

Cedar Rapids School Science Curriculum K–12



Arranged by Grade
Aligned with the Nebraska State Standards

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Science Curriculum Kindergarten

1.1 Unifying Concepts and Processes

- 1.1.1 Students will develop an understanding of systems, order and organization.
- * Assess in kindergarten.
 - * Sort objects by their characteristics.
 - * Identify and use the five senses to make observations.
- 1.1.2 Students will develop an understanding of evidence, models, and explanation.
- * Ongoing-Assessment completed in first grade.
 - * Use a globe, pictures, plus toys, body skeleton to represent objects, living things or events
- 1.1.3 Students will develop an understanding of change, constancy, and measurement.
- * Assess in first grade.
 - * Observe and describe change. (Example: Seasonal change, weather, life cycle)
 - * Compare two or more objects and use comparison vocabulary.
- 1.1.4 Students will develop an understanding.
- * Was not addressed.

1.2 Science as Inquiry

- 1.2.1 Students will develop the abilities needed to do scientific inquiry.
- * Assess at Kindergarten.
 - * Ask questions, plan and conduct a simple investigation, make observations, use simple tools and share results. (Plant unit-variety of settings, conditions.)

1.3 Physical Science

- 1.3.1 Students will develop an understanding of the characteristics of materials.
- * Observe and describe material as solid or liquid.
 - * Identify materials that will sink, float, mix or dissolve.
 - * Classify material as solid or liquid.
 - * Identify and explain ways to change a solid to liquid (water).

1.4 Life Science

- 1.4.1 Students will develop an understanding of the characteristics of living things.
- * Assess in first grade.
 - * Classify as living/non-living and explain their choice.
 - * Identify the needs of living things (food, water, air).
 - * Classify animals as living in water or on land.
 - * Classify animals by how they move, as swim, walk/crawl or fly.
- 1.4.2 Students will develop an understanding of the life cycles of organisms.
- * Assess in first grade.
 - * Match baby animals to their parent.

1.5 Earth and Space Science

- 1.5.1 Students will develop an understanding of the characteristics of earth materials.
- * Assess in kindergarten.
 - * Identify materials that make up Earth's surface (water, rock, soil).
 - * Identify water and soil as materials that support.
- 1.5.2 Students will develop an understanding of the objects in the sky.
- * Assess in first grade.
 - * Identify sun as a source of heat and light.
 - * Identify difference between day and night.
- 1.5.3 Students will develop an understanding of the changes in the earth and sky.
- * Assess in first grade.
 - * Identify the seasons and the weather associated with them.
 - * Identify the effects of weather changes on student's lives (temperature, clothing, activities, environmental changes).

1.6 Science and Technology

- 1.6.1 Students will develop an understanding of technological design.
- * Assess in kindergarten.
 - * Explain how the use of common tools is determined by their design. (Example: silverware, shovel, scissors)
- 1.6.2 Students will develop an understanding of science and technology.
- * Ongoing assessment-pass records on.
 - * Use balance scale, thermometer, and magnifying glasses to make observations.

1.7 Science in Personal and Social Perspectives.

- 1.7.1 Students will develop an understanding of personal health.
- * Assess at first
 - * Identify safety rules for home, school and community.
 - * Identify and practice good personal hygiene (brush, wash).
 - * Identify major body parts.
- 1.7.2 Students will develop an understanding of resources.
- * Assess in first grade
 - * Give examples of ways to care for the local environment (reduce, reuse, recycle, clean up, don't litter).

1.8 History and Nature of Science

- 1.8.1 Students will develop an understanding of science as a human endeavor.
- * Ongoing assessment completed in first grade.
 - * Listen to and discuss contributions to science by men and women from many places.

Science Curriculum

First Grade

1.1 Unifying Concepts and Processes

- 1.1.1 Students will develop an understanding of systems, order, and organization.
 - * Not addressed
- 1.1.2 Students will develop an understanding of evidence, models, and explanation.
 - * Ongoing, completed in first grade.
 - * Use graphs, globes, maps, pictures, toys, etc. to represent an object, living thing, or event.
- 1.1.3 Students will develop an understanding of change, constancy, and measurement.
 - * Assessed in first grade.
 - * Observe and record change.
 - * Use appropriate measurement systems (i.e. standard, nonstandard).
- 1.1.4 Students will develop an understanding of form and function.
 - * Assessed in first grade.
 - * Explain how specific characteristics of living things influence how they interact with their environment (i.e. teeth, webbed feet, long neck of giraffe, length of bird's legs, etc).

1.2 Science as Inquiry

- 1.2.1 Students will develop the abilities needed to do scientific inquiry.
 - * Assessed in kindergarten.
 - * Ask questions, plan and conduct a simple investigation, collect information, use simple tools, and share findings.
- 1.3.1 Students will develop an understanding of the characteristics of materials.
 - * Assessed in first grade.
 - * Observe and describe characteristics of common materials.
 - * Classify materials that are attracted by a magnet.
 - * Observe and classify solids, liquids, and gases.
- 1.4.1 Students will develop an understanding of the characteristics of living things.
 - * Assessed in first grade.
 - * Identify the survival needs of living things.
 - * Draw and label a plant and its parts.
 - * Identify characteristics of animal groups (i.e. mammals, birds, fish).
 - * Compare and contrast animals by their specific characteristics.
- 1.4.2 Students will develop an understanding of the life cycles of organisms.
 - * Assessed in first grade.
 - * Explain the life cycle of a living thing.

1.5 Earth and Space Science

- 1.5.1 Students will develop an understanding of the characteristics of earth materials.
 - * Not addressed.
- 1.5.2 Students will develop an understanding of the objects in the sky.
 - * Assessed in first grade.

- * Identify sun, moon, stars as objects in the sky.

1.5.3 Students will develop an understanding of the changes in the earth and sky.

- * Assessed in first grade.
- * Observe and record daily weather changes.

1.6 Science and Technology

1.6.1 Students will develop an understanding of technological design.

- * Assessed in kindergarten.
- * Explain how the use of common tools is determined by their design.

