

High School Grades (9-12)

SSS - Essential Work Skills Crosswalk - Science

Science Standard	SC.A	Science SSS/Benchmark	1.4.1	FCAT Concept	M
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Description *Knows that the electron configuration in atoms determines how a substance reacts and how much energy is involved in its reactions.*

Essential Skill **Essential Skill Description**

s78 Understand the historical development of the periodic table and apply the principles inherent in its development, including the properties and atomic structure of elements and resultant chemical compounds, the forces acting between and among atoms and molecules, and changes in substances as a result of chemical combination.

Science Standard	SC.A	Science SSS/Benchmark	1.4.2	FCAT Concept	M
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Description *Knows that the vast diversity of the properties of materials is primarily due to variations in the forces that hold molecules together.*

Essential Skill **Essential Skill Description**

s78 Understand the historical development of the periodic table and apply the principles inherent in its development, including the properties and atomic structure of elements and resultant chemical compounds, the forces acting between and among atoms and molecules, and changes in substances as a result of chemical combination.

Science Standard	SC.A	Science SSS/Benchmark	1.4.3	FCAT Concept	M
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Description *Knows that a change from one phase of matter to another involves a gain or loss of energy.*

Essential Skill **Essential Skill Description**

s57 Understand physical/chemical change (e.g., change of phase between gases, liquids, and solids).

Science Standard	SC.A	Science SSS/Benchmark	1.4.4	FCAT Concept	H
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Description *Experiments and determines that the rates of reaction among atoms and molecules depend on the concentration, pressure, and temperature of the reactants and the presence or absence of catalysts.*

Essential Skill **Essential Skill Description**

No Essential Work Skill

Science Standard	SC.A	Science SSS/Benchmark	1.4.5	FCAT Concept	M
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Description *Knows that connections (bonds) form between substances when outer-shell electrons are either transferred or shared between their atoms, changing the properties of substances.*

Essential Skill **Essential Skill Description**

s78 Understand the historical development of the periodic table and apply the principles inherent in its development, including the properties and atomic structure of elements and resultant chemical compounds, the forces acting between and among atoms and molecules, and changes in substances as a result of chemical combination.

Science Standard	SC.A	Science SSS/Benchmark	2.4.1	FCAT Concept	M
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Description *Knows that the number and configuration of electrons will equal the number of protons in an electrically neutral atom and when an atom gains or loses electrons, the charge is unbalanced.*

Essential Skill **Essential Skill Description**

s78 Understand the historical development of the periodic table and apply the principles inherent in its development, including the properties and atomic structure of elements and resultant chemical compounds, the forces acting between and among atoms and molecules, and changes in substances as a result of chemical combination.

Science Standard	SC.A	Science SSS/Benchmark	2.4.2	FCAT Concept	M
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Description *Knows the difference between an element, a molecule, and a compound.*

Essential Skill **Essential Skill Description**

s78 Understand the historical development of the periodic table and apply the principles inherent in its development, including the properties and atomic structure of elements and resultant chemical compounds, the forces acting between and among atoms and molecules, and changes in substances as a result of chemical combination.

Science Standard	SC.A	Science SSS/Benchmark	2.4.3	FCAT Concept	M
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Description *Knows that a number of elements have heavier, unstable nuclei that decay, spontaneously giving off smaller particles and waves that result in a small loss of mass and release a large amount of energy.*

Essential Skill **Essential Skill Description**

s75 Understand nuclear energy involves a reaction where mass is converted to energy.

Science Standard	SC.A	Science SSS/Benchmark	2.4.4	FCAT Concept	M
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Description *Knows that nuclear energy is released when small, light atoms are fused into heavier ones.*

Essential Skill **Essential Skill Description**

s105 Understand that fusion is the process of combining two light nuclei to form a heavier one, wherein the energy is far greater than in a fission reaction.

Science Standard	SC.A	Science SSS/Benchmark	2.4.5	FCAT Concept	H
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Description *Knows that elements are arranged into groups and families based on similarities in electron structure and that their physical and chemical properties can be predicted.*

Essential Skill **Essential Skill Description**

s78 Understand the historical development of the periodic table and apply the principles inherent in its development, including the properties and atomic structure of elements and resultant chemical compounds, the forces acting between and among atoms and molecules, and changes in substances as a result of chemical combination.

