Wakulla County Schools

MIDDLE SCHOOL COMPREHENSIVE SCIENCE CURRICULUM

Seventh Grade - Course #2002070

Revised June, 2011

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M/J Comprehensive Science 2
Course #2002070

This curriculum is based upon the Next Generation Sunshine State Standards for Science and the Course Description for M/J Comprehensive Science 2. Seventh grade science instruction should fully instruct students on the benchmarks contained in this document.

Documentation:
Teachers should document when instruction is provided on the benchmarks. The date noted should correspond to a specific lesson or unit of instruction as noted in the teacher's lesson plans or to when an assessment was given to determine student mastery of the benchmark.

Major Tool of Instruction:
The major tool of instruction provided to all teachers is the Glencoe *i*Science – Course 2, 2010 text. It is critical that teachers require that students access the text in order to build content-area reading skills. Time spent reading the more complex science text will help students build cognitive endurance for other reading tasks. This will also be a requirement as we move to incorporate the Common Core Literacy Standards over the next three years. Other resources may be incorporated to insure that all students achieve mastery of the required benchmarks. *Correlation page numbers referring to the Teacher's Edition (TE) correspond to the wrap-around version of the teacher's edition.*
NOTE: Laboratory investigations which include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course.

Assessment Information:
The information under 'Assessment' for each benchmark is taken directly from the FCAT 2.0 Test Specification document. This information must be used to help 'unpack' the benchmarks and set content limits for instruction.

Key to Acronyms and Markings:
Bold Print – FCAT Vocabulary – Middle School
Marked with * - FCAT Vocabulary that was tested at 5th grade
CPALMS – www.floridastandards.org

Appendix A: A list of vocabulary from all benchmarks in this course
Appendix B: A scope and sequence of vocabulary for grades 6-8; a K-5 scope and sequence is available on the district website

Required Professional Norms

As teachers encourage and support the critical thinking of students in classrooms, ongoing debate and discussion is inevitable. Therefore, it is important to establish professional standards that set the stage for norm setting in the classroom.

All Wakulla educators are expected to adhere to the following professional norms when addressing controversial issues and to use these norms as a baseline for helping students agree upon guidelines to govern classroom interaction.

1. **Critical analysis of a topic or subject is welcome.**
2. **Differing belief systems are treated with respect.**
3. **There is no place for ridicule in the classroom.**
4. **While students are required to learn and are tested on content as required by state standards, there is no requirement to agree with a stated position.**
   Please note that a parent may request a related alternative assignment when there is strong objection to content.
5. **Students are not penalized for proffering an alternative position on a controversial issue.**

Common Core Standards:

The following two pages provide the Literacy Standards from the Common Core State Standards (CCSS), which are to be incorporated with all science instruction.

Reading Standards for Literacy in Science and Technical Subjects 6-8

Key Details

1. Cite specific textual evidence to support analysis of science and technical texts.
2. Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
3. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

Craft and Structure

4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
5. Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

Integration of Knowledge and Ideas

7. Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table)
8. Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
9. Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Range of Reading and Level of Text Complexity

10. By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

Writing Standards for Literacy in History/Social Studies, Science and Technical Subjects 6-8

Text Types and Purposes

1. Write arguments focused on *discipline-specific content.*
    a. Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims,a nd organize the reasons and evidence logically.
    b. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.
    c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.
    d. Establish and maintain a formal style.
    e. Provide a concluding statement or section that follows from and supports the argument presented.

SCIENCE CURRICULUM – Seventh Grade

Body of Knowledge: Nature of Science

Big Idea 1: The Practice of Science

- **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.**

BENCHMARK CODE	BENCHMARK	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE					
			11/12	12/13	13/14	14/15	15/16	16/17
SC.7.N.1.1	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 observation or experiments, identify variables, collect and organize data, interpret data in charts, tables and graphics, analyze information, make predictions and defend conclusions. Complexity: High	The Nature of Science benchmarks are foundational to all science inquiry. They must be reinforced with every investigation. Ongoing investigations are critical to the mastery of the concepts in the NGSSS for science.						
SC.7.N.1.2	Differentiate replication (by others) from repetition (multiple trials). Complexity: Moderate							
SC.7.N.1.3	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. Complexity: Moderate							
SC.7.N.1.4	Identify test variables (independent variables) and outcome variables (dependent variables) in an experiment. Complexity: Low							
SC.7.N.1.5	Describe the methods used in the pursuit of a scientific explanation as seen in different fields of science such as biology, geology and physics. Complexity: Moderate							