1.6.2 Students will develop an understanding of science and technology.

- * Ongoing/completed in first grade.
- * Use various tools (i.e. magnifiers, balance scale, thermometer) to make observations.

1.7 Science in Personal and Social Perspectives.

1.7.1 Students will develop an understanding of personal health.

- * Assessed in first grade.
- * Identify and explain need for safety rules.
- * Identify and explain positive personal health habits. (i.e. dental, nutrition, hygiene).

1.7.2 Students will develop an understanding of resources.

- * Assessed in first grade.
- * Identify and explain ways to care for our earth. (i.e. recycling, planting trees, litter).

1.8 History and Nature of Science.

1.8.1 Students will develop an understanding of science as a human endeavor.

- * Ongoing/Completed in first grade.
- * Listen to and discuss contributions to science made by men and women from many places.

Science Curriculum

Second Grade

4.1 Unifying Concepts and Processes.

- 4.1.1 Students will develop an understanding of systems, order, and organization.
 - * Assessed in third grade.
 - * Describe the parts that make up a system.
- 4.1.2 Students will develop an understanding of evidence, models, and explanation.
 - * Ongoing assessment/Completed in fourth grade.
 - * Create a graph or illustration that represents an object, living thing, or event.
- 4.1.3 Students will develop an understanding of change, constancy, and measurement.
 - * Ongoing assessment/Completed in fourth grade.
 - * Describe observable changes.
 - * Measure a change using appropriate tools and units of measurement.
- 4.1.4 Students will develop an understanding of form and function.
 - * Not addressed/Assessed in third grade.

4.2 Science as Inquiry.

- 4.2.1 Students will develop the abilities needed to do scientific inquiry.
 - * Ongoing assessment/Completed in fourth grade.
 - * Ask questions, plan and conduct a simple investigation, use simple tools to gather data, use the data to give reasonable explanations, and communicate the results.

4.3 Physical Science

- 4.3.1 Students will develop an understanding of the characteristics of objects and materials.
 - * Not addressed/Assessed in third grade.
- 4.3.2 Students will develop an understanding of the position and motion of objects.
 - * Not addressed/Assessed in third and fourth grades.
- 4.3.3 Students will develop an understanding of light, heat, electricity, and magnetism.
 - * Ongoing assessment/Completed in fourth grade.
 - * Describe the physical properties and uses of magnets.

4.4 Life Science

- 4.4.1 Students will develop an understanding of the characteristics of living things.
 - * Ongoing assessment/Completed in fourth grade.
 - * Identify seed and plant parts and their function.
 - * Identify that internal and external stimuli affect behavior of living things (i.e. migration, hibernation).
- 4.4.2 Students will develop an understanding of the life cycles of living things.
 - * Not addressed/Assessed in third grade.
- 4.4.3 Students will develop an understanding of living things and environments.
 - * Not addressed/Assessed in fourth grade.

4.5 Earth and Space Science

4.5.1 Students will develop an understanding of the characteristics of earth materials.
* Not addressed/Assessed in fourth grade.

4.5.2 Students will develop an understanding of objects in the sky.
* Assessed in fourth grade.
* Identify planets and their major characteristics.

4.5.3 Students will develop an understanding of the changes in the earth and sky.
* Not addressed/Assessed in third and fourth grades.

4.6 Science and Technology

4.6.1 Students will develop an understanding of technological design.
* Assessed in third grade.
* Identify a simple problem and possible solutions.

4.6.2 Students will develop an understanding of science and technology.
* Ongoing assessment/Completed in fourth grade.
* Identify tools or techniques that use scientific knowledge to solve problems.

4.6.3 Students will develop an understanding of the abilities to distinguish between natural objects and objects made by humans.
* Not addressed/Assessed in third grade.

4.7 Science in Personal and Social Perspectives.

4.7.1 Students will develop an understanding of personal health.
* Ongoing assessment/Completed in fourth grade.
* Identify the food groups and examples of foods in each.
* Identify healthy lifestyle choices.

4.7.2 Students will develop an understanding of the types of resources.
* Not addressed/Assessed in fourth

4.7.3 Students will develop an understanding of environmental changes.
* Ongoing assessment/Completed in fourth grade.
* Identify types of pollution and possible solutions.

4.7.4 Students will develop an understanding of how science and technology helps communities resolve problems.
* Ongoing assessment/Completed in fourth grade
* Identify the benefits of science and technology working together.

4.8 History and Nature of Science

4.8.1 Students will develop an understanding of science as a human endeavor.
* Ongoing assessment/Completed in fourth grade.
* Read and discuss selections on the contributions to science and technology throughout history by men and women scientists of diverse cultures.

Science Curriculum Third Grade

4.1 Unifying Concepts and Processes.

- 4.1.1 Students will develop an understanding of systems, order, and organization.
 - * Assessment in third grade.
 - * Describe the parts that make up a system (human body, food chain, weather).
- 4.1.2 Students will develop an understanding of evidence, models, and explanation.
 - * Ongoing assessment.
 - * Create a graph, model, or illustration to represent information (temperature/weather graph).
- 4.1.3 Students will develop an understanding of change, constancy, and measurement.
 - * Ongoing assessment.
 - * Use appropriate tools and units to measure.
 - * Describe observable changes (weather, changes in matter, heat).
- 4.1.4 Students will develop an understanding of form and function.
 - * Assessed in third grade.
 - * Construct a device to perform a simple task and explain how it works.

4.2 Science as Inquiry

- 4.2.1 Students will develop the abilities needed to do scientific inquiry.
 - * Ongoing.
 - * Ask questions, plan and conduct a simple investigation, gather information, and communicate the results.

4.3 Physical Science

- 4.3.1 Students will develop an understanding of the characteristics of objects and materials.
 - * Assessed in third grade.
 - * Observe and describe changes in states of matter (from solids>liquid>gas).
 - * Identify and explain that all matter has mass.
- 4.3.2 Students will develop an understanding of the position and motion of objects.
 - * Assessed in third and fourth grades.
 - * Define force and give examples of its effects.
 - * Describe the effects of friction.
 - * Identify the six simple machines.
- 4.3.3 Students will develop an understanding of light, heat, electricity, and magnetism.
 - * Ongoing assessment/Completed in fourth grade.
 - * Demonstrate that heat can flow from one object to another.
 - * Identify ways in which heat can be produced.

