ScienceSaurus: A Student Handbook © 2005
correlated to
Grade Level Expectations for the Sunshine State Standards
Grade 4

Strand A: The Nature of Matter

Standard 1

The student understands that all matter has observable, measurable properties.

Benchmark SC.A.1.2.1

The student determines that the properties of materials (e.g., density and volume) can be compared and measured (e.g., using rulers, balances, and thermometers).

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. uses a variety of measurements to compare and contrast the physical properties of matter.	**Student Handbook:** 38-50, 244-245

Benchmark SC.A.1.2.2

The student knows that common materials (e.g., water) can be changed from one state to another by heating and cooling.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. understands that heating or cooling of matter will speed up or slow down, respectively, the motion of the small particles within matter and that this is what causes a phase change.	**Student Handbook:** 261

Standard 2

The student understands the basic principles of atomic theory.

Benchmark SC.A.2.2.1

The student knows that materials may be made of parts too small to be seen without magnification.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. uses a variety of tools (hand lens, microscope) to observe and study minute details of objects.	**Student Handbook:** 51, 52-53, 359, 361

Strand B: Energy

Standard 1

The student recognizes that energy may be changed in form with varying efficiency.

Benchmark SC.B.1.2.1

The student knows how to trace the flow of energy in a system (e.g., as in an ecosystem).

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows that most living things use energy from the Sun to live and grow.	**Student Handbook:** 133, 137, 287, 399
2. knows how to trace the flow of energy in a system (for example, in an ecosystem).	**Student Handbook:** 133, 138

Benchmark SC.B.1.2.2

The student recognizes various forms of energy (e.g., heat, light, and electricity).

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows that there are a variety of sources for electricity (for example, hydroelectric, geothermal, windmills).	**Student Handbook:** 286, 325, 326, 327
2. knows the relationship between attributes of all waves (for example, wavelength, frequency) and attributes of sound waves (for example, pitch, intensity).	**Student Handbook:** 311, 316, 317

Benchmark SC.B.1.2.3

The student knows that most things that emit light also emit heat.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows that most objects that emit light also emit heat.	**Student Handbook:** 286

Benchmark SC.B.1.2.4

The student knows the many ways in which energy can be transformed from one type to another.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows ways that energy can be transformed (for example, electricity to light, light to heat, mechanical to heat).	**Student Handbook:** 286, 290
2. knows that moving electric charges produce magnetic forces and moving magnets produce electric currents.	**Student Handbook:** 272-273, 304-305, 306-307

Benchmark SC.B.1.2.5

The student knows that various forms of energy (e.g., mechanical, chemical, electrical, magnetic, nuclear, and radiant) can be measured in ways that make it possible to determine the amount of energy that is transformed.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. extends and refines use of a variety of tools to measure the gain or loss of energy.	**Student Handbook:** 291

Standard 2

The student understands the interaction of matter and energy.

Benchmark SC.B.2.2.2

The student recognizes the cost and risks to society and the environment posed by the use of nonrenewable energy.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. understands the reasons for energy conservation.	**Student Handbook:** 344-345

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
2. knows the risk factors associated with the use of nonrenewable energy sources (for example, economic factors and health factors).	**Student Handbook:** 320

Benchmark SC.B.2.2.3

The student knows that the limited supply of usable energy sources (e.g., fuels such as coal or oil) places great significance on the development of renewable energy sources.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. understands the processes that created fossil fuels and why they are nonrenewable.	**Student Handbook:** 322-323

Strand C: Force and Motion

Standard 1

The student understands that types of motion may be described, measured, and predicted.

Benchmark SC.C.1.2.1

The student understands that the motion of an object can be described and measured.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows that velocity describes a change in distance over time.	**Student Handbook:** 384

Benchmark SC.C.1.2.2

The student knows that waves travel at different speeds through different materials.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. understands that waves behave differently in different media (for example, water, a wall, the atmosphere, a vacuum).	**Student Handbook:** 308, 309, 315

Standard 2

The student understands that the types of force that act on an object and the effect of that force can be described, measured, and predicted.