Science Standard	SC.A	Science SSS/Benchmark	2.4.6	FCAT Concept	M
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Description *Understands that matter may act as a wave, a particle, or something else entirely different with its own characteristic behavior.*

Essential Skill **Essential Skill Description**

s106 Know that quantum theory was developed to explain phenomena that could not be explained by the classical theory of light. Examine the quantum and photon.

Science Standard	SC.B	Science SSS/Benchmark	1.4.1	FCAT Concept	H
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Description *Understands how knowledge of energy is fundamental to all the scientific disciplines (e.g., the energy required for biological processes in living organisms and the energy required for the building, erosion, and rebuilding of the Earth).*

Essential Skill **Essential Skill Description**

s25 Know the properties of electromagnetic energy (energy radiated from all objects not at a temperature of absolute zero), solar energy (energy from the sun), and earth energy (energy released from the decay of radioactive matter). Understand that weather and climate involve energy transfer in and out of the atmosphere by means of conduction, convection, and radiation.

s55 Identify types of energy (e.g., heat, light, and electricity) and know how to apply measurements of energy (e.g., the calorie, and thermometry).

Science Standard	<i>SC.B</i>	Science SSS/Benchmark	<i>1.4.2</i>	FCAT Concept	M
Description	<i>Understands that there is conservation of mass and energy when matter is transformed.</i>				
Essential Skill	Essential Skill Description				
s57	Understand physical/chemical change (e.g., change of phase between gases, liquids, and solids).				

Science Standard	<i>SC.B</i>	Science SSS/Benchmark	<i>1.4.3</i>	FCAT Concept	M
Description	<i>Knows that temperature is a measure of the average translational kinetic energy of motion of the molecules in an object.</i>				
Essential Skill	Essential Skill Description				
s94	Understand the concept of internal energy (the total potential and kinetic energies associated with the motion and relative position of the molecules of an object) and heat (the energy transfer from a warm body to a cold body).				

Science Standard	<i>SC.B</i>	Science SSS/Benchmark	<i>1.4.4</i>	FCAT Concept	M
Description	<i>Knows that as electrical charges oscillate, they create time-varying electric and magnetic fields that propagate away from the source as an electromagnetic wave</i>				
Essential Skill	Essential Skill Description				
s93	Know the concepts and theories of waves (i.e., a vibratory disturbance that propagates through a material or space, and how energy transfer, pulses and periodic waves, and wave motion in incorporated).				

Science Standard	<i>SC.B</i>	Science SSS/Benchmark	<i>1.4.5</i>	FCAT Concept	H
Description	<i>Knows that each source of energy presents advantages and disadvantages to its use in society (e.g., political and economic implications may determine a society's selection of renewable or nonrenewable energy sources).</i>				
Essential Skill	Essential Skill Description				
s60	Observe and interpret energy and change relationships with the understanding that change occurs simultaneously at the interface between two parts of the environment where there is an energy exchange.				

Science Standard *SC.B* **Science SSS/Benchmark** *1.4.6* **FCAT Concept** *M*

Description *Knows that the first law of thermodynamics relates the transfer of energy to the work done and the heat transferred.*

Essential Skill **Essential Skill Description**

s60 Observe and interpret energy and change relationships with the understanding that change occurs simultaneously at the interface between two parts of the environment where there is an energy exchange.

Science Standard *SC.B* **Science SSS/Benchmark** *1.4.7* **FCAT Concept** *M*

Description *Knows that the total amount of usable energy always decreases, even though the total amount of energy is conserved in any transfer..*

Essential Skill **Essential Skill Description**

s55 Identify types of energy (e.g., heat, light, and electricity) and know how to apply measurements of energy (e.g., the calorie, and thermometry).

Science Standard *SC.B* **Science SSS/Benchmark** *2.4.1* **FCAT Concept** *M*

Description *Knows that the structure of the universe is the result of interactions involving fundamental particles (matter) and basic forces (energy) and that evidence suggests that the universe contains all of the matter and energy that ever existed.*

Essential Skill **Essential Skill Description**

No Essential Work Skill

Science Standard *SC.C* **Science SSS/Benchmark** *1.4.1* **FCAT Concept** *M*

Description *Knows that all motion is relative to whatever frame of reference is chosen and that there is no absolute frame of reference from which to observe all motion.*

Essential Skill **Essential Skill Description**

s77 Understand and apply kinematics (i.e., the mathematical methods of describing motion without regard to the forces that produce it, such as velocity, acceleration and deceleration, and displacement).