4.4 Life Science

- 4.4.1 Students will develop an understanding of the characteristics of living things.
 - * Ongoing assessment.
 - * Identify cells, tissues, organs, systems.

- * Describe plant processes needed for plant survival (Propagation, transpiration, reproduction, absorption).

4.4.2 Students will develop an understanding of the life cycles of living things.

- * Ongoing assessment.
- * Explain some learned characteristics and inherited characteristics of living things.
- * Describe the life cycle of a plant.

4.4.3 Students will develop an understanding of living things and environments.

- * Assessed in fourth grade.
- * Identify reasons why animals might be endangered or extinct.(Assessed in fourth)
- * Diagram a food chain.

4.5 Earth and Space Science

4.5.1 Students will develop an understanding of the characteristics of earth materials.

- * Not addressed/Assessed in fourth grade.

4.5.2 Students will develop an understanding of objects in the sky.

- * Not addressed/Assessment.

4.5.3 Students will develop an understanding of the changes in the earth and sky.

- * Assessed in third and fourth grades.
- * Draw a diagram of the water cycle.
- * Describe and measure changes in weather (temperature, precipitation, wind, air pressure).
- * Identify stratus, cumulus, and cirrus clouds.

4.6 Science and Technology

4.6.1 Students will develop an understanding of technological design.

- * Assessed at third grade.
- * Build a bridge to span a length, demonstrating it to the class and evaluate the structure, using materials given by the teacher.

4.6.2 Students will develop an understanding of science and technology.

- * Ongoing assessment/Completed in fourth grade.
- * Identify tools or techniques that use scientific knowledge to solve problems (simple machines).

4.6.3 Students will develop an understanding of the abilities to distinguish between natural objects and objects made by humans.

- * Assessed in third grade.
- * Classify an object as either natural or manufactured.

4.7 Science in Personal and Social Perspectives.

4.7.1 Students will develop an understanding of personal health.

- * Assessed in second and third grades.
- * Identify parts of tooth and proper care.
- * Identify the body systems, major organs and their functions.

4.7.2 Students will develop an understanding of the types of resources.

- * Not addressed/Assessed in fourth grade.

- 4.7.3 Students will develop an understanding of environmental changes.
- * Assessed in fourth grade.
 - * Identify natural and human influenced environmental changes (pollution).
- 4.7.4 Students will develop an understanding of how science and technology helps communities resolve problems.
- * Ongoing assessment.
 - * Identify the benefits of science and technology working together.

4.8 History and Nature of Science

- 4.8.1 Students will develop an understanding of science as a human endeavor.
- * Ongoing assessment.
 - * Read and discuss biographies of contributions of men and women in science of different cultures.

Science Curriculum

Fourth Grade

4.1 Unifying Concepts and Processes

- 4.1.1 Students will develop an understanding of systems, order, and organization.
- * Assessed in third grade.
 - * Describe the parts that make up a system and how they affect the whole system (electricity, solar system).
- 4.1.2 Students will develop an understanding of evidence, models, and explanation.
- * Ongoing assessment completed in fourth grade.
 - * Create a model to represent information and explain the ideas in more than one way (Plants without soil, electricity).
- 4.1.3 Students will develop an understanding of change, constancy, and measurement.
- * Ongoing assessment completed in fourth grade.
 - * Describe observable changes (sound, electricity, oil , oceans).
 - * Use appropriate tools and units to measure.
- 4.1.4 Students will develop an understanding of form and function.
- * Assessed in third grade.
 - * Not addressed in fourth grade.

4.2 Science as Inquiry

- 4.2.1 Students will develop the abilities needed to do scientific inquiry.
- * Ongoing assessments completed in fourth grade.
 - * Ask questions, and then plan and conduct a simple investigation, gather information, and communicate their results.

4.3 Physical Science

- 4.3.1 Students will develop an understanding of the characteristics of object and materials.
- * Assessed in third grade.
 - * Not addressed in fourth grade.
- 4.3.2 Students will develop an understanding of the position and motion of objects.
- * Assessed in third and fourth grades.
 - * Identify that sound is caused by vibrations and demonstrate how it travels.
 - * Change the pitch of sound by changing the rate of vibration.
- 4.3.3 Students will develop an understanding of light, heat, electricity, and magnetism.
- * Ongoing assessment complete in fourth grade.
 - * Create series and parallel circuits.
 - * Distinguish between reflection and refraction of light.

4.4 Life Science

- 4.4.1 Students will develop an understanding of the characteristics of living things.
- * Ongoing assessment complete in fourth grade.
 - * Describe the process of photosynthesis.

- 4.4.2 Students will develop an understanding of the life cycles of living things.
- * Assessed in third grade.
 - * Not addressed.
- 4.4.3 Students will develop an understanding of living things and environments.
- * Assessed in fourth grade
 - * Diagram a food web.
 - * Describe how humans and other living things can positively and negatively change their environment.

4.5 Earth and Space Science

- 4.5.1 Students will develop an understanding of the characteristics of earth materials.
- * Assessed in fourth grade.
 - * Identify characteristics of minerals and rocks.
 - * Describe how fossil evidence can determine what the land was like long ago.
- 4.5.2 Students will develop an understanding of objects in the sky.
- * Assessed in fourth grade.
 - * Identify objects in space.
 - * Distinguish between rotation and revolution.
- 4.5.3 Students will develop an understanding of the changes in the earth and sky.
- * Assessed in third and fourth grades.
 - * Describe how volcanoes and earthquakes change the earth's surface.
 - * Identify the causes and effects of weathering and erosion.

4.6 Science and Technology

- 4.6.1 Students will develop an understanding of technological design.
- * Assessed in third grade.
 - * Identify a simple problem and possible solutions. Implement and evaluate the implementation.
- 4.6.2 Students will develop an understanding of science and technology.
- * Ongoing assessment completed in fourth grade.
 - * Identify tools or techniques that use scientific knowledge to solve problems (electricity).
- 4.6.3 Students will develop an understanding of the abilities to distinguish between natural objects and objects made by humans.
- * Assessed in third grade.
 - * Not addressed in fourth grade.