SC.7.N.1.6	Explain that empirical evidence is the cumulative body of observations of a natural phenomenon on which scientific explanations are based. Complexity: Moderate							
SC.7.N.1.7	Explain that scientific knowledge is the result of a great deal of debate and confirmation within the science community. Complexity: Moderate							
Associated Vocabulary	**Empirical evidence,** natural phenomenon, biology, geology, physics, **outcome variable, test variable, controlled variable**							

Assessment Information

SC.7.N.1.1 , SC.7.N.1.3 and SC.7.N.1.4 are assessed as SC.8.N.1.1 in 8th grade. Task will require students to evaluate a scientific investigation using evidence of scientific thinking and/or problem solving; identify test variables (independent variables) and/or outcome variables (dependent variables) in a given scientific investigation; interpret and/or analyze data to make predictions and/or defend conclusions; distinguish between an experiment and other types of scientific investigations where variables cannot be controlled; explain how hypotheses are valuable.

SC.7.N.1.2

Reporting Category: Nature of Science

Benchmark Clarification: Task will require students to differentiate between replication and repetition; explain why scientific investigations should be replicable; compare methods and/or results obtained in a scientific investigation; evaluate the use of repeated trials or replication in a scientific investigation.

Prior Knowledge: SC.3.N.1.2, SC.3.N.1.5, SC.4.N.1.2, SC.4.N.1.5, SC.5.N.1.3, SC.5.N.2.2

Sample Item:

The following statements were taken from the procedures of four different investigations.

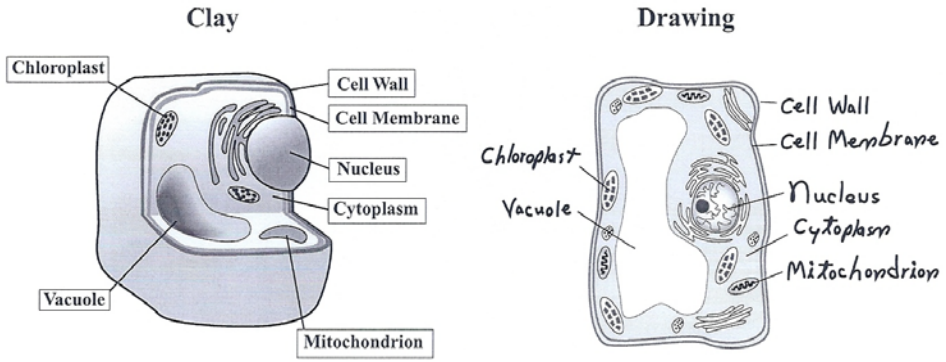
Investigation	Statement
1	Pour 50 milliliters (mL) of water down four inclined surfaces.
2	Roll a marble down the ramp from a height of 10 centimeters (cm), 20 cm, and 30 cm.
3	Take the mass of five rocks separately and then determine the average mass in grams (g).
4	Conduct four trials of counting the bubbles produced by a water plant for 1 minute (min) each.

The statement from which investigation is an example of repetition?

A. Investigation 1 B. Investigation 2 C. Investigation 3 **D. Investigation 4 ♦**

Also Assesses: SC.6.N.1.2, SC.6.N.1.4, SC.8.N.1.2

SC.7.N.1.5
Reporting Category: Nature of Science
Benchmark Clarification: Task will require students to describe and/or analyze common methods and/or models used in different fields of study; identify the benefits and/or limitations of the use of scientific models; identify how technology is essential to science.
Content Limits: Items assessing technology will focus on the role of technology in science as opposed to specific technology.
Prior Knowledge: SC.3.N.3.2, SC.3.N.3.3, SC.4.N.3.1, SC.6.N.3.4
Sample Item:
Two types of models that can be used to show details of the structures of cells are shown below.