Benchmark SC.C.2.2.1

The student recognizes that forces of gravity, magnetism, and electricity operate simple machines.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. understands how simple machines are used to make tasks possible.	**Student Handbook:** 280-283

Benchmark SC.C.2.2.2

The student knows that an object may move in a straight line at a constant speed, speed up, slow down, or change direction dependent on net force acting on the object.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. uses tools to measure changes in position, direction, and speed of an object after a push or pull has been applied.	**Student Handbook:** 42-43, 273, 276

Strand D: Processes that Shape the Earth

Standard 1

The student recognizes that processes in the lithosphere, atmosphere, hydrosphere, and biosphere interact to shape the Earth.

Benchmark SC.D.1.2.1

The student knows that larger rocks can be broken down into smaller rocks, which in turn can be broken down to combine with organic material to form soil.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. understands the stages of the rock cycle.	**Student Handbook:** 165
2. knows the properties of different types of soil.	**Student Handbook:** 169

Benchmark SC.D.1.2.3

The student knows that the water cycle is influenced by temperature, pressure, and the topography of the land.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. understands how the water cycle is influenced by temperature and land features.	**Student Handbook:** 158, 188

Benchmark SC.D.1.2.4

The student knows that the surface of the Earth is in a continuous state of change as waves, weather, and shifts of the land constantly change and produce many new features.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. understands how processes of weathering and erosion constantly change the surface of the Earth.	**Student Handbook:** 165, 172-173

Standard 2

The student understands the need for protection of the natural systems on Earth.

Benchmark SC.D.2.2.1

The student knows that reusing, recycling, and reducing the use of natural resources improve and protect the quality of life.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows ways in which people can conserve natural resources.	**Student Handbook:** 319, 344-345, 346-347
2. knows ways misuse of natural resources affects the quality of life for all species.	**Student Handbook:** 319, 361

Strand E: Earth and Space

Standard 1

The student understands the interaction and organization in the Solar System and the universe and how this affects life on Earth.

Benchmark SC.E.1.2.1

The student knows that the tilt of the Earth on its own axis as it rotates and revolves around the Sun causes changes in season, length of day, and energy available.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows that the tilt of the Earth causes the change of seasons, length of day, and the amount of energy available.	**Student Handbook:** 219, 220-221

Benchmark SC.E.1.2.2

The student knows that the combination of Earth's movement and the Moon's own orbit around the Earth results in the appearance of cyclical phases of the Moon.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. understands the cause of the phases of the Moon (for example, the movement patterns of the Earth and Moon relative to the Sun).	**Student Handbook:** 222-223

Benchmark SC.E.1.2.3

The student knows that the Sun is a star and that its energy can be captured or concentrated to generate heat and light for work on Earth.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows how the energy of the Sun can be captured as a source of heat and light on Earth (for example, plants, solar panels).	**Student Handbook:** 80, 324

Benchmark SC.E.1.2.4

The student knows that the planets differ in size, characteristics, and composition and that they orbit the Sun in our Solar System.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows characteristics of Jupiter, Saturn, Uranus, Neptune, and Pluto.	**Student Handbook:** 228, 231, 232, 233

Benchmark SC.E.1.2.5

The student understands the arrangement of planets in our Solar System.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows that gravity is one of the forces that keeps planets arranged in orbits around the Sun and the Moon in orbit around the Earth.	**Student Handbook:** 226-227, 270

Standard 2

The student recognizes the vastness of the universe and the Earth's place in it.

Benchmark SC.E.2.2.1

The student knows that, in addition to the Sun, there are many other stars that are far away.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. understands that the Sun is a medium-sized star located near the edge of a galaxy containing billions of other stars, which in turn is one of innumerable galaxies in the Universe.	**Student Handbook:** 226, 234, 235

Strand F: Processes of Life

Standard 1

The student describes patterns of structure and function in living things.