4.7 Science in Personal and Social Perspective

- 4.7.1 Students will develop an understanding of personal health.
- * Assessed in second and third grades.
 - * Not addressed in fourth grade.
- 4.7.2 Students will develop an understanding of the types of resources.
- * Assessed in fourth grade.
 - * Identify natural resources and human impact on their availability.

- 4.7.3 Students will develop an understanding of environmental changes.
- * Assessed in fourth grade.
 - * Identify natural and human influenced environmental changes.
- 4.7.4 Students will develop an understanding of how science and technology helps communities resolve problems.
- * Ongoing assessment completed in fourth grade.
 - * Identify the benefits of science and technology working together.
- 4.8 History and Nature of Science**
- 4.8.1 Students will develop an understanding of science as a human endeavor.
- * Ongoing assessment completed in fourth grade.
 - * Explain ways science and technology are used in identified careers.

Science Curriculum

Fifth Grade

8.1 Unifying Concepts and Processes

8.1.1 Students will develop an understanding of systems, order, and organization.

- * Ongoing assessment.
- * Identify and describe key parts and functions of body systems.
- * Predict and then explain the interactions within a system and between systems.
- * Interpret cause/effect relationships within and between body systems.

8.1.2 Students will develop an understanding of evidence, models, and explanation.

- * Ongoing assessment.
- * Collect, manipulate, and analyze data from an experiment.
- * Observe and develop models. Interpret and explain the results.
- * Interpret and explain reasonableness of a conclusion.

8.1.3 Students will develop an understanding of change, constancy, and measurement.

- * Ongoing assessment.
- * Select and use appropriate measurement units.

8.1.4 Students will develop an understanding of form and function.

- * Not addressed./Assessed in sixth, seventh, and eighth grades.

8.2 Science as Inquiry

8.2.1 Students will develop the abilities needed to do scientific inquiry.

- * Ongoing assessment.
- * Identify questions and form a hypothesis.
- * Design and conduct a scientific investigation using appropriate tools and techniques to gather, analyze, and interpret data.
- * Communicate the procedure and results.

8.3 Physical Science

8.3.1 Students will develop an understanding of properties and changes of properties in matter.

- * Assessed in fifth grade
- * Identify the relationship of atoms and elements to matter.
- * Identify the parts and properties of an atom.
- * Identify and give examples of chemical and physical changes.

8.3.2 Students will develop an understanding of motion and forces.

- * Assessed in sixth grade.

8.3.3 Students will develop an understanding of the transfer of energy.

- * Assessed in sixth grade.

8.4 Life Science

8.4.1 Students will develop an understanding of the structure and function in living systems.

- * Ongoing assessment.
- * Identify the parts, functions, and interactions of body systems (skeletal, muscular, digestive, nervous, respiratory, excretory and circulatory systems).

- * Identify body changes that occur during puberty.
- * Identify and label the major layers of skin and parts found within each layer.
- * Identify and classify animals as vertebrates or invertebrates.
- * Classify plants as vascular, nonvascular, perennial, or annual.

8.4.2 Students will develop an understanding of reproduction and heredity.

- * Not addressed/Assessed in seventh grade (Life Science).

8.4.3 Students will develop an understanding of regulation and behavior.

- * Not addressed/Assessed in Life Science.

8.4.4 Students will develop an understanding of populations and ecosystems.

- * Not addressed/Assessed in Life Science.

8.4.5 Students will develop an understanding of diversity and adaptations of organisms.

- * Not Addressed/Assessed in sixth grade and Life Science.

8.5 Earth and Space Science

8.5.1 Students will develop an understanding of the structure of the earth.

- * Assessed in eighth grade.
- * Identify factors that affect surface air temperature and climate.
- * Identify agents of weathering and erosion.
- * Explain and demonstrate the water cycle.

8.5.2 Students will develop an understanding of the earth's history.

- * Assessed in eighth grade.
- * Describe earth processes that occur today and compare them to those that occurred in the past.

8.5.3 Students will develop an understanding of the earth in the solar system.

- * Assessed in fifth grade.
- * Identify and describe the three types of galaxies.
- * Describe how distance and surface temperature affect star brightness and color.

8.6 Science and Technology

8.6.1 Students will develop an understanding of technological design.

- * Ongoing assessment.
- * Identify problem, design a solution, implement and evaluate the solution and then communicate the process and findings.

8.6.2 Students will develop an understanding of science and technology.

- * Ongoing assessments.
- * Explain that solutions have intended and unintended consequences.

8.7 Science in Personal and Social Perspectives

8.7.1 Students will develop an understanding of personal health.

- * Assessed in fifth grade.
- * Explain how personal choices can directly affect a person's health (care of the body and drug abuse).

8.7.2 Students will develop an understanding of populations, resources, and environments.

* Not addressed/Assessed in seventh and eighth grades.

8.7.3 Students will develop an understanding of natural hazards.

* Assessed in fifth grade and eighth grade.

* Describe the effect of natural hazards on the environment (earthquakes, floods, and storms).

* Describe how human activities can accelerate natural changes (erosion).

8.7.4 Students will develop an understanding of risks and benefits.

* Assessed in fifth, sixth and eighth grades.

* Distinguish between infectious and non-infectious diseases and how they are contracted.

8.7.5 Students will develop an understanding of science and technology in society.

* Not addressed/Assessed in sixth and seventh grades.

8.8 History and Nature of Science

8.8.1 Students will develop an understanding of science as a human endeavor.

* Ongoing assessment.

* Read and discuss contributions to science by men and women of various ethnic backgrounds (weather, space, atoms, body systems).

8.8.2 Students will develop an understanding of the nature of science.

* Ongoing assessment.

* Explain the processes scientists use.

8.8.3 Students will develop an understanding of the history of science.

* Not addressed/Assessed in seventh and eighth grades.