Science Standard *SC.C* **Science SSS/Benchmark** *1.4.2* **FCAT Concept** *M*

Description *Knows that any change in velocity is an acceleration.*

Essential Skill **Essential Skill Description**

s84 Understand and apply statics (i.e., the relation between forces acting on an object at rest) and dynamics (i.e., the relation between the forces acting on an object and the resulting motion).

Science Standard	SC.C	Science SSS/Benchmark	2.4.1	FCAT Concept	H
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Description *Knows that acceleration due to gravitational force is proportional to mass and inversely proportional to the square of the distance between the objects.*

Essential Skill **Essential Skill Description**

s84 Understand and apply statics (i.e., the relation between forces acting on an object at rest) and dynamics (i.e., the relation between the forces acting on an object and the resulting motion).

Science Standard	SC.C	Science SSS/Benchmark	2.4.2	FCAT Concept	M
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Description *Knows that electrical forces exist between any two charged objects.*

Essential Skill **Essential Skill Description**

No Essential Work Skill

Science Standard	SC.C	Science SSS/Benchmark	2.4.3	FCAT Concept	M
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Description *Describes how magnetic force and electrical force are two aspects of a single force.*

Essential Skill **Essential Skill Description**

s74 Understand the concepts of magnetic forces and magnetic fields.

Science Standard	SC.C	Science SSS/Benchmark	2.4.4	FCAT Concept	M
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Description *Knows that the forces that hold the nucleus of an atom together are much stronger than electromagnetic force and that this is the reason for the great amount of energy released from the nuclear reactions in the sun and other stars.*

Essential Skill **Essential Skill Description**

No Essential Work Skill

Science Standard	SC.C	Science SSS/Benchmark	2.4.5	FCAT Concept	M
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Description *Knows that most observable forces can be traced to electric forces acting between atoms or molecules.*

Essential Skill **Essential Skill Description**

No Essential Work Skill

Science Standard SC.C **Science SSS/Benchmark** 2.4.6 **FCAT Concept** M

Description *Explains that all forces come in pairs commonly called action and reaction.*

Essential Skill **Essential Skill Description**

s84 Understand and apply statics (i.e., the relation between forces acting on an object at rest) and dynamics (i.e., the relation between the forces acting on an object and the resulting motion).

Science Standard SC.D **Science SSS/Benchmark** 1.4.1 **FCAT Concept** H

Description *Knows how climatic patterns on Earth result from an interplay of many factors (Earth's topography, its rotation on its axis, solar radiation, the transfer of heat energy where the atmosphere interfaces with lands and oceans, and wind and ocean currents).*

Essential Skill **Essential Skill Description**

s01 Understand how and why the rotation and revolution of the earth around the sun affects the length of night and day, the changing of seasons, and weather patterns.

s25 Know the properties of electromagnetic energy (energy radiated from all objects not at a temperature of absolute zero), solar energy (energy from the sun), and earth energy (energy released from the decay of radioactive matter). Understand that weather and climate involve energy transfer in and out of the atmosphere by means of conduction, convection, and radiation.

s48 Predict weather as a probability of occurrence by examining the factors that produce change in atmospheric variables.

Science Standard SC.D **Science SSS/Benchmark** 1.4.2 **FCAT Concept** H

Description *Knows that the solid crust of Earth consists of slow-moving, separate plates that float on a denser, molten layer of Earth and that these plates interact with each other, changing the Earth's surface in many ways (e.g., forming mountain ranges and rift valleys, causing earthquake and volcanic activity, and forming undersea mountains that can become ocean islands).*

Essential Skill **Essential Skill Description**

s32 Understand earthquakes by examining the different types of seismic waves, wave velocities, how waves are transmitted through solids and/or fluids, and how to locate an epicenter by analyzing the travel times of seismic waves.

s64 Examine evidence of crustal movement by identifying minor changes in the earth's crust (e.g., deformed rock strata, displaced fossils, and displaced strata), and major changes in the earth's crust (e.g., zones of frequent crustal activity, geosynclines, vertical movements, ocean floor spreading, and continental drift).

s71 Analyze the properties of the earth's crust and interior (i.e., solid and liquid zones, crustal thickness, crustal composition, density, temperature and pressure, and interior composition).