Benchmark SC.F.1.2.1

The student knows that the human body is made of systems with structures and functions that are related.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows that complex animals have specialized organs to carry out life processes.	**Student Handbook:** 106, 108, 109
2. knows the major organ systems of the human body.	**Student Handbook:** 110, 111
3. understands the functions of various body systems.	**Student Handbook:** 110, 111-125

Benchmark SC.F.1.2.4

The student knows that similar cells form different kinds of structures.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows that living things are composed of cells.	**Student Handbook:** 99, 100, 102, 104-105
2. knows that processes needed for life are carried out by the cells.	**Student Handbook:** 99, 104-105

Strand G: How Living Things Interact with Their Environment

Standard 1

The student understands the competitive, interdependent, cyclic nature of living things in the environment.

Benchmark SC.G.1.2.1

The student knows ways that plants, animals, and protists interact.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows how plants and animals interact with one another in an ecosystem (for example, organization of communities, flow of energy through food webs).	**Student Handbook:** 129, 130, 138

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
2. understands the relationship among organisms in aquatic and terrestrial food chains (for example, the role of producers, consumers, and decomposers).	**Student Handbook:** 133, 134, 136, 137, 138, 399

Benchmark SC.G.1.2.4

The student knows that some organisms decompose dead plants and animals into simple minerals and nutrients for use by living things and thereby recycle matter.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows organisms that act as decomposers.	**Student Handbook:** 136, 138, 145
2. understands the need for nutrients and minerals for living organisms.	**Student Handbook:** 76, 116
3. understands the process of decay (for example, the stages of decay, the organisms that help the decay process, the nonliving factors that influence the rate of decay, the products of decay).	**Student Handbook:** 136, 145

Benchmark SC.G.1.2.6

The student knows that organisms are growing, dying, and decaying and that new organisms are being produced from the materials of dead organisms.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows that organisms are growing, dying, and decaying and that new organisms are being produced.	**Student Handbook:** 82, 83, 98, 128, 185, 350

Benchmark SC.G.1.2.7

The student knows that variations in light, water, temperature, and soil content are largely responsible for the existence of different kinds of organisms and population densities in an ecosystem.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows that variations in light, water, temperature, and soil content are largely responsible for the existence of different kinds of organisms and population densities in an ecosystem.	**Student Handbook:** 133

Standard 2

The student understands the consequences of using limited natural resources.

Benchmark SC.G.2.2.1

The student knows that all living things must compete for Earth's limited resources; organisms best adapted to compete for the available resources will be successful and pass their adaptations (traits) to their offspring.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows the kinds of organisms that lived in the past and compares them to existing species.	**Student Handbook:** 185
2. knows characteristics that allow members within a species to survive and reproduce.	**Student Handbook:** 76, 77, 82, 84, 98

Benchmark SC.G.2.2.3

The student understands that changes in the habitat of an organism may be beneficial or harmful.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. understands patterns of interdependency in ecological systems.	**Student Handbook:** 126, 130, 133, 134-138
3. understands that changes in a ecological system usually affect the whole system.	**Student Handbook:** 350-351

Strand H: The Nature of Science

Standard 1

The student uses the scientific processes and habits of mind to solve problems.

Benchmark SC.H.1.2.1

The student knows that it is important to keep accurate records and descriptions to provide information and clues on causes of discrepancies in repeated experiments.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows that scientists make the results of their investigations public, and they describe the investigations in ways that enable others to repeat the investigation.	**Student Handbook:** 4, 13, 21-22

Benchmark SC.H.1.2.2

The student knows that a successful method to explore the natural world is to observe and record, and then analyze and communicate the results.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. plans and investigates experiments in which hypotheses are formulated based on cause and effect relationships; distinctions are made among observations, conclusions/inferences and predictions; a limited number of variables are controlled; and numerical data that are contradictory or unusual in experimental results are recognized.	**Student Handbook:** 2, 4, 5, 6-9, 10-14, 15-17, 18-20
2. uses metric tools to measure, record, and interpret data.	**Student Handbook:** 41, 42-43, 44-45, 46-48, 49

Benchmark SC.H.1.2.3

The student knows that to work collaboratively, all team members should be free to reach, explain, and justify their own individual conclusions.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. works collaboratively to collect, share, and record information for a scientific investigation.	**Student Handbook:** 21, 22, 23-25

Benchmark SC.H.1.2.4

The student knows that to compare and contrast observations and results is an essential skill in science.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows that comparisons between experiments can be made when conditions are the same.	**Student Handbook:** 12, 21

Standard 2

The student understands that most natural events occur in comprehensible, consistent patterns.