Science Curriculum Sixth Grade

8.1 Unifying Concepts and Processes

- 8.1.1 Students will develop an understanding of systems, order, and organization.
- * Ongoing assessment.
 - * Create and use classification schemes to define a system (biomes, kingdoms, motion/force).
 - * Analyze and predict the interactions within a system and between systems (biomes, kingdoms, motion/force).
 - * Interpret cause/effect relationships within a system and between systems (biomes, kingdoms, motion/force).
- 8.1.2 Students will develop an understanding of evidence, models, and explanation.
- * Ongoing.
 - * Collect, manipulate, and analyze data.
- 8.1.3 Students will develop an understanding of change, constancy, and measurement..
- * Ongoing assessment.
 - * Quantify changes in systems (magnitude, rate, i.e. double powers of 10)
 - * Investigate and describe changes in terms of scale, rate, and pattern(i.e. chart, maps).
- 8.1.4 Students will develop an understanding of form and function.
- * Assessed in sixth, seventh, and eighth grades.
 - * Demonstrate how the design of an object makes it possible for that object to perform a specialized task (wider base-creates more friction).

8.2 Science as Inquiry

- 8.2.1 Students will develop the abilities needed to do scientific inquiry.
- * Ongoing
 - * Form hypotheses that can be examined through scientific investigations.
 - * Design and conduct a scientific investigation using appropriate tools and techniques to gather, analyze and interpret data.
 - * Communicate procedure and results.

8.3 Physical Science

- 8.3.1 Students will develop an understanding of properties and changes of properties in matter.
- * Not addressed, assessed in fifth grade.
- 8.3.2 Students will develop an understanding of motion and forces.
- * Assessed in sixth grade.
 - * Define and demonstrate Newton's 3 laws of motion.
 - * Describe "common forces" and demonstrate examples of each (Friction, magnetic, electrical, gravity, pressure, force, resistance).
- 8.3.3 Students will develop an understanding of the transfer of energy.
- * Investigate the characteristics of electricity.
 - * Categorize types of energy (solar, geothermal, nuclear).
 - * Explain advantages and disadvantages of different fuels.

8.4 Life Science

- 8.4.1 Students will develop an understanding of the structure and function in living systems.
- * Ongoing assessment.
 - * Categorize living organisms into 5 major kingdoms (animal, plant, protist).
 - * Describe characteristics of 5 major kingdoms.
- 8.4.2 Students will develop an understanding of reproduction and heredity.
- * Assessing Life Science.
 - * Describe the environmental impact on living organisms.
 - * Give examples of how new traits can appear as a result of a change in genetic codes.
- 8.4.3 Students will develop an understanding of regulation and behavior.
- * Not addressed/Assessed in Life Science.
- 8.4.4 Students will develop an understanding of populations and ecosystems.
- * Not addressed/Assessed in Life Science.
- 8.4.5 Students will develop an understanding of diversity and adaptations of organisms.
- * Assessed in sixth grade and Life Science.
 - * Summarize the characteristics of the 7 major biomes.

8.5 Earth and Space Science

- 8.5.1 Students will develop an understanding of the structure of the earth.
- * Not addressed.
- 8.5.2 Students will develop an understanding of the earth's history.
- * Not addressed.
- 8.5.3 Students will develop an understanding of the earth in the solar system.
- * Not addressed.

8.6 Science and Technology

- 8.6.1 Students will develop an understanding of technological design.
- * Ongoing assessment.
 - * Identify a problem.
 - * Design a solution.
 - * Implement and evaluate their solution.
 - * Communicate process and findings.
- 8.6.2 Students will develop an understanding of science and technology.
- * Ongoing assessment.
 - * Distinguish between scientific inquiry and technological design.
 - * Research and report that solutions can have intended and unintended consequences.

8.7 Science in Personal and Social Perspectives

- 8.7.1 Students will develop an understanding of personal health.
- * Not addressed Assessed in fifth grade.
- 8.7.2 Students will develop an understanding of populations, resources, and environments.
- * Not addressed./Assessed in seventh and eighth grades.

- 8.7.3 Students will develop an understanding of natural hazards.
* Not addressed./Assessed in fifth and eighth grades.
- 8.7.4 Student will develop an understanding of risks and benefits.
* Assessed in 5th, sixth and seventh grades.
* Describe risks and benefits influencing personal and social decisions (resisting peer pressure, alternatives to substance abuse, seeking help in cases of neglect or abuse).
- 8.7.5 Students will develop an understanding of science and technology in society.
* Assessed in sixth and seventh grades.
* Describe how societal challenges influence research priorities (rain forest - South America).

8.8 History and Nature of Science

- 8.8.1 Students will develop an understanding of science as a human endeavor.
* Ongoing.
* Read and discuss contributions to science of men and women, of various ethnic backgrounds and their contributions to science (energy, kingdoms/biomes, motion, Newton).
- 8.8.2 Students will develop an understanding of the nature of science.
* Ongoing.
* Create a visual image of a scientist and summarize the scientific processes they use.
- 8.8.3 Students will develop an understanding of the history of science.
* Not addressed/Assessed in seventh and eighth grades.

Science Curriculum Grades 7 through 12

7th Grade -- Life Science

8.1 Unifying Concepts and Processes

8.1.1 Students will develop an understanding of systems, order and organization.

- * Assessed seventh and eighth grades.
- * Identify and describe key parts and functions of a system, and analyze the interactions within/between systems.

8.1.2 Students will develop an understanding of evidence, models, and explanation.

- * Ongoing.
- * a) Collect, manipulate, and analyze data from an experiment.
- b) Observe and develop models.
- c) Interpret and explain results.
- d) Analyze reasonableness of procedures and conclusions.

8.1.3 Students will develop an understanding of change, constancy, and measurement.

- * Ongoing.
- * Select and use appropriate metric measurement units.
- * Quantify changes in systems. (e.g. magnitude, direction, and rate)

8.1.4 Students will develop an understanding of form and function.

- * Assessed in sixth, seventh, and eighth
- * Demonstrate how the design of an object (example-cell) makes it possible for that object to perform a specialized task (example-muscle, nervous).

