Science Standard
Catalina Foothills School District
Grade 8

The eighth grade science program emphasizes the skills of scientific inquiry and builds on the processes of refining experimental plans, interpreting data, and evaluating investigational error. Through a rich, inquiry-based program of study, students will demonstrate scientific literacy and the use of applicable CFSD deep learning proficiencies in the physical, life, earth, and space sciences. Content is taught through an integrated approach with an emphasis on the development of major science systems, changes, and models. Students will engage in active inquiries and investigations to develop conceptual understanding and research/laboratory skills. Eighth grade science explores scientific innovations and milestones and studies major concepts in areas such as cells and heredity, structures and properties of matter, chemical interactions, forces and motion, and environmental science.

SCIENTIFIC INQUIRY

SCIENTIFIC INQUIRY: GENERATING SCIENTIFIC QUESTIONS

SC8.1a.1 Refines broad or ill-defined observational, experimental, and research questions.

SCIENTIFIC INQUIRY: PREDICTING AND HYPOTHESIZING

SC8.1b.1 Generates alternative hypotheses based on evidence.

SCIENTIFIC INQUIRY: DESIGNING INVESTIGATIONS

SC8.1c.1 Refines a plan for an experiment that includes the following: (1) list of materials with specified quantities and types, (2) labeled diagram(s) using scientific vocabulary, (3) procedure that sequentially lists significant steps and minimizes possible errors (based on a student generated question).

SCIENTIFIC INQUIRY: OBSERVATION AND DATA COLLECTION

SC8.1d.1 Includes qualitative and quantitative observations to match investigation.

SC8.1d.2 Describes and uses tools and/or technology (for example: microscope, temperature probe, sensor probe) scientists use to investigate phenomenon.

SC8.1d.3 Constructs a valid data table.

SCIENTIFIC INQUIRY: ANALYSIS AND CONCLUSION

SC8.1e.1 Interprets variations in data (for example: outliers) using statistical measures.

SC8.1e.2 Discusses investigational errors that may occur (for example: flawed experimental design, inaccurate measurement, computational error, unethical reporting).

INTERACTION OF SCIENCE AND SOCIETY

SC8.2.1 Describes how diverse people and/or cultures, past and present, have made important contributions to scientific innovation (for example: Niels Bohr, Isaac Newton, Watson and Crick, Charles Darwin, Sir Frances Bacon, Joseph Priestley, George Washington Carver, Rosalind Franklin).

SC8.2.2 Evaluates the effects of Mendelian Genetics and Newton's Laws as major scientific milestones on society.

SC8.2.3 Analyzes the risk factors and possible solutions associated with natural, human induced, and/or biological hazards (for example: waste disposal of industrial chemicals, greenhouse gases, new home/road construction in different areas – urban sprawl, alternative fuels/resources, chemical use – "Go Green" initiative).

SYSTEMS THINKING (CFSD Deep Learning Proficiency – DLP)

SYSTEMS THINKING: BIG PICTURE/INTERDEPENDENCIES

SC8.3a.1 Creates a model of key interdependent relationships by taking a whole-system perspective on an issue or process (for example: in the area of genetics - drug resistant bacteria).

SYSTEMS THINKING: CHANGE OVER TIME

SC8.3b.1 Describes a system component's continuous pattern of change over a specified period of time (for example: adaptation of an organism's survival in a desert ecosystem with increasing aridity).

SYSTEMS THINKING: LEVERAGE

SC8.3c.1 Explains what critical variable within a system produces the most leverage toward a desired change (for example: when to apply a force to get desired acceleration).

LIFE SCIENCE

CHARACTERISTICS OF LIVING THINGS

SC8.4.1 Explains the purposes of cell division (required: growth, mitosis - repair, meiosis -reproduction).

SC8.4.2 Describes how organisms change over time based on their characteristics (for example: prehistoric horse to modern horse, skeletal structure comparison – whale fin, bat wing, human hand).

SC8.4.3 Applies the principles of heredity (Mendel's Laws) to explain inherited traits (for example: eye color, widow's peak, blood type).

SC8.4.4 Distinguishes between the nature of dominant, co-dominant, and recessive traits in humans and other organisms.

INTERDEPENDENCE OF LIVING THINGS AND THEIR ENVIRONMENT

SC8.5.1 Describes an organism's ability to maintain homeostasis (for example: a lizard will sun itself, but not when it rains).

SC8.5.2 Compares the symbiotic (required: parasitism – mistletoe/tree, commensalism – clown fish/sea anemone, mutualism - lichen) and competitive (required: native and non-native species) relationships in organisms within an ecosystem.

SC8.5.3 Explains the benefits of behavioral cycles of organisms (required: hibernation, migration, dormancy - plants).

SC8.5.4 Describes adaptations that aid the survival of organisms over time (required: protective colorations, beak designs, seed dispersal mechanisms, pollination methods).

PHYSICAL SCIENCE

STRUCTURE AND PROPERTIES OF MATTER

SC8.6.1 Describes the structure and history of the atom.

SC8.6.2 Classifies matter as elements, compounds, and mixtures.

SC8.6.3 Describes matter using physical (for example: density, melting point, boiling point, solubility) and chemical (for example: reactivity, pH, oxidation/corrosion) properties.

SC8.6.4 Describes the systematic organization of the periodic table.

INTERACTIONS OF MATTER

SC8.7.1 Justifies a chemical reaction has occurred based on evidence (required: formation of a precipitate, generation of gas, color change, absorption or release of energy).

SC8.7.2 Explains motion of objects using Newton's Laws (required: continue in their state of motion-1st Law, accelerate due to the application of force - 2nd Law, interact with other objects - 3rd Law).

CONSERVATION AND TRANSFORMATION OF ENERGY

SC8.8.1 Explains how the transfer of energy can affect the physical and chemical properties of matter.

EARTH AND SPACE SCIENCE

STRUCTURE AND PROCESSES OF THE EARTH

Not assessed at this level.

STRUCTURE AND PROCESSES OF OBJECTS IN SPACE

Not assessed at this level.