Benchmark SC.H.2.2.1

The student knows that natural events are often predictable and logical.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. makes predictions based on data from picture graphs, bar graphs, and line graphs.	**Student Handbook:** 16, 19, 66-69, 70-73
2. knows basic patterns, sequences, and cycles occurring in nature.	**Student Handbook:** 16, 84, 85, 86, 94

Standard 3

The student understands that science, technology, and society are interwoven and interdependent.

Benchmark SC.H.3.2.1

The student understands that people, alone or in groups, invent new tools to solve problems and do work that affects aspects of life outside of science.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows that technologies often have costs, as well as benefits, and can have an enormous effect on people and other living things.	**Student Handbook:** 355, 360, 361, 363
2. researches and reports on a science topic.	**Student Handbook:** 388, 389-393

Benchmark SC.H.3.2.2

The student knows that data are collected and interpreted in order to explain an event or concept.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. constructs and analyzes graphs, tables, maps, and charts to organize, examine, and evaluate information.	**Student Handbook:** 60-73, 403-407

Benchmark SC.H.3.2.3

The student knows that before a group of people build something or try something new, they should determine how it may affect other people.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. uses criteria to understand and analyze the impact of scientific discoveries (for example, determines whether or not scientific claims are backed by sufficient evidence and logical arguments).	**Student Handbook:** 368-369

Benchmark SC.H.3.2.4

The student knows that, through the use of science processes and knowledge, people can solve problems, make decisions, and form new ideas.

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5
The student: 1. knows ways that, through the use of science processes and knowledge, people can solve problems, make decisions, and form new ideas.	**Student Handbook:** 361, 364-365, 367

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Grade Level Expectations for the Sunshine State Standards
Grade 5

Strand A: The Nature of Matter

Standard 1

The student understands that all matter has observable, measurable properties.

Benchmark SC.A.1.2.1

The student determines that the properties of materials (e.g., density and volume) can be compared and measured (e.g., using rulers, balances, and thermometers).

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. uses metric tools to determine the density and volume of materials.	**Student Handbook:** 44-45, 244-245

Benchmark SC.A.1.2.2

The student knows that common materials (e.g., water) can be changed from one state to another by heating and cooling.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows that matter is conserved during heating and cooling.	**Student Handbook:** 260-267

Benchmark SC.A.1.2.4

The student knows that different materials are made by physically combining substances and that different objects can be made by combining different materials.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows that different materials can be physically combined to produce different substances.	**Student Handbook:** 256

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
2. knows the differences and similarities between mixtures and solutions.	**Student Handbook:** 258, 259

Benchmark SC.A.1.2.5

The student knows that materials made by chemically combining two or more substances may have properties that differ from the original materials.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows that materials made by chemically combining two or more substances have properties that differ from the original materials.	**Student Handbook:** 266-267
2. knows the difference between physical and chemical changes.	**Student Handbook:** 260-267

Standard 2

The student understands the basic principles of atomic theory.

Benchmark SC.A.2.2.1

The student knows that materials may be made of parts too small to be seen without magnification.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows that materials may be made of parts too small to be seen without magnification.	**Student Handbook:** 52

Strand B: Energy

Standard 1

The student recognizes that energy may be changed in form with varying efficiency.

Benchmark SC.B.1.2.1

The student knows how to trace the flow of energy in a system (e.g. as in an ecosystem).

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows how to trace the flow of energy in a system (for example, electricity in a circuit to produce heat, light, sound, or magnetic fields).	**Student Handbook:** 77-81, 301, 302-303, 306-307

Benchmark SC.B.1.2.2

The student recognizes various forms of energy (e.g., heat, light, and electricity).

