
Coal City Unit District #1
Seventh Grade
Science Curriculum

SC.7:1 Students will perform scientific investigations and communicate scientific conclusions.

SC.7:1-1 Ask scientific questions.

SC.7:1-2 Plan scientific investigations.

SC.7:1-3 Analyze scientific experiments based on their understanding of hypotheses, variables, and data collection.

SC.7:1-4 Use tools to observe and measure things within a scientific study.

SC.7:1-5 Construct and communicate conclusions from scientific experimentation.

SC.7:2 Students will demonstrate understanding of how scientists and engineers work together to better the world.

SC.7:2-1 Design scientific solutions to everyday problems. (MS-ET1-1)

SC.7:2-2 Communicate scientific solutions to everyday problems. (MS-ET1-1)

SC.7:2-3 Evaluate different solutions for their effectiveness in solving a problem. (MS-ETS1-2)

SC.7:2-4 Refine scientific solutions based on observations and data collected from investigations.

SC.7:3 Students will analyze problems involving the interaction of humans and the biosphere in order to propose a solution using their knowledge of living things.

- SC.7:3-1 Provide evidence that supports living things that are made of cells.
(MS-LS1-1)
- SC.7:3-2 Identify evidence that explains where living things come from.
- SC.7:3-3 Provide evidence that explains what living things need to stay alive,
grow, and reproduce.
- SC.7:3-4 Describe evidence that illustrates how living things are classified into
groups.
- SC.7:3-5 Describe evidence that explains how the theory of evolution supports
the classification of organisms.
- SC.7:3-6 Describe the characteristics of viruses, bacteria, protists, and fungi.
- SC.7:3-7 Explain how viruses, bacteria, protists, and fungi interact with nature
and people (animals).
- SC.7:3-8 Identify the structure and functions of different plants and animals.
- SC.7:3-9 Interpret data to determine an organism's characteristics.
- SC.7:3-10 Illustrate differences and similarities in plant and animal cells.
- SC.7:3-11 Describe animal traits.
- SC.7:3-12 Argue how cells form tissue, tissue for organs and organs form organ
systems.

**SC.7:4 Students will investigate and model the structure and function of living things.
(MS.LS1-2)**

- SC.7:4-1 Recognize the components of cell theory.
- SC.7:4-2 Recognize that cells are the basic units of life.
- SC.7:4-3 Recognize that cells of all living things extract energy from food, get rid of waste, and reproduce.
- SC.7:4-4 Distinguish between living and nonliving things based on the presence or absence of cells.
- SC.7:4-5 Identify the parts of a cell: the nucleus, chloroplasts, mitochondria, cell membrane, and cell wall.
- SC.7:4-6 Analyze how each part of a cell contributes to the function of the cell as a whole.
- SC.7:4-7 Differentiate plant and animal cells based on their structure and function.
- SC.7:4-8 Describe how cells obtain energy and remove waste materials through the cell membrane.
- SC.7:4-9 State the four functions of cell division..
- SC.7:4-10 Explain each phase of the cell cycle.
- SC.7:4-11 Explain the cause and effect relationships of cell division.
- SC.7:4-12 Identify patterns in the process of cell division.
- SC.7:4-13 Calculate the number of cells when provided with the number of divisions.

SC.7:5 Students will recognize the importance of environmental factors in the growth and reproduction of plants and animals.

- SC.7:5-1 Analyze how organisms reproduce either sexually or asexually.
- SC.7:5-2 Recognize that reproduction results in the transfer of genetic information to offspring.
- SC.7:5-3 Explain the cause and effect of how sexual reproduction produces variations in traits.
- SC.7:5-4 Use models to convey information about types of mating systems.
- SC.7:5-5 Describe how plants reproduce.
- SC.7:5-6 Compare animal migration patterns with human movement patterns.
- SC.7:5-7 Infer the relationship between fertilization strategies and parental investment.
- SC.7:5-8 Describe the effect that environmental and genetic factors can have on an organism's growth.
- SC.7:5-9 Describe the effect that genetic factors can have on an organism's growth.
- SC.7:5-10 Identify methods to stimulate plant growth.
- SC.7:5-11 Identify mechanisms that can control plant growth.
- SC.7:5-12 Identify mechanisms that control animal growth.

SC.7:6 Students explain how matter and energy cycle, particularly during photosynthesis and cellular respiration.