Science Standard *SC.D* **Science SSS/Benchmark** *1.4.3* **FCAT Concept** *M*

Description *Knows that changes in Earth's climate, geological activity, and life forms may be traced and compared.*

Essential Skill **Essential Skill Description**

- s65 Sequence geologic events by analyzing the chronology of layers, igneous intrusions and extrusions, faults, joints and folds, and internal characteristics such as cracks, veins, and mineral cement.
- s67 Examine the fossil record to understand ancient life forms and evolutionary development.

Science Standard *SC.D* **Science SSS/Benchmark** *1.4.4* **FCAT Concept** *H*

Description *Knows that Earth's systems and organisms are the result of a long, continuous change over time.*

Essential Skill **Essential Skill Description**

- s102 Determine geologic history by examining the rock record.
- s67 Examine the fossil record to understand ancient life forms and evolutionary development.

Science Standard *SC.D* **Science SSS/Benchmark** *2.4.1* **FCAT Concept** *H*

Description *Understands the interconnectedness of the systems on Earth and the quality of life.*

Essential Skill **Essential Skill Description**

- s13 Understand ecology as the study of the interactions and relationships of organisms with their living and nonliving environments (i.e., the ecosystem, communities, and populations).

Science Standard *SC.E* **Science SSS/Benchmark** *1.4.1* **FCAT Concept** *H*

Description *Understands the relationships between events on Earth and the movements of the Earth, its moon, the other planets, and the sun.*

Essential Skill **Essential Skill Description**

- s01 Understand how and why the rotation and revolution of the earth around the sun affects the length of night and day, the changing of seasons, and weather patterns.
- s50 Identify and comprehend celestial observations (i.e., motions of objects in the sky) such as star paths, planetary motions, satellite motions, and sun motions.

Science Standard	SC.E	Science SSS/Benchmark	1.4.2	FCAT Concept	H
Description	<i>Knows how the characteristics of other planets and satellites are similar to and different from those of the Earth.</i>				
Essential Skill	Essential Skill Description				
s50	Identify and comprehend celestial observations (i.e., motions of objects in the sky) such as star paths, planetary motions, satellite motions, and sun motions.				

Science Standard	SC.E	Science SSS/Benchmark	1.4.3	FCAT Concept	H
Description	<i>Knows the various reasons that Earth is the only planet in our Solar System that appears to be capable of supporting life as we know it.</i>				
Essential Skill	Essential Skill Description				
s40	Know the survival requirements of animals and plants and the history and implications of population growth.				

Science Standard	SC.E	Science SSS/Benchmark	2.4.1	FCAT Concept	M
Description	<i>Knows that the stages in the development of three categories of stars are based on mass: stars that have the approximate mass of our sun, stars that are two- to three- stellar masses and develop into neutron stars, and stars that are five- to six stellar masses and develop into black holes.</i>				
Essential Skill	Essential Skill Description				
	No Essential Work Skill				

Science Standard	SC.E	Science SSS/Benchmark	2.4.2	FCAT Concept	M
Description	<i>Identifies the arrangement of bodies found within and outside our galaxy.</i>				
Essential Skill	Essential Skill Description				
s50	Identify and comprehend celestial observations (i.e., motions of objects in the sky) such as star paths, planetary motions, satellite motions, and sun motions.				

Science Standard	SC.E	Science SSS/Benchmark	2.4.3	FCAT Concept	M
Description	<i>Knows astronomical distance and time.</i>				
Essential Skill	Essential Skill Description				
s23	Measure properties of the environment using dimensional quantities such as time, length, mass, pressure, volume, acceleration, etc. Compare, estimate and predict measurements.				

Science Standard *SC.E* **Science SSS/Benchmark** *2.4.4* **FCAT Concept** L

Description *Understand stellar equilibrium.*

Essential Skill **Essential Skill Description**

s50 Identify and comprehend celestial observations (i.e., motions of objects in the sky) such as star paths, planetary motions, satellite motions, and sun motions.