Which of the following describes a limitation of the drawing but NOT the clay model?

A. It does not represent the main parts of a cell.
B. It does not contain the correct number of nuclei.
C. It cannot represent a living cell, since a true cell is three-dimensional. ♦
D. It cannot represent a living cell, since the cytoplasm should be in constant motion.

Also Assesses: SC.7.N.3.2, SC.8.N.1.5, SC.8.E.5.10

SC.7.N.1.6 and SC.7.N.1.7 are assessed as SC.6.N.2.2 in 8th grade. Task will require students to explain that scientific knowledge may change as new evidence is discovered or new scientific interpretations are formed; explain that scientific explanations are based on empirical evidence, logical reasoning, predictions and modeling; identify instances in the history of science in which science knowledge has changed as a result of new evidence.

Access Points for Students with Significant Cognitive Disability		
Independent:	**Supported:**	**Participatory:**
SC.7.N.1.In.a Identify a problem from the seventh grade curriculum, use reference materials to gather information, carry out an experiment, collect and record data, and report results. SC.7.N.1.In.b Recognize the relationship between the end product (dependent variable) and in the input (independent variable) in an experiment. SC.7.N.1.In.c Identify questions that can be answered by scientific investigation, such as can a plant grow without sunlight? SC.7.N.1.In.d Identify ways that science can be used to study different areas, such as life science, earth and space science, and physical science. SC.7.N.1.In.e Identify that scientific knowledge is based on a large body of evidence and observations.	SC.7.N.1.Su.a Recognize a problem from the seventh grade curriculum, use materials to gather information, conduct a simple experiment, and record and share results. SC.7.N.1.Su.b Recognize what is tested in a simple experiment (dependent variable). SC.7.N.1.Su.c Recognize a question that can be answered by scientific investigation, such as can a plant grow without sunlight? SC.7.N.1.Su.d Recognize that science includes different areas, such as life science, earth and space science, and physical science. SC.7.N.1.Su.e Recognize that scientific knowledge is based on evidence and observations.	SC.7.N.1.Pa.a Recognize a problem related to the seventh grade curriculum, observe and explore objects and activities, and recognize a solution. SC.7.N.1.Pa.b Recognize observable changes in a simple experiment, such as plant growth. SC.7.N.1.Pa.c Associate objects and activities with science. SC.7.N.1.Pa.c Associate objects and activities with science.

Body of Knowledge: Nature of Science

Big Idea 2: The characteristics of Scientific Knowledge

- **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.**

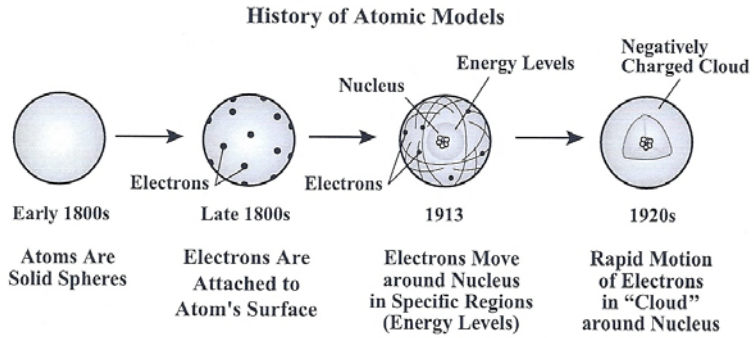
BENCHMARK CODE	BENCHMARK	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE					
			11/12	12/13	13/14	14/15	15/16	16/17
SC.7.N.2.1	Identify an instance from the history of science in which scientific knowledge has changed when new evidence or new interpretations are encountered. Complexity: Low	**Please refer to the Professional Norms on page 3 of this document.**						
Associated Vocabulary	See Big Idea 1.							
Connection	**Social Studies:**							
Assessment Information	**SC.7.N.2.1** is assessed as SC.6.N.2.2 in 8th grade. Task will require students to explain that scientific knowledge may change as new evidence is discovered or new scientific interpretations are formed; explain that scientific explanations are based on empirical evidence, logical reasoning, predictions and modeling; identify instances in the history of science in which science knowledge has changed as a result of new evidence.							