- SC.7:6-1 Explain how plants and other organisms use photosynthesis to make food.
- SC.7:6-2 Explain the roles of light, carbon dioxide, water, and chlorophyll in photosynthesis.
- SC.7:6-3 Identify the role of photosynthesis in the cycling of matter and energy through ecosystems.
- SC.7:6-4 Explain how organisms use cellular respiration to break down food to provide energy.
- SC.7:6-5 Explain how cells can release energy without using oxygen.
- SC.7:6-6 Explain that living systems follow the Laws of Conservation of Mass and Energy.
- SC.7:6-7 Model how food is rearranged through chemical reactions forming new molecules and releasing energy.

SC.7.7 Students will propose solutions to real-world environmental issues within their own communities and ecosystems. (MS-LS2-5)

- SC.7.7-1 Analyze data about resource availability
- SC.7.7-2 Predict the effect that different amounts and availability of resources will have on a population. (MS-LS2-1)
- SC.7.7-3 Predict the effect that resource availability will have on competition.
- SC.7.7-4 Describe how predatory interactions and symbiotic relationships influence population size.
- SC.7.7-5 Explain how changes to components of an ecosystem affect organisms and populations.
- SC.7.7-6 Analyze data about the effect of human impacts on ecosystems.
- SC.7.7-7 Describe direct and indirect values of biodiversity.
- SC.7.7-8 Describe the need to protect biodiversity globally.
- SC.7.7-9 Identify factors that affect biodiversity.
- SC.7.7-10 Explain how human population density affects biodiversity.
- SC.7.7-11 Identify the role of healthy ecosystems.
- SC.7.7-12 Identify the importance of maintaining healthy ecosystems.
- SC.7.7-13 Explain which supporting services are necessary for all other ecosystems.

SC.7.8 Students will explain how genetic changes occur naturally as well as how humans have learned to influence the genetic code for desired outcomes.

- SC.7.8-1 Identify Gregor Mendel's contributions to the fields of genetics and inheritance.
- SC.7.8-2 Describe how variations of traits between parents and offspring arise from variations of traits between genes (alleles) from each parent.
- SC.7.8-3 Predict the probability of inheritance of specific genetic variations.
- SC.7.8-4 Identify the difference between genes, alleles, and chromosomes.
- SC.7.8-5 Explain how genes, alleles, and chromosomes relate to inheritance.
- SC.7.8-6 Differentiate between meiosis and mitosis.
- SC.7.8-7 Identify the steps of DNA replication.
- SC.7.8-8 Explain how cells make protein.
- SC.7.8-9 Explain why cells undergo protein synthesis.
- SC.7.8-10 Determine sex-linked inheritance using a Punnett Square or Pedigree.
- SC.7.8-11 Explain how a genetic mutation occurs.
- SC.7.8-12 Describe the differences between harmful, beneficial and neutral mutations.
- SC.7.8-13 Explain how humans use artificial selection to produce organisms with desired traits.
- SC.7.8-14 Explain how scientists engineer new genes.
- SC.7.8-15 Explain how genetic information can be used.
- SC.7.8-16 Identify that characteristic animal behavior and specialized plant structures affect the probability of successful reproduction of animals and plants.

SC.7:9 Students will investigate factors that drive natural selection and provide evidence that supports the scientific theory of evolution.

- SC.7:9-1 Identify how organisms can change over time.
- SC.7:9-2 Use reasoning to support the theory of evolution.
- SC.7:9-3 Describe how natural selection leads to change over time in organisms using evidence.
- SC.7:9-4 Explain the roles of genes, mutations, and the environment in natural selection.
- SC.7:9-5 Interpret data about how natural selection and inherited variations influence a population.
- SC.7:9-6 Describe the influence sexual selection has on a population's genetic variation.
- SC.7:9-7 Investigate the relationship between species interactions and evolution.
- SC.7:9-8 Explain how fossils show change over time.
- SC.7:9-9 Identify what the early embryological development of different organisms tells us about evolution.
- SC.7:9-10 Explain how failure to adapt to environmental changes can lead to species extinction.
- SC.7:9-11 Explain how modern technology provides evidence that all organisms have a common ancestor.
- SC.7:9-12 Explain how modern technology has made new discoveries about evolution possible.
- SC.7:9-13 Explain how genetic variations increase some individuals' probability of surviving and reproducing in a specific environment.
- SC.7:9-14 Describe the difference between different types of extinctions.