8.2 Science as Inquiry

8.2.1 Students will develop the abilities needed to do scientific inquiry.

- * Ongoing.
- * Identify questions and form a hypotheses.
- * Design and conduct a scientific investigation using appropriate tools and techniques to gather, analyze and interpret data.
- * Communicate the procedure and results.

8.3 Physical Science

8.3.1 Students will develop an understanding of properties and changes of properties in matter.

- * Assessed in fifth grade.

8.3.2 Students will develop an understanding of motion and forces.

- * Assessed and addressed in sixth grade.

8.3.3 Students will develop an understanding of the transfer of energy.

- * Addressed and assessed in sixth grade.

8.4 Life Science

8.4.1 Students will develop an understanding of the structure and function in living systems

- * Ongoing.
- * Classify living things into one of seven major categories...Kingdom, phylum.
- * Describe the levels of organizations: Cells, tissues, organs, organ systems, organisms, ecosystems.
- * Compare and contrast the different cell types and structures (i.e. organelles) for living things.
- * Compare how cells sustain life through functions (e.g, growth and nutrition).
- * Describe how various organ systems interact in multi-cellular organisms.

8.4.2 Students will develop an understanding of reproduction and heredity.

- * Assessed in Life Science.
- * Compare/contrast the processes of asexual and sexual reproduction.
- * Describe the function of DNA in cell reproduction.
- * Describe how multi-cellular living things receive hereditary information from male and female sex cells.
- * Describe how unicellular organisms receive hereditary information.

8.4.3 Students will develop an understanding of regulation and behavior.

- * Assessed in life science.
- * Investigate and explain how organisms obtain and use resources, grow and reproduce and how behavior enhances their abilities.
- * Compare and contrast how organisms sense changes in internal and external environmental conditions.
- * Describe how an organism's behavior evolves through environmental adaptations.

8.4.4 Students will develop an understanding of populations and ecosystems.

- * Assessed in Life Science.
- * Analyze the living and non-living factors in an ecosystem.
- * Investigate and explain how energy entering eco systems as sunlight is transferred by producers into chemical energy and then the energy is passed from organism to organism in food webs.
- * Compare and contrast the functions of organisms in an eco system (e.g. producer, consumer, decomposer).

8.4.5 Students will develop an understanding of diversity and adaptations of organisms.

- * Assessed in sixth grade and life science.
- * Compare and contrast how the internal structures of living organisms are used in chemical processes (photosynthesis and respiration).
- * Describe how the structure of an organism is affected by environmental change.

8.5 Earth and Space Science

8.5.1 Students will develop an understanding of the structure of the earth.

- * Assessed/addressed at eighth grade.

8.5.2 Students will develop an understanding of the earth's history.

- * Assessed/addressed at eighth grade.

8.5.3 Students will develop an understanding of the earth in the solar system.

- * Assessed/addressed at eighth grade.

8.6 Science and Technology.

8.6.1 Students will develop an understanding of technological design.

- * Identify problem.

- * Design a solution.
- * Implement and evaluate the solution.
- * Communicate the process and findings.

- 8.6.2 Students will develop an understanding of science and technology.
- * Ongoing assessment.
 - * Distinguish between scientific inquiry and technological design.

8.7 Science in Personal and Social Perspectives.

- 8.7.1 Students will develop an understanding of personal health.
- * Assessed in fifth grade.

- 8.7.2 Students will develop an understanding of populations, resources, and environments.
- * Assessed in seventh and eighth grades
 - * Investigate and describe how population levels affect resources and the environment. .

- 8.7.3 Students will develop an understanding of natural hazards.
- * Not addressed.

- 8.7.4 Students will develop an understanding of risks and benefits.
- * Assessed in fifth, sixth, and seventh grades.
 - * Analyze a natural, chemical or biological hazard and effects on humans.

- 8.7.5 Students will develop an understanding of science and technology in society.
- * Assessed in sixth and seventh grades.

8.8 History and Nature of Science

- 8.8.1 Students will develop an understanding of science as a human endeavor.
- * Ongoing.
 - * Read and discuss contributions to science of men and women of various ethnic backgrounds and their contributions to science.

- 8.8.2 Students will develop an understanding of the nature of science
- * Ongoing.
 - * Explain the processes scientists use including formulating and testing a hypothesis using the scientific method.

- 8.8.3 Students will develop an understanding of the history of science.
- * On going seventh and eighth grades.
 - * Describe the difficulties experienced by scientists who had to overcome commonly held beliefs.

8th Grade--Earth Science

8.1 Unifying Concepts and Processes,

- 8.1.1 Students will develop an understanding of systems, order and organization.
- * Assessed seventh and eighth grades.
 - * Identify and describe key parts and functions of a system, and analyze the interactions within/between systems.
- 8.1.2 Students will develop an understanding of evidence, models, and explanation.
- * Ongoing.
 - * a) Collect, manipulate, and analyze data from an experiment.
 - * b) Observe and develop models.
 - * c) Interpret and explain results.
 - * d) Analyze reasonableness of procedures and conclusions.
- 8.1.3 Students will develop an understanding of change, constancy, and measurement.
- * Ongoing.
 - * Select and use appropriate metric measurement units.
 - * Quantify changes in systems. (e.g. magnitude, direction, and rate)
- 8.1.4 Students will develop an understanding of form and function.
- * Assessed in sixth, seventh, and eighth grades.
 - * Demonstrate how the design of an object makes it possible for that object to perform a specialized task.

8.2 Science as Inquiry

- 8.2.1 Students will develop the abilities needed to do scientific inquiry.
- * Ongoing.
 - * Identify questions and form a hypothesis.
 - * Design and conduct a scientific investigation using appropriate tools/techniques to gather, analyze, and interpret data.
 - * Communicate the procedure and results.

8.3 Physical Science

- 8.3.1 Students will develop an understanding of properties and changes of properties in matter.
- * Assessed/addressed in fifth grade.
- 8.3.2 Students will develop an understanding of motion and forces.
- * Assessed/addressed in sixth grade.
- 8.3.3 Students will develop an understanding of the transfer of energy.
- * Assessed/addressed in sixth grade

8.4 Life Science

- 8.4.1 Students will develop an understanding of the structure and function in living systems.
- * Assessed/addressed in seventh grade.
- 8.4.2 Students will develop an understanding of reproduction and heredity.
- * Assessed/addressed in seventh grade.

