

**Science Standard
Catalina Foothills School District
Grade 5**

The fifth grade science program emphasizes the skills of scientific inquiry and builds on the processes of generating questions and hypotheses, data collection, and analysis. 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 science themes and systems thinking. Students will engage in active inquiries and investigations to develop conceptual understanding and research/laboratory skills. Fifth grade science promotes the study of cultural diversity and scientific contributions, and invites students to explore new concepts in the areas of matter, forces, simple machines, human body, and the solar system.

SCIENTIFIC INQUIRY

SCIENTIFIC INQUIRY: GENERATING SCIENTIFIC QUESTIONS

SC5.1a.1 Writes observational, experimental, and research questions based on a prompt (for example: teacher prompt - the heart circulates blood around the body: observational – Where can you feel your heart beat around your body? / experimental – How does exercise affect your heart rate? / research – How does the heart work?).

SCIENTIFIC INQUIRY: PREDICTING AND HYPOTHESIZING

SC5.1b.1 Generates a testable hypothesis in an “if/then/because” format (for example: If I exercise, then my heart rate will increase because my muscles need blood to circulate faster).

SCIENTIFIC INQUIRY: DESIGNING INVESTIGATIONS

SC5.1c.1 Determines the independent and dependent variables in investigations.

SC5.1c.2 Writes a plan for an experiment that includes (1) list of materials, (2) diagram with important elements labeled, (3) appropriate measurement tools, and (4) procedure that sequentially lists steps, including a control (for example: variable, group, factor) and multiple trials.

SC5.1c.3 Evaluates a plan for an experiment based on a “fair test” (control of a variable during multiple trials).

SCIENTIFIC INQUIRY: OBSERVATION AND DATA COLLECTION

SC5.1d.1 Organizes data as qualitative or quantitative.

SC5.1d.2 Evaluates which scale (appropriate for range of data to be plotted) and tool are most appropriate to describe the relevant data (for example: spring scale to measure Newton’s law of force, protractor to measure angle of shadow on a sundial).

SC5.1d.3 Records relevant attributes and values of data.

SCIENTIFIC INQUIRY: ANALYSIS AND CONCLUSION

SC5.1e.1 Analyzes data for consistency with proposed hypothesis and research question(s), and communicates findings.

SC5.1e.2 Develops new questions and logical predictions that arise from the results and conclusions of an investigation.

INTERACTION OF SCIENCE AND SOCIETY

SC5.2.1 Describes how diverse people and/or cultures, past and present, have made important contributions to scientific innovation (for example: Edmund Halley, Isaac Newton, Edwin Hubble, Galileo Galilei).

SC5.2.2 Explains the impacts of natural hazards on the environment (for example: global warming, floods, asteroid or large meteor impact).

SC5.2.3 Describes the role of science and technology in efforts to explore space (for example: Apollo missions, space shuttles, Hubble Space Telescope).

SC5.2.4 Evaluates strengths and weaknesses of a proposed solution to a specific human, animal, or environmental need (for example: design a house which reduces greenhouse gas emissions by reducing the energy use).

SYSTEMS THINKING (CFSD Deep Learning Proficiency – DLP)

SYSTEMS THINKING: BIG PICTURE

SC5.3a.1 Creates a model of key interdependent relationships by taking a whole-system perspective on an issue or process (for example: stock flow map of Venus' greenhouse effect with infrared rays going into the atmosphere and unable to escape).

SYSTEMS THINKING: CHANGE OVER TIME

SC5.3b.1 Describes a system component's continuous pattern of change over a specified period of time (for example: graph the amount of light reflected off the moon, creating the moon phases over time).

SYSTEMS THINKING: INTERDEPENDENCIES

SC5.3C.1 Explains circular causality as an ongoing reinforcing or balancing process (for example: heart rate changes because the brain knows that the body needs more or less oxygen – feedback loop).

LIFE SCIENCE

CHARACTERISTICS OF LIVING THINGS

SC5.4.1 Describes the relationship between the structures and functions of the skeletal system (required: protection–rib cage, cranium; support–vertebrae; movement–pelvis, femur, hip).

SC5.4.2 Describes the structure and function of muscles (required: cardiac–heart; smooth–stomach; skeletal–biceps).

SC5.4.3 Describes the structures and functions of the nervous system (required: control center–brain; relay mechanism–spinal cord; transport messages–nerves).

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REQUIRED INVESTIGATIONS: You and Your Body – DSM III; Simple Machines – DSM III, Newton's Toy Box – DSM III; Solar System – DSM III

SC5.4.4 Distinguishes between voluntary and involuntary responses.

INTERDEPENDENCE OF LIVING THINGS AND THEIR ENVIRONMENT

Not assessed at this level.

PHYSICAL SCIENCE

STRUCTURE AND PROPERTIES OF MATTER

SC5.6.1 Describes the relationship between atoms (for example: H, N, Na) and molecules (for example: H₂O, CO₂).

SC5.6.2 Explains the properties of mixtures and compounds (for example: separating simple mixtures; using a table/chart to compare properties of each).

SC5.6.3 Describes changes in matter (for example: physical–cutting wood, freezing water; chemical–burning wood, rusting iron).

INTERACTIONS OF MATTER

SC5.7.1 Describes the effects that forces (gravity and friction) can have on an object (for example: changes in motion - stop, start, change direction, speed up, slow down; changes in shape).

SC5.7.2 Describes how simple machines help us do work (required: trade force for distance or change the direction of the force).

CONSERVATION AND TRANSFORMATION OF ENERGY

Not assessed at this level.

EARTH AND SPACE SCIENCE

STRUCTURE AND PROCESSES OF THE EARTH

SC5.9.1 Distinguishes between effects of earth's revolution (orbit), rotation (spin), and tilt of axis.

STRUCTURE AND PROCESSES OF OBJECTS IN SPACE

SC5.10.1 Describes the role of gravity as an attractive force between celestial objects.

SC5.10.2 Describes the distinguishing characteristics of the known planets in the solar system.

SC5.10.3 Describes various objects in the sky (for example: asteroids, comets, stars, meteors/shooting stars).

SC5.10.4 Explains real and apparent motion of the sun, moon, planets, and stars (required: moon phases).