Access Points for Students with Significant Cognitive Disability

Independent:	**Supported:**	**Participatory:**
SC.7.N.2.In.a Identify an example of a change in scientific knowledge based on new evidence or new interpretations.	SC.7.N.2.Su.a Recognize an example of a change in scientific knowledge based on new evidence.	SC.7.N.2.Pa.a Recognize information related to science.

Body of Knowledge: Nature of Science

Big Idea 3: The Role of Theories, Laws, Hypotheses, and Models **The terms that describe examples of scientific knowledge, for example; "theory," "law," "hypothesis," and "model" have very specific meanings and functions within science.**									
BENCHMARK CODE	**BENCHMARK**	**RESOURCES/ACTIVITIES/TEXT CORRELATION**	**DATE**						
			11/12	**12/13**	**13/14**	**14/15**	**15/16**	**16/17**
SC.7.N.3.1	Recognize and explain the difference between theories and laws and give several examples of scientific theories and the evidence that supports them. Complexity: High							
SC.7.N.3.2	Identify the benefits and limitations of the use of scientific models. Complexity: Moderate							
Associated Vocabulary	**Scientific theory, scientific law, scientific models**							
Assessment Information	**SC.7.N.3.2** is assessed as SC.7.N.1.5 at 8th grade. Task will require students to describe and/or analyze common methods and/or models used in different fields of study; identify the benefits and/or limitations of the use of scientific models; identify how technology is essential to science. **SC.7.N.3.1** **Reporting Category:** Nature of Science **Benchmark Clarifications:** Task will require students to explain the difference between theories and laws; identify examples of theories and/or laws; explain why theories may be modified but are rarely discarded. **Content Limits:** Items addressing scientific theories and/or laws are limited to those found in the middle school science benchmarks, such as law of universal gravitation, law of super position, theory of plate tectonics, atomic theory, law of conservation of mass, law of conservation of energy, cell theory, and the scientific theory of evolution. **Prior Knowledge:** SC.6.N.3.2, SC.6.N.3.3 **Sample Item:** A timeline of some models of atoms throughout history is shown below. These models have contributed to the formation of the atomic theory.								



Which of the statements BEST summarizes the development of the atomic theory over time?

A. Advancements in atomic models proved the atomic theory was accurate.
B. The discovery of new evidence resulted in changes to the atomic theory. ♦
C. With the discovery of every new element, the atomic theory was modified.
D. Changes in atomic models showed that the atomic theory was based on opinion.

Also Assesses: SC.6.N.3.1, SC.8.N.3.2

Access Points for Students with Significant Cognitive Disability

Independent:	**Supported:**	**Participatory:**
SC.7.N.3.In.a Identify that scientific theories are explanations and laws describe relationships, and both are supported by evidence. SC.7.N.3.In.b Identify a benefit of using a model to explain how things work.	SC.7.N.3.Su.a Recognize that scientific theories and laws are supported by evidence. SC.7.N.3.Su.b Recognize a benefit of using a model to explain how things work.	SC.7.N.3.Pa.a Recognize that people use science to solve problems. SC.7.N.3.Pa.b Recognize a model of a common activity.

Body of Knowledge: Earth Science

Big Idea 6: Earth Structures
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.