- 8.4.3 Students will develop an understanding of regulation and behavior.
* Assessed/addressed in seventh grade.
- 8.4.4 Students will develop an understanding of populations and ecosystems.
* Assessed/addressed in seventh grade.
- 8.4.5 Students will develop an understanding of diversity and adaptations of organisms.
* Assessed/addressed in seventh grade.

8.5 Earth and Space Science

- 8.5.1 Students will develop an understanding of the structure of the earth.
* Assessed in eighth grade.
* Compare/contrast the crust, mantle and core of the earth.
* Compare and contrast the destructive forces that create land forms. (Volcanoes, earth quakes, weathering and erosion).
* Compare/contrast the formation and composition of the three major rock types.
* Describe the rock cycle.
* Compare and contrast the composition of soils.
* Investigate and describe the water cycle.
* Describe the effects of different mineral compositions on surface and ground water.
* Compare/contrast the different atmospheric level.
- 8.5.2 Students will develop an understanding of the earth's history.
* Assessed in eighth grade.
* Describe how the theories of plate tectonics and continental drift provide information about the changes in Earth's structure.
* Describe how earth processes that occur today are similar to those that occurred in the past.
* Describe how fossil records provide an information as to environmental conditions when the earth was forming.
- 8.5.3 Students will develop an understanding of the earth in the solar system.
* Assessed in fifth and eighth grades.
* Compare/contrast the components of the solar system according to various characteristics. (Size, number of moons, distance from sun).
* Investigate and describe the effects of gravity on objects in the solar system.
* Describe the influence of the sun as a major source of energy, and its effects on atmospheric conditions and earth's surface.
* Investigate and describe the effect of the tilt of the earth's axis.
* Describe the movement and phases of the moon.

8.6 Science and Technology

- 8.6.1 Students will develop an understanding of technological design.
* On going assessment.
* a) Identify a problem.
* b) Design a solution.
* c) Implement and evaluate proposed design.
* d) Communicate the findings and process.
- 8.6.2 Students will develop an understanding of science and technology.
* On going assessment.
* Distinguish between scientific inquiry and technological design, and discuss how they interact.

8.7 Science in Personal and Social Perspectives.

- 8.7.1 Students will develop an understanding of personal health.
* Assessed in fifth grade.
- 8.7.2 Students will develop an understanding of populations, resources, and environments.
* Assessed in seventh and eighth grades.
* Investigate and explain that the causes of environmental degradation and resource depletion vary locally and globally.
- 8.7.3 Students will develop an understanding of natural hazards.
* Assessed in fifth and eighth grades.
* Describe the effect of natural hazards on the environment. (e.g. earthquakes, landslides)
- 8.7.4 Students will develop an understanding of risks and benefits.
* Assessed at fifth, sixth and seventh grades.
* Not assessed/addressed.
- 8.7.5 Students will develop an understanding of science and technology in society.
* Assessed in sixth and seventh grades.
* Not addressed.

8.8 History and Nature of Science

- 8.8.1 Students will develop an understanding of science as a human endeavor.
* Ongoing.
* Read and discuss the contributions to science of men and women of various ethnic backgrounds.
- 8.8.2 Students will develop an understanding of the nature of science.
* Ongoing.
* Explain the processes scientists use. (Formulating/testing hypotheses using the scientific method.)
- 8.8.3 Students will develop an understanding of the history of science.
* Ongoing seventh and eighth grades.
* Research and describe the difficulties experienced by scientists who had to overcome commonly held beliefs.

Ninth through Twelfth Grades Science Curriculum

12.1 Unifying Concepts and Processes

- 12.1.1 Students will develop an understanding of systems, order and organization.
- * Include in all on going assessment.
 - * Predict and evaluate how change within a system affects that system.
- 12.1.2 Students will develop an understanding of evidence, models, and explanation.
- * Include in all disciplines on going assessments.
 - * Create a model to show how objects and processes are connected and evaluate the reasonableness of the answer.
- 12.1.3 Students will develop an understanding of change, constancy, and measurement.
- * Include in all disciplines.-On going assessment.
 - * Use proper scientific notation to describe change by comparing one measure quantity to another.
- 12.1.4 Students will develop an understanding of form and function.
- * Include in all disciplines on going assessments.
 - * Compare and contrast function and form.
- 12.1.5 Students will develop an understanding of change over a period of time.
- * Include in all on going assessment.
 - * Explain how a system at equilibrium is affected by change.

12.2 Science as Inquiry

- 12.2.1 Students will develop the abilities needed to do scientific inquiry.
- * Include in all disciplines on going assessment.
 - * Design and conduct scientific investigations, analyze results and communicate findings.

12.3 Physical Science

- 12.3.1 Students will develop an understanding of the structure of the atom.
- * Assess physical science.
 - * Investigate and describe structure of atoms, and identifying characteristics of each element.
 - * Investigate and explain the types of nuclear reactions with the effects of electrical and nuclear forces that hold atoms together.
 - * Differentiate between fusion and fission.
- 12.3.2 Students will develop an understanding of the structure and properties of matter.
- * Assessed in physical science.
 - * Investigate and describe the bonding of carbon atoms in chains and rings to produce compounds essential to life.
 - * Investigate and describe the bonding of atoms in chains and rings to produce compounds.
 - * Investigate and describe how the structure of an atom determines the chemical properties of an element and the interactions between molecules of a compound determine its physical and chemical properties.
 - * Compare and contrast the states of matter.
 - * Investigate and explain the periodic table of elements in terms of repeating patterns of physical and chemical properties.

- * Investigate and explain the interaction of atoms with one another by transferring or sharing electrons.

12.3.3 Students will develop an understanding of chemical reactions.

- * Assess in Physical Science.
- * Investigate and describe the factors influencing the roles of chemical reaction.
- * Investigate and describe how electrons are involved in bond formation during chemical reactions.
- * Calculate and balance chemical formulas.
- * Investigate and describe the change of energy as a result of chemical reactions.