Science Standard *SC.E* **Science SSS/Benchmark** *2.4.5* **FCAT Concept** L

Description *Knows various scientific theories on how the universe was formed.*

Essential Skill **Essential Skill Description**

No Essential Work Skill

Science Standard *SC.E* **Science SSS/Benchmark** *2.4.6* **FCAT Concept** H

Description *Knows the various ways in which scientists collect and generate data about our universe (e.g., X-ray telescopes, computer simulations of gravitational systems, nuclear reactions, space probes, and supercollider simulations).*

Essential Skill **Essential Skill Description**

No Essential Work Skill

Science Standard *SC.E* **Science SSS/Benchmark** *2.4.7* **FCAT Concept** H

Description *Knows that mathematical models and computer simulations are used in studying evidence from many sources to form a scientific account of the universe.*

Essential Skill **Essential Skill Description**

s115 (Not Ranked) Plan and apply real or hypothetical models and constructions to facilitate investigation and learning and the solution to practical problems.

Science Standard *SC.F* **Science SSS/Benchmark** *1.4.1* **FCAT Concept** H

Description *Knows that the body processes involve specific biochemical reactions governed by biochemical principles.*

Essential Skill **Essential Skill Description**

s42 Understand the chemical reactions involved in cell functions (e.g., food molecules taken into cells are broken down to provide the chemical constituents needed to synthesize other molecules).

Science Standard *SC.F* **Science SSS/Benchmark** *1.4.2* **FCAT Concept** H

Description *Knows that body structures are uniquely designed and adapted for their function.*

Essential Skill **Essential Skill Description**

s02 Identify and understand the structure and parts that comprise the systems (i.e., cardiovascular, nervous, lymphatic, muscular, etc.) and regions (i.e., head and neck, upper limb, thorax, abdominopelvic, back, and lower limb) of the human body.

Science Standard *SC.F* **Science SSS/Benchmark** *1.4.3* **FCAT Concept** H

Description *Knows that membranes are sites for chemical synthesis and essential energy conversions.*

Essential Skill **Essential Skill Description**

s42 Understand the chemical reactions involved in cell functions (e.g., food molecules taken into cells are broken down to provide the chemical constituents needed to synthesize other molecules).

Science Standard *SC.F* **Science SSS/Benchmark** *1.4.4* **FCAT Concept** M

Description *Understands that biological systems obey the same laws of conservation as physical systems.*

Essential Skill **Essential Skill Description**

s42 Understand the chemical reactions involved in cell functions (e.g., food molecules taken into cells are broken down to provide the chemical constituents needed to synthesize other molecules).

Science Standard *SC.F* **Science SSS/Benchmark** *1.4.5* **FCAT Concept** H

Description *Knows that complex interactions among the different kinds of molecules in the cell cause distinct cycles of activity governed by proteins.*

Essential Skill **Essential Skill Description**

s42 Understand the chemical reactions involved in cell functions (e.g., food molecules taken into cells are broken down to provide the chemical constituents needed to synthesize other molecules).

Science Standard *SC.F* **Science SSS/Benchmark** *1.4.6* **FCAT Concept** M

Description *Knows that separate parts of the body communicate with each other using electrical and/or chemical signals.*

Essential Skill **Essential Skill Description**

s45 Understand nerve regulation - the nervous system and related disorders such as cerebral palsy, meningitis, and polio; and chemical regulation - the endocrine system, hormones and related disorders such as goiter and diabetes.

Science Standard *SC.F* **Science SSS/Benchmark** *1.4.7* **FCAT Concept** M

Description *Knows that organisms respond to internal and external stimuli.*

Essential Skill **Essential Skill Description**

s45 Understand nerve regulation - the nervous system and related disorders such as cerebral palsy, meningitis, and polio; and chemical regulation - the endocrine system, hormones and related disorders such as goiter and diabetes.

Science Standard *SC.F* **Science SSS/Benchmark** *1.4.8* **FCAT Concept** M

Description *Knows that cell behavior can be affected by molecules from other parts of the organism or even from other organisms.*

Essential Skill **Essential Skill Description**

s42 Understand the chemical reactions involved in cell functions (e.g., food molecules taken into cells are broken down to provide the chemical constituents needed to synthesize other molecules).

