7TH 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

Physical Science (Classification and Conservation of Matter)

- Demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes
- Develop and use simple atomic models to illustrate the components of elements (position and charge of protons, neutrons, and electrons)
- Use information about elements to describe the organization of the periodic table (chemical symbol, atomic number, atomic mass, group or family)
- Classify matter as elements or compounds and mixtures as heterogeneous or homogeneous
- Use mathematical and computational thinking to describe the relationships among mass, volume, and density
- Compare the physical and chemical properties and pH of various solutions and classify solutions as being acidic, basic, or neutral
- Plan and conduct investigations about how physical and chemical changes affect the properties of different substances

Life Science (Organization in Living Systems)

- Demonstrate an understanding of how the levels of organization within organisms support the essential functions of life
- Communicate information to support claims that (1) organisms are made up of one or more cells, (2) cells are the basic unit of structure and function of organisms, and (3) cells come from existing cells
- Describe different kinds of cells (plant, animal, protest, bacteria)
- Develop models to explain and describe the structures found in cells
- Explain how some bacteria are helpful and others are harmful
- Develop an understanding of the levels of organization found in various organisms
- Construct explanations for how systems in the human body work together to support life functions

Life Science (Inheritance and Variation of Traits)

- Describe characteristics of how genetic information is transferred from parent to offspring and how environmental factors and technologies influence the transfer of genetic information
- Describe the relationship between genes and chromosomes and how these relate to inherited characteristics
- Explain how characteristics are transferred from parent to offspring via sexual reproduction
- Use Punnett squares to describe and predict patterns of inheritance
- Use mathematical and computational thinking to predict the probability of genotypes and phenotypes
- Describe how mutations may be beneficial, neutral, or harmful
- Construct scientific arguments about the potential advantages and disadvantages of use of technology in genetics and research

Life Science (Living Systems and the Environment)

- Describe characteristics of how organisms interact with and respond to the biotic and abiotic environmental components
- Describe the levels of organization within ecosystems (species, populations, communities, ecosystems, biomes)
- Describe how soil quality affects the characteristics of an ecosystem
- Predict what will happen to organisms in response to changes in the physical environment (limiting factors, natural hazards)
- Describe potential interactions and their impacts within a given ecosystem
- Develop and use food webs and food pyramids to examine energy flow and conservation of energy
- Predict how changes in the number of organisms of a species affects the balance within an ecosystem
- Discuss the potential impacts of species introduction in an ecosystem; discuss possible solutions to resolve problems

Activities:

- Examine labels to see what kinds of materials are in various products in your home
- Find an online interactive periodic table to learn more about the elements
- Listen to “The Elements Song” (You can also find this online.)
- Most garden centers have soil test kits that you can use to determine the pH of your soil
- Go on a hike to a local pond, park, nature center, or wetlands.
- Photograph the animals and plants and discuss how they live and where they get their energy
- On a map of South Carolina, identify the various ecosystems present
- Discuss animal and plant adaptations.
- Read about endangered species and the reasons they are endangered.
- Many good sources about chemistry, genetics, and seventh grade science are online. Sit down with your student and explore.

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Books:

- Beres, Samantha. *101 Things Every Kid Should Know about the Human Body*
- Bial, Raymond. *A Handful of Dirt*
- Carson, Rachel. *Silent Spring – 40th Anniversary Edition*
- The Earthworks Group. *50 Simple Things Kids Can Do To Save the Earth*
- Friedlander, Mark P, Jr. *Outbreak: Disease Detectives at Work*
- Kalumuck , Karen E. and The Exploratorium Teacher Institute. *Human Body Explorations: Hands-On Investigations of What Makes Us Tick*
- Morgan, Sally. *Life Science In Depth: Cells and Cell Function*
- Nardi, James. *World Beneath Our Feet: A Guide to Life in the Soil*
- Winner, Cherie. *Erosion*
- Walker, Richard. *Genes and DNA*

Web Sites:

- AAAS Science Netlinks - www.sciencenetlinks.com
- Biology4Kids - www.biology4kids.com
- Chem4Kids - www.chem4kids.com/
- Learning Network Parent Channel - www.familyeducation.com
- Science Made Simple - www.sciencemadesimple.com
- SC Department of Natural Resources - www.dnr.state.sc.us