12.3.4 Students will develop an understanding of motions and forces.

- * Assess in Physical Science.
- * List and explain Newton's 3 laws of motion.
- * Describe gravity as an attractive force that each mass exerts on any other mass.
- * Investigate and describe the effect of forces on the motion of objects.

12.3.5 Students will develop an understanding of the conservation of energy and increase in disorder.

- * Assess in Physical Science.
- * State and give examples of law of conservation of matter.
- * Investigate and describe heat transfer in terms of conduction, convection and radiation.
- * Compare and contrast kinetic and potential energy.

12.3.6 Students will develop an understanding of the interactions of energy and matter.

- * Assess in Physical Science.
- * Identify characteristics of transverse and electromagnetic waves.
- * Describe the relationship between frequency, wave length. and velocity.

12.4 Life Science

12.4.1 Students will develop an understanding of the cell.

- * Assess in Biology.
- * Identify sub cellular structures and explain their function.
- * Identify different cell types (prokaryotic, eukaryotic)
- * Describe the process of cellular division.
- * Trace a specialized cell to the levels of organization.
- * Investigate and explain the differentiation of cells in the development of a multicellular organism.

12.4.2 Students will develop an understanding of the molecular basis of heredity.

- * Assess in Biology.
- * Explain how sexual reproduction increase genetic variation.
- * Investigate and explain how mutations can alter an individual organism.
- * Investigate and describe the structure and function of DNA.
- * Investigate and explain the genetic variations that occur when genetic information is transmitted during sexual reproduction.

12.4.3 Students will develop an understanding of the theory of biological evolution.

- * Assess in Biology.
- * Investigate and use the theory of biological evolution to explain diversity of life.
- * Differentiate between artificial and natural selection.

12.4.4 Students will develop an understanding of the interdependence of organisms.

- * Assess in Biology.
- * Develop a model of an ecosystem and explain the interactions of its living and nonliving components.
- * Investigate and describe the flow of energy through the ecosystem.
- * Explain the effects humans can have on an ecosystem.

12.4.5 Students will develop an understanding of matter, energy, and organization in living systems.

- * Assess in Biology.
- * Investigate and explain the transfer of energy from the sun to organic compounds.
- * Differentiate between consumers and producers.
- * Construct an ecological pyramid and communicate the relationship between the levels.

12.4.6 Students will develop an understanding of the behavior of organisms.

- * Assess in Biology.
- * Describe how organisms respond to internal changes and external stimuli.

12.5 Earth and Space Science

12.5.1 Students will develop an understanding of energy in the earth system.

- * Assessed in Physical Science and Biology.
- * Distinguish between internal and external sources of energy.
- * Investigate and explain how global climate is determined by energy transfer from the sun and is influenced by dynamic processes and static condition. (Cloud formation and the earth's rotation). (The position of mountain ranges and oceans).

12.5.2 Students will develop an understanding of geochemical cycles.

- * Investigate and diagram how elements and compounds on earth move among reservoirs in the solid earth, oceans, atmosphere, and organisms as part of geochemical cycles.

12.5.3 Students will develop a scientific understanding of the origin of the earth system.

- * Assessed in Biology.
- * Compare and contrast the early earth with the planet we live on today.
- * Explain the use of carbon 14 dating.
- * Investigate and describe how the interactions among the solid earth, oceans, atmosphere, and organisms affect the ongoing evolution of the earth.

12.5.4 Students will develop a scientific understanding of the origin of the universe.

- * Describe and analyze various theories of the origin of the universe.

12.6 Science and Technology

12.6.1 Students will develop an understanding of technological design.

- * Include in all disciplines
- * On going assessment.
- * a) Identify a problem
- b) Propose designs and choose between alternative solutions.
- c) Implement the proposed solution.
- d) Evaluate the solution and its consequences.
- e) Communicate the problem, process, solution.

12.6.2 Students will develop an understanding about science and technology.

- * Include in all disciplines.
- * Assess on going.

- * State reasons for the pursuit of science and technology and contrast the reporting of scientific and technical knowledge.

12.7 Science in Personal and Social Perspectives

12.7.1 Students will develop an understanding of personal and community health.

- * Assessed in anatomy and physiology
- * (Biology)-Investigate and explain how genetic traits affect a person's health.
- * (Anatomy and Physiology)-Investigate and describe the effect of nutritional balance on growth, development, and personal well-being.
- * (Anatomy and Physiology)-Investigate and analyze risks and benefits in making decisions about personal community health.
- * (Anatomy and Physiology)-Investigate and explain how genetic traits affect a person's health.

12.7.2 Students will develop an understanding of the effects of population change.

- * Assessed in biology.
- * (Biology)-Identify causes and effects of population growth or decline.

12.7.3 Students will develop an understanding of natural resources.

- * Assessed in biology.
- * (Biology)-Investigate and explain how population change impacts resource use and environments.
- * Compare and contrast renewable and finite resources.

12.7.4 Students will develop an understanding of environmental quality.

- * Assessed in biology.
- * (Biology)-Investigate and explain factors that influence environmental quality.

12.7.5 Students will develop an understanding of natural and human-induced hazards.

- * Assessed in biology
- * (Biology)-Investigate and distinguish between slowly and rapidly occurring natural hazards and their impact on the environment.

12.7.6 Students will develop an understanding of the role of science and technology in local, national, and global challenges.

- * (Biology)-Explain why knowledge of basic concepts about scientific and technological challenges should precede active debate.

12.8 History and Nature of Science.

12.8.1 Students will develop an understanding of science as a human endeavor.

- * Assessed in biology.
- * (Biology)-Examine the societal, cultural, and personal beliefs that influence scientists.

12.8.2 Students will develop an understanding of the nature of scientific knowledge.

- * Include in all on going physical science and biology.
- * Give examples of scientific knowledge that changed as new evidence became available.

12.8.3 Students will develop an understanding of the history of science.

- * Include in all disciplines-Ongoing assessments.
- * Investigate and describe the contributions of diverse cultures to scientific knowledge and technological inventions.