Science Standard *SC.F* **Science SSS/Benchmark** *2.4.1* **FCAT Concept** M

Description *Understands the mechanisms of asexual and sexual reproduction and knows the different genetic advantages and disadvantages of asexual and sexual reproduction.*

Essential Skill **Essential Skill Description**

s14 Understand that sexual reproduction involves the union of special sex cells that are usually produced by two separate parents with half of the genes coming from each parent allowing for a high degree of genetic diversity. Most plants and animals use sexual reproduction.

s63 Understand that asexual reproduction involves the production of offspring from a single parent organism with all the genes coming from that parent. Asexual reproduction occurs with unicellular organisms and some plants.

Science Standard *SC.F* **Science SSS/Benchmark** *2.4.2* **FCAT Concept** M

Description *Knows that every cell contains a "blueprint" coded in DNA molecules that specify how proteins are assembled to regulate cells.*

Essential Skill **Essential Skill Description**

s56 Know the chemical and structural properties of DNA and its role in specifying the genetic characteristics of an organism.

Science Standard *SC.F* **Science SSS/Benchmark** *2.4.3* **FCAT Concept** *H*

Description *Understands the mechanisms of change (e.g., mutation and natural selection) that lead to adaptations in a species and their ability to survive naturally in changing conditions and to increase species diversity.*

Essential Skill **Essential Skill Description**
s44 Examine evolution as it relates to theories concerning the origin of life and natural selection.

Science Standard *SC.G* **Science SSS/Benchmark** *1.4.1* **FCAT Concept** *H*

Description *Knows of the great diversity and interdependence of living things.*

Essential Skill **Essential Skill Description**
s13 Understand ecology as the study of the interactions and relationships of organisms with their living and nonliving environments (i.e., the ecosystem, communities, and populations).

Science Standard *SC.G* **Science SSS/Benchmark** *1.4.2* **FCAT Concept** *H*

Description *Understands how the flow of energy through an ecosystem made up of producers, consumers, and decomposers carries out the processes of life and that some energy dissipates as heat and is not recycled.*

Essential Skill **Essential Skill Description**
s13 Understand ecology as the study of the interactions and relationships of organisms with their living and nonliving environments (i.e., the ecosystem, communities, and populations).

Science Standard *SC.G* **Science SSS/Benchmark** *1.4.3* **FCAT Concept** *M*

Description *Knows that the chemical elements that make up the molecules of living things are combined and recombined in different ways.*

Essential Skill **Essential Skill Description**
s99 Understand and apply organic reactions involving substitution, addition, fermentation, oxidation, polymerization, etc.

Science Standard	SC.G	Science SSS/Benchmark	2.4.1	FCAT Concept	M
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Description *Knows that layers of energy-rich organic materials have been gradually turned into great coal beds and oil pools (fossil fuels) by the pressure of the overlying earth and that humans burn fossil fuels to release the stored energy as heat and carbon dioxide.*

Essential Skill **Essential Skill Description**

- s71 Analyze the properties of the earth's crust and interior (i.e., solid and liquid zones, crustal thickness, crustal composition, density, temperature and pressure, and interior composition).
 - s89 Identify the factors affecting the deposition of particles (e.g., size, shape, density, and velocity) and analyze the sorting of sediments in a system.
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Science Standard	SC.G	Science SSS/Benchmark	2.4.2	FCAT Concept	H
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Description *Knows that changes in a component of an ecosystem will have unpredictable effects on the entire system but that the components of the system tend to react in a way that will restore the ecosystem to its original condition.*

Essential Skill **Essential Skill Description**

- s13 Understand ecology as the study of the interactions and relationships of organisms with their living and nonliving environments (i.e., the ecosystem, communities, and populations).
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Science Standard	SC.G	Science SSS/Benchmark	2.4.3	FCAT Concept	M
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Description *Understands how genetic variation of offspring contributes to population control in an environment and that natural selection ensures that those who are best adapted to their surroundings survive to reproduce.*

Essential Skill **Essential Skill Description**

- s13 Understand ecology as the study of the interactions and relationships of organisms with their living and nonliving environments (i.e., the ecosystem, communities, and populations).
 - s44 Examine evolution as it relates to theories concerning the origin of life and natural selection.
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Science Standard	SC.G	Science SSS/Benchmark	2.4.4	FCAT Concept	H
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Description *Knows that the world ecosystems are shaped by physical factors that limit their productivity.*

Essential Skill **Essential Skill Description**

- s13 Understand ecology as the study of the interactions and relationships of organisms with their living and nonliving environments (i.e., the ecosystem, communities, and populations).
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Science Standard	SC.G	Science SSS/Benchmark	2.4.5	FCAT Concept	H
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Description *Understands that the amount of life any environment can support is limited and that human activities can change the flow of energy and reduce the fertility of the Earth.*

Essential Skill **Essential Skill Description**

s10 Understand the human impact on the environment through pollution (air, water, and soil), and ways to improve it through education, research, laws, and conservation.