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows that energy can be described as stored energy (potential) or energy of motion (kinetic).	**Student Handbook:** 285, 286, 325

Benchmark SC.B.1.2.5

The student knows that various forms of energy (e.g., mechanical, chemical, electrical, magnetic, nuclear, and radiant) can be measured in ways that make it possible to determine the amount of energy that is transformed.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. extends and refines use of a variety of tools to measure the gain or loss of energy.	**Student Handbook:** 291

Benchmark SC.B.1.2.6

The student knows ways that heat can move from one object to another.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows that some materials conduct heat better than others.	**Student Handbook:** 293

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
1. understands that convection, radiation, and conduction are methods of heat transfer.	**Student Handbook:** 292, 294

Standard 2

The student understands the interaction of matter and energy.

Benchmark SC.B.2.2.3

The student knows that the limited supply of usable energy sources (e.g., fuels such as coal or oil) places great significance on the development of renewable energy sources.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows that the limited supply of usable energy sources (for example, fuels such as coal or oil) places great significance on the development of renewable energy sources.	**Student Handbook:** 320, 321, 325, 326, 327, 328

Strand C: Force and Motion

Standard 1

The student understands that types of motion may be described, measured, and predicted.

Benchmark SC.C.1.2.1

The student understands that the motion of an object can be described and measured.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. uses scientific tools (for example, stopwatch, meter stick, compass) to measure speed, distance, and direction of an object.	**Student Handbook:** 41, 42-43, 50, 273

Benchmark SC.C.1.2.2

The student knows that waves travel at different speeds through different materials.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows that waves travel at different speeds through different materials.	**Student Handbook:** 308, 309, 315

Standard 2

The student understands that the types of force that act on an object and the effect of that force can be described, measured, and predicted.

Benchmark SC.C.2.2.1

The student recognizes that forces of gravity, magnetism, and electricity operate simple machines.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. understands the relationship between force and distance as it relates to simple machines (for example, levers and fulcrums working to lift objects).	**Student Handbook:** 282

Benchmark SC.C.2.2.2

The student knows that an object may move in a straight line at a constant speed, speed up, slow down, or change direction dependent on net force acting on the object.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows that objects do not change their motion unless acted upon by an outside force.	**Student Handbook:** 277, 278
2. understands how friction affects an object in motion.	**Student Handbook:** 274, 278

Benchmark SC.C.2.2.3

The student knows that the more massive an object is, the less effect a given force has.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows the relationship between the strength of a force and its effect on an object (for example, the greater the force, the greater the change in motion; the more massive the object, the smaller the effect of a given force).	**Student Handbook:** 278

Benchmark SC.C.2.2.4

The student knows that the motion of an object is determined by the overall effect of all the forces acting on the object.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows that motion in space is different from motion on Earth due to changes in gravitational force and friction.	**Student Handbook:** 227
2. understands how inertia, gravity, friction, mass, and force affect motion.	**Student Handbook:** 274, 278, 279

Strand D: Processes that Shape the Earth

Standard 1

The student recognizes that processes in the lithosphere, atmosphere, hydrosphere, and biosphere interact to shape the Earth.

Benchmark SC.D.1.2.1

The student knows that larger rocks can be broken down into smaller rocks, which in turn can be broken down to combine with organic material to form soil.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows that rocks are constantly being formed and worn away.	**Student Handbook:** 165, 166, 168

Benchmark SC.D.1.2.3

The student knows that the water cycle is influenced by temperature, pressure, and the topography of the land.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. understands how atmospheric pressure affects the water cycle.	**Student Handbook:** 158, 271

Benchmark SC.D.1.2.4

The student knows that the surface of the Earth is in a continuous state of change as waves, weather, and shifts of the land constantly change and produce many new features.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. understands how eroded materials are transported and deposited over time in new areas to form new features (for example, deltas, beaches, dunes).	**Student Handbook:** 172, 173
2. understands that geological features result from the movement of the crust of the Earth (for example, mountains, volcanic islands).	**Student Handbook:** 174-175, 197

Benchmark SC.D.1.2.5

The student knows that some changes in the Earth's surface are due to slow processes and some changes are due to rapid processes.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. understands how the surface of the Earth is shaped by both slow processes (for example, weathering, erosion, deposition) and rapid, cataclysmic events (for example, earthquakes, tsunamis, volcanoes).	**Student Handbook:** 165, 168, 171, 172-173, 176, 178, 180-182

Standard 2

The student understands the need for protection of the natural systems on Earth.

