

## FLORIDA SCIENCE STANDARDS: GRADE 7

INSTRUCTIONS: At the end of your final 180 days of teaching, complete this checklist indicating a **mastered skill** by circling **M** or circle **W** for a **skill you are working on**. If you find a **skill you are not ready to tackle**, circle **NA**. Submit this checklist with a completed a Private School Covering Semester Report available at <http://www.mycca.org/updates.htm>. Completed checklists for subjects that students are taking through CCA group classes are not required.

### Big Idea1:

**A: Scientific inquiry is a multifaceted activity; The processes of science include the formulation of scientifically investigable questions, construction of investigations into those questions, the collection of appropriate data, the evaluation of the meaning of those data, and the communication of this evaluation.**

**B: The processes of science frequently do not correspond to the traditional portrayal of "the scientific method."**

**C: Scientific argumentation is a necessary part of scientific inquiry and plays an important role in the generation and validation of scientific knowledge.**

**D: Scientific knowledge is based on observation and inference; it is important to recognize that these are very different things. Not only does science require creativity in its methods and processes, but also in its questions and explanations.**

STATUS	SKILL
M    W    NA	Define a problem from the seventh grade curriculum, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.
M    W    NA	Differentiate replication (by others) from repetition (multiple trials).
M    W    NA	Distinguish between an experiment (which must involve the identification and control of variables) and other forms of scientific investigation and explain that not all scientific knowledge is derived from experimentation.
M    W    NA	Identify test variables (independent variables) and outcome variables (dependent variables) in an experiment.
M    W    NA	Describe the methods used in the pursuit of a scientific explanation as seen in different fields of science such as biology, geology, and physics.
M    W    NA	Explain that empirical evidence is the cumulative body of observations of a natural phenomenon on which scientific explanations are based.
M    W    NA	Explain that scientific knowledge is the result of a great deal of debate and confirmation within the science community.

**Supporting Idea10: A. Energy is involved in all physical processes and is a unifying concept in many areas of science. B. Energy exists in many forms and has the ability to do work or cause a change.**

STATUS	SKILL
M    W    NA	Illustrate that the sun's energy arrives as radiation with a wide range of wavelengths, including infrared, visible, and ultraviolet, and that white light is made up of a spectrum of many different colors.
M    W    NA	Observe and explain that light can be reflected, refracted, and/or absorbed.
M    W    NA	Recognize that light waves, sound waves, and other waves move at different speeds in different materials.

### Big Idea11:

**A. Waves involve a transfer of energy without a transfer of matter.**

**B. Water and sound waves transfer energy through a material.**

**C. Light waves can travel through a vacuum and through matter.**

**D. The Law of Conservation of Energy: Energy is conserved as it transfers from one object to another and from one form to another.**

STATUS	SKILL
M    W    NA	Recognize that adding heat to or removing heat from a system may result in a temperature change and possibly a change of state.
M    W    NA	Investigate and describe the transformation of energy from one form to another.
M    W    NA	Cite evidence to explain that energy cannot be created nor destroyed, only changed from one form to another.
M    W    NA	Observe and describe that heat flows in predictable ways, moving from warmer objects to cooler ones until they reach the same temperature.

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### Big Idea15:

A. The scientific theory of evolution is the organizing principle of life science.

B. The scientific theory of evolution is supported by multiple forms of evidence.

C. Natural Selection is a primary mechanism leading to change over time in organisms.

STATUS			SKILL
M	W	NA	Recognize that fossil evidence is consistent with the scientific theory of evolution that living things evolved from earlier species.
M	W	NA	Explore the scientific theory of evolution by recognizing and explaining ways in which genetic variation and environmental factors contribute to evolution by natural selection and diversity of organisms.
M	W	NA	Explore the scientific theory of evolution by relating how the inability of a species to adapt within a changing environment may contribute to the extinction of that species.

### Big Idea16:

A. Reproduction is characteristic of living things and is essential for the survival of species.

B. Genetic information is passed from generation to generation by DNA; DNA controls the traits of an organism.

C. Changes in the DNA of an organism can cause changes in traits, and manipulation of DNA in organisms has led to genetically modified organisms.

STATUS			SKILL
M	W	NA	Understand and explain that every organism requires a set of instructions that specifies its traits, that this hereditary information (DNA) contains genes located in the chromosomes of each cell, and that heredity is the passage of these instructions from one generation to another.
M	W	NA	Determine the probabilities for genotype and phenotype combinations using Punnett Squares and pedigrees.
M	W	NA	Compare and contrast the general processes of sexual reproduction requiring meiosis and asexual reproduction requiring mitosis.
M	W	NA	Recognize and explore the impact of biotechnology (cloning, genetic engineering, artificial selection) on the individual, society and the environment.

### Big Idea17:

A. Plants and animals, including humans, interact with and depend upon each other and their environment to satisfy their basic needs.

B. Both human activities and natural events can have major impacts on the environment.

C. Energy flows from the sun through producers to consumers.

STATUS			SKILL
M	W	NA	Explain and illustrate the roles of and relationships among producers, consumers, and decomposers in the process of energy transfer in a food web.
M	W	NA	Compare and contrast the relationships among organisms such as mutualism, predation, parasitism, competition, and commensalism.
M	W	NA	Describe and investigate various limiting factors in the local ecosystem and their impact on native populations, including food, shelter, water, space, disease, parasitism, predation, and nesting sites.

### Big Idea2:

A. Scientific knowledge is based on empirical evidence, and is appropriate for understanding the natural world, but it provides only a limited understanding of the supernatural, aesthetic, or other ways of knowing, such as art, philosophy, or religion.

B. Scientific knowledge is durable and robust, but open to change.

C. Because science is based on empirical evidence it strives for objectivity, but as it is a human endeavor the processes, methods, and knowledge of science include subjectivity, as well as creativity and discovery.

STATUS			SKILL
M	W	NA	Identify an instance from the history of science in which scientific knowledge has changed when new evidence or new interpretations are encountered.

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**Big Idea3: The terms that describe examples of scientific knowledge, for example; "theory," "law," "hypothesis," and "model" have very specific meanings and functions within science.**

STATUS	SKILL
M    W    NA	Recognize and explain the difference between theories and laws and give several examples of scientific theories and the evidence that supports them.
M    W    NA	Identify the benefits and limitations of the use of scientific models.

**Big Idea6: Over geologic time, internal and external sources of energy have continuously altered the features of Earth by means of both constructive and destructive forces. All life, including human civilization, is dependent on Earth's internal and external energy and material resources.**

STATUS	SKILL
M    W    NA	Describe the layers of the solid Earth, including the lithosphere, the hot convecting mantle, and the dense metallic liquid and solid cores.
M    W    NA	Identify the patterns within the rock cycle and relate them to surface events (weathering and erosion) and sub-surface events (plate tectonics and mountain building).
M    W    NA	Identify current methods for measuring the age of Earth and its parts, including the law of superposition and radioactive dating.
M    W    NA	Explain and give examples of how physical evidence supports scientific theories that Earth has evolved over geologic time due to natural processes.
M    W    NA	Explore the scientific theory of plate tectonics by describing how the movement of Earth's crustal plates causes both slow and rapid changes in Earth's surface, including volcanic eruptions, earthquakes, and mountain building.
M    W    NA	Identify the impact that humans have had on Earth, such as deforestation, urbanization, desertification, erosion, air and water quality, changing the flow of water.
M    W    NA	Recognize that heat flow and movement of material within Earth causes earthquakes and volcanic eruptions, and creates mountains and ocean basins.