Science Standard	SC.G	Science SSS/Benchmark	2.4.6	FCAT Concept	M
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Description *Knows the ways in which humans today are placing their environmental support systems at risk (e.g., rapid human population growth, environmental degradation, and resource depletion).*

Essential Skill **Essential Skill Description**

s40 Know the survival requirements of animals and plants and the history and implications of population growth.

Science Standard	SC.H	Science SSS/Benchmark	1.4.1	FCAT Concept	H
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Description *Knows that investigations are conducted to explore new phenomena, to check on previous results, to test how well a theory predicts, and to compare different theories.*

Essential Skill **Essential Skill Description**

s114 (Not Ranked) Know and apply the principles of scientific inquiry. (Implicit in this statement are the processes of prediction, estimation, developing hypotheses, drawing conclusions, evaluation, and following ethical principles and professional procedures.)

Science Standard	SC.H	Science SSS/Benchmark	1.4.2	FCAT Concept	M
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Description *Knows that from time to time, major shifts occur in the scientific view of how the world works, but that more often the changes that take place in the body of scientific knowledge are small modifications of prior knowledge.*

Essential Skill **Essential Skill Description**

s116 (Not Ranked) Understand the impact upon society and the environment of scientific and technological discoveries and the contributions of scientists. Understand how society may accept or reject scientific discoveries based upon need or refusal to change.

Science Standard	SC.H	Science SSS/Benchmark	1.4.3	FCAT Concept	M
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Description *Understands that no matter how well one theory fits observations, a new theory might fit them as well or better, or might fit a wider range of observations, because in science, the testing, revising, and occasional discarding of theories, new and old, never ends and leads to an increasingly better understanding of how things work in the world, but not to absolute truth.*

Essential Skill **Essential Skill Description**

s114 (Not Ranked) Know and apply the principles of scientific inquiry. (Implicit in this statement are the processes of prediction, estimation, developing hypotheses, drawing conclusions, evaluation, and following ethical principles and professional procedures.)

Science Standard	SC.H	Science SSS/Benchmark	1.4.4	FCAT Concept	M
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Description *Knows that scientists in any one research group tend to see things alike and that therefore scientific teams are expected to seek out the possible sources of bias in the design of their investigations and in their data analysis.*

Essential Skill **Essential Skill Description**

s114 (Not Ranked) Know and apply the principles of scientific inquiry. (Implicit in this statement are the processes of prediction, estimation, developing hypotheses, drawing conclusions, evaluation, and following ethical principles and professional procedures.)

Science Standard	SC.H	Science SSS/Benchmark	1.4.5	FCAT Concept	M
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Description *Understands that new ideas in science are limited by the context in which they are conceived, are often rejected by the scientific establishment, sometimes spring from unexpected findings, and usually grow slowly from many contributors.*

Essential Skill **Essential Skill Description**

s116 (Not Ranked) Understand the impact upon society and the environment of scientific and technological discoveries and the contributions of scientists. Understand how society may accept or reject scientific discoveries based upon need or refusal to change.

Science Standard	SC.H	Science SSS/Benchmark	1.4.6	FCAT Concept	M
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Description *Understands that in the short run, new ideas that do not mesh well with mainstream ideas in science often encounter vigorous criticism and that in the long run, theories are judged by how they fit with other theories, the range of observations they explain, how well they explain observations, and how effective they are in predicting new findings.*

Essential Skill **Essential Skill Description**

s116 (Not Ranked) Understand the impact upon society and the environment of scientific and technological discoveries and the contributions of scientists. Understand how society may accept or reject scientific discoveries based upon need or refusal to change.