Benchmark SC.D.2.2.1

The student knows that reusing, recycling, and reducing the use of natural resources improve and protect the quality of life.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. extends and refines knowledge of ways people can reuse, recycle, and reduce the use of resources to improve and protect the quality of life.	**Student Handbook:** 344-349

Strand E: Earth and Space

Standard 1

The student understands the interaction and organization in the Solar System and the universe and how this affects life on Earth.

Benchmark SC.E.1.2.1

The student knows that the tilt of the Earth on its own axis as it rotates and revolves around the Sun causes changes in season, length of day, and energy available.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows that the orbit of the Earth is slightly elliptical and the Earth is closest to the Sun in the Northern Hemisphere in winter.	**Student Handbook:** 220-221
2. knows that the angle that the rays of the Sun strike the surface of the Earth determines the amount of energy received and thus the season of the year.	**Student Handbook:** 222-221
3. knows the effect of the tilt of the Earth on polar climates.	**Student Handbook:** 216

Benchmark SC.E.1.2.2

The student knows that the combination of Earth's movement and the Moon's own orbit around the Earth results in the appearance of cyclical phases of the Moon.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows the relative positions of the Moon, Earth, and Sun during each of the phases of the Moon.	**Student Handbook:** 222-223

Benchmark SC.E.1.2.4

The student knows that the planets differ in size, characteristics, and composition and that they orbit the Sun in our Solar System.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows that the planets differ in size, characteristics, and composition and that they orbit the Sun in our Solar System.	**Student Handbook:** 226, 227, 228-233

Benchmark SC.E.1.2.5

The student understands the arrangement of planets in our Solar System.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows the arrangement of the planets and the asteroid belt in our Solar System.	**Student Handbook:** 228-233

Strand F: Processes of Life

Standard 1

The student describes patterns of structure and function in living things.

Benchmark SC.F.1.2.1

The student knows that the human body is made of systems with structures and functions that are related.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. understands how body systems interact (for example, how bones and muscles work together for movement).	**Student Handbook:**113, 114-115

Benchmark SC.F.1.2.4

The student knows that similar cells form different kinds of structures.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. uses magnifying tools to identify similar cells and different kinds of structures.	**Student Handbook:** 51-53
2. knows the parts of plants and animal cells.	**Student Handbook:** 100, 101, 102, 103
3. understands how similar cells are organized to form structures (for example, tissue, organs) in plants and animals.	**Student Handbook:** 104, 105, 106, 107

Standard 2

The student understands the process and importance of genetic diversity.

Benchmark SC.F.2.2.1

The student knows that many characteristics of an organism are inherited from the parents of the organism, but that other characteristics are learned from an individual's interactions with the environment.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows that many characteristics of an organism are inherited from the genetic ancestors of the organism (for example, eye color, flower color).	**Student Handbook:** 82, 84, 128

Strand G: How Living Things Interact with Their Environment

Standard 1

The student understands the competitive, interdependent, cyclic nature of living things in the environment.

Benchmark SC.G.1.2.1

The student knows ways that plants, animals, and protists interact.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. understands the various roles of single-celled organisms in the environment.	**Student Handbook:** 99, 133, 140, 144, 145, 361
2. knows ways in which protists interact with plants and animals in the environment.	**Student Handbook:** 140, 144

Benchmark SC.G.1.2.2

The student knows living things compete in a climatic region with other living things and that structural adaptations make them fit for an environment.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. understands how changes in the environment affect organisms (for example, some organisms move in, others move out; some organisms survive and reproduce, others die).	**Student Handbook:** 91, 93, 94, 127

Benchmark SC.G.1.2.3

The student knows that green plants use carbon dioxide, water, and sunlight energy to turn minerals and nutrients into food for growth, maintenance, and reproduction.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows that green plants use carbon dioxide, water, and sunlight energy to turn minerals and nutrients into food for growth, maintenance, and reproduction.	**Student Handbook:** 80, 81

Standard 2

The student understands the consequences of using limited natural resources.

