a garden shop and discuss differences that you see in plants.
- Set up a terrarium or an aquarium.
- Visit a nature center, a pond, a lake, the shore, etc. Talk about the similarities and differences you see in plants and animals.

Books:

- Arnosky, Jim. *Crinkleroot's Guide to Walking in Wild Places*
- Asimov, Isaac. *Why Does the Moon Change Shape?*
- Cole, Joanna. *The Magic School Bus Inside a Hurricane*
- Cole, Joanna. *The Magic School Bus In The Haunted Museum: A Book About Sound*
- Gold, Becky. *Chasing Tornadoes*
- Nankivell-Aston, Sally and Dorothy Jackson. *Science Experiments with Light*
- Stille, Darlene R. *Tropical Rain Forests*
- Taylor, Barbara. *Look Closer: Desert Life*

Web Sites:

- AAAS Science Netlinks - www.sciencenetlinks.com
- SC Department of Natural Resources - www.dnr.state.sc.us
- eNature - www.eNature.com
- Franklin Institute - www.fi.edu
- NASA's space website for children - <http://kids.msfc.nasa.gov>
- National Weather Service: www.nws.noaa.gov