Science Standard	SC.H	Science SSS/Benchmark	1.4.7	FCAT Concept	M
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Description *Understands the importance of a sense of responsibility, a commitment to peer review, truthful reporting of the methods and outcomes of investigations, and making the public aware of the findings.*

Essential Skill **Essential Skill Description**

s114 (Not Ranked) Know and apply the principles of scientific inquiry. (Implicit in this statement are the processes of prediction, estimation, developing hypotheses, drawing conclusions, evaluation, and following ethical principles and professional procedures.)

Science Standard	SC.H	Science SSS/Benchmark	2.4.1	FCAT Concept	H
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Description *Knows that scientists assume that the universe is a vast system in which basic rules exist that may range from very simple to extremely complex, but that scientists operate on the belief that the rules can be discovered by careful, systemic study.*

Essential Skill **Essential Skill Description**

s114 (Not Ranked) Know and apply the principles of scientific inquiry. (Implicit in this statement are the processes of prediction, estimation, developing hypotheses, drawing conclusions, evaluation, and following ethical principles and professional procedures.)

Science Standard	SC.H	Science SSS/Benchmark	2.4.2	FCAT Concept	H
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Description *Knows that scientists control conditions in order to obtain evidence, but when that is not possible for practical or ethical reasons, they try to observe a wide range of natural occurrences to discern patterns*

Essential Skill **Essential Skill Description**

s114 (Not Ranked) Know and apply the principles of scientific inquiry. (Implicit in this statement are the processes of prediction, estimation, developing hypotheses, drawing conclusions, evaluation, and following ethical principles and professional procedures.)

Science Standard	<i>SC.H</i>	Science SSS/Benchmark	<i>3.4.1</i>	FCAT Concept	M
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Description *Knows that performance testing is often conducted using small-scale models, computer simulations, or analogous systems to reduce the chance of system failure.*

Essential Skill **Essential Skill Description**

s115 (Not Ranked) Plan and apply real or hypothetical models and constructions to facilitate investigation and learning and the solution to practical problems.

Science Standard	<i>SC.H</i>	Science SSS/Benchmark	<i>3.4.2</i>	FCAT Concept	H
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Description *Knows that technological problems often create a demand for new scientific knowledge and that new technologies make it possible for scientists to extend their research in a way that advances science.*

Essential Skill **Essential Skill Description**

s116 (Not Ranked) Understand the impact upon society and the environment of scientific and technological discoveries and the contributions of scientists. Understand how society may accept or reject scientific discoveries based upon need or refusal to change.

Science Standard	<i>SC.H</i>	Science SSS/Benchmark	<i>3.4.3</i>	FCAT Concept	M
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Description *Knows that scientists can bring information, insights, and analytical skills to matters of public concern and help people understand the possible causes and effects of events.*

Essential Skill **Essential Skill Description**

s116 (Not Ranked) Understand the impact upon society and the environment of scientific and technological discoveries and the contributions of scientists. Understand how society may accept or reject scientific discoveries based upon need or refusal to change.

Science Standard	<i>SC.H</i>	Science SSS/Benchmark	<i>3.4.4</i>	FCAT Concept	L
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Description *Knows that funds for science research come from federal government agencies, industry, and private foundations and that this funding often influences the areas of discovery.*

Essential Skill **Essential Skill Description**

s116 (Not Ranked) Understand the impact upon society and the environment of scientific and technological discoveries and the contributions of scientists. Understand how society may accept or reject scientific discoveries based upon need or refusal to change.

Science Standard	<i>SC.H</i>	Science SSS/Benchmark	3.4.5	FCAT Concept	<table border="1"><tr><td><i>H</i></td></tr></table>	<i>H</i>
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Description *Knows that the value of a technology may differ for different people and at different times.*

Essential Skill **Essential Skill Description**

s116 (Not Ranked) Understand the impact upon society and the environment of scientific and technological discoveries and the contributions of scientists. Understand how society may accept or reject scientific discoveries based upon need or refusal to change.

Science Standard	<i>SC.H</i>	Science SSS/Benchmark	3.4.6	FCAT Concept	<table border="1"><tr><td><i>H</i></td></tr></table>	<i>H</i>
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Description *Knows that scientific knowledge is used by those who engage in design and technology to solve practical problems, taking human values and limitations into account.*

Essential Skill **Essential Skill Description**

s115 (Not Ranked) Plan and apply real or hypothetical models and constructions to facilitate investigation and learning and the solution to practical problems.