Benchmark SC.G.2.2.1

The student knows that all living things must compete for Earth's limited resources; organisms best adapted to compete for the available resources will be successful and pass their adaptations (traits) to their offspring.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows that adaptations to their environment may increase the survival of a species.	**Student Handbook:** 127, 353

Strand H: The Nature of Science

Standard 1

The student uses the scientific processes and habits of mind to solve problems.

Benchmark SC.H.1.2.1

The student knows that it is important to keep accurate records and descriptions to provide information and clues on causes of discrepancies in repeated experiments.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. understands that although the same scientific investigation may give slightly different results when it is carried out by different persons or at different times or places, the general evidence collected from the investigation should be replicable by others.	**Student Handbook:** 4, 13, 21-22

Benchmark SC.H.1.2.2

The student knows that a successful method to explore the natural world is to observe and record, and then analyze and communicate the results.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. understands that scientists use different kinds of investigations (for example, observations of events in nature, controlled experiments) depending on the questions they are trying to answer.	**Student Handbook:** 5
2. understands the importance of accuracy in conducting measurements, and uses estimation when exact measurements are not possible.	**Student Handbook:** 15, 40

Benchmark SC.H.1.2.3

The student knows that to work collaboratively, all team members should be free to reach, explain, and justify their own individual conclusions.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. understands the importance of communication among scientists (for example, informing and becoming informed about scientific investigations in progress and the work of others; exposing ideas to the criticism of others).	**Student Handbook:** 21, 367

Benchmark SC.H.1.2.4

The student knows that to compare and contrast observations and results is an essential skill in science.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. uses strategies to review, compare and contrast, and critique scientific investigations.	**Student Handbook:** 12, 21
2. knows that an experiment must be repeated many times and yield consistent results before the results are accepted.	**Student Handbook:** 12

Benchmark SC.H.1.2.5

The student knows that a model of something is different from the real thing, but can be used to learn something about the real thing.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. uses sketches and diagrams to propose scientific solutions to problems.	**Student Handbook:** 23, 24, 25

Standard 2

The student understands that most natural events occur in comprehensible, consistent patterns.

Benchmark SC.H.2.2.1

The student knows that natural events are often predictable and logical.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. makes a prediction for a new investigation using the data from a previous investigation.	**Student Handbook:** 19
2. understands that change is constantly occurring and uses strategies to analyze different patterns of change.	**Student Handbook:** 16

Standard 3

The student understands that science, technology, and society are interwoven and interdependent.

Benchmark SC.H.3.2.1

The student understands that people, alone or in groups, invent new tools to solve problems and do work that affects aspects of life outside of science.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. knows areas in which technology has improved human lives (for example, transportation, communication, nutrition, sanitation, health care, entertainment).	**Student Handbook:** 355, 360, 361, 362
2. knows that new inventions often lead to other new inventions and ways of doing things.	**Student Handbook:** 362

Benchmark SC.H.3.2.2

The student knows that data are collected and interpreted in order to explain an event or concept.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. selects appropriate graphical representations (for example, graphs, charts, diagrams) to collect, record, and report data.	**Student Handbook:** 61, 62, 63, 66-67, 68-69, 70-71

Benchmark SC.H.3.2.3

The student knows that before a group of people build something or try something new, they should determine how it may affect other people.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. understands how a solution to one scientific problem can create another problem.	**Student Handbook:** 363

Benchmark SC.H.3.2.4

The student knows that, through the use of science processes and knowledge, people can solve problems, make decisions, and form new ideas.

Grade Level Expectations, Grade 5	ScienceSaurus, Grades 4-5
The student: 1. extends and refines knowledge of ways that, through the use of science processes and knowledge, people can solve problems, make decisions, and form new ideas.	**Student Handbook:** 356-363

2. knows the process used to determine the age of a star.	**Student Handbook:** 245