BENCHMARK CODE	BENCHMARK	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE					
			11/12	12/13	13/14	14/15	15/16	16/17
SC.7.E.6.1	Describe the layers of the solid Earth, including the lithosphere, the hot convecting mantle, and the dense metallic liquid and solid cores. Complexity: Moderate	**Text:** Chapter 1, Lesson 2						
SC.7.E.6.2	Identify the patterns within the rock cycle and relate them to resurface events (weathering and erosion) and sub-surface events (plate tectonics and mountain building). Complexity: High	**Text:** Chapter 2, Lesson 3						
SC.7.E.6.3	Identify current methods for measuring the age of Earth and its parts including the law of superposition and radioactive dating. Complexity: Moderate	**Text:** Chapter 3, Lesson 1 **Please refer to the Professional Norms on page 3 of this document.**						
SC.7.E.6.4	Explain and give examples of how physical evidence supports scientific theories that Earth has evolved over geologic time due to natural processes. Complexity: High	**Text:** Chapter 3, Lessons 2, 3 **Please refer to the Professional Norms on page 3 of this document.**						
SC.7.E.6.5	Explore the scientific theory of plate tectonics by describing how the movement of Earth's crustal plates cause both slow and rapid changes in Earth's surface, including volcanic eruptions, earthquakes, and mountain building. Complexity: Moderate	**Text:** Chapter 4, Lesson 3; Chapter 5, Lessons 1, 2, 3, 4; Chapter , Lessons 1, 2						
SC.7.E.6.6	Identify the impact that humans have had on Earth, such as deforestation, urbanization, desertification, erosion, air and water quality, changing the flow of water. Complexity: Moderate	**Text:** Chapter 7						
SC.7.E.6.7	Recognize that heat flow and movement of material within Earth causes earthquakes and volcanic eruptions, and creates mountains and ocean basins. Complexity: Moderate	**Text:** Chapter 6, Lesson 1, 2,						

Associated Vocabulary	**Fault, fold, infiltration, percolation,** convecting, deforestation, urbanization, desertification
Assessment Information	**SC.7.E.6.2 and SC.7.E.6.6** **Reporting Category:** Earth & Space Science **Benchmark Clarification:** Task will require students to identify and/or describe steps of the rock cycle and relate them to surface and sub-surface events; describe and/or explain how Earth's surface is built up and torn down through the processes of physical and chemical weathering, erosion and deposition; identify different types of landforms commonly found on Earth; describe similarities and/or differences among landforms found in Florida and those found outside of Florida; identify and/or describe the impact that humans have had on Earth. **Content Limits:** Items may use the context of plate tectonics to assess the rock cycle but will not directly assess plate tectonics; Items will not assess the role of plate tectonics in landform formation; Items may assess the features of karst topography, such as aquifers, caverns, and/or sinkholes, but will not use the term *karst topography*. **Prior Knowledge:** SC.4.E.6.1, SC.4.E.6.2, SC.4.E.6.3, SC.4.E.6.4, SC.4.E.6.6 **Sample Item:** Deforestation occurs when large areas of trees are cut down. Which of the following impacts on the environment would result from deforestation? **A. Increased erosion ♦** B. Colder temperatures C. Excess ground moisture D. Greater oxygen production **SC.7.E.6.4** **Reporting Category:** Earth & Space Science **Benchmark Clarification:** Task will require students to identify examples of and/or explain physical evidence that supports scientific theories that Earth has evolved over geologic time due to natural processes; identify and/or describe current scientific methods for measuring the age of Earth and its parts. **Content Limits:** Items may address fossil records but should not require knowledge or recognition of specific organisms; Items may address folding and faulting as related to the law of superposition; Items assessing radioactive dating will be limited to a conceptual level; Items will not require calculations or address half-life; Items addressing geologic time will not require specific knowledge of eras, periods or epochs. **Sample Item:** The oldest rock formation identified on Earth is found on the shoreline of Hudson Bay in Canada. This rock formed 4.28 billion years ago. What information does a scientist need to more accurately determine the age of a rock? A. The percentage of each mineral that makes up the rock B. The thickness of younger rock layers that cover the rock **C. The amount of each radioactive element present in the rock ♦** D. The amount of weathering present on the surface of the rock **Also Assesses:** SC.7.E.6.3

SC.7.E.6.5

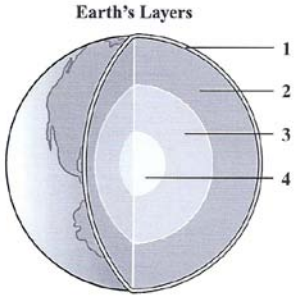
Reporting Category: Earth & Space Science

Benchmark Clarification: Task will require students to describe the scientific theory of plate tectonics and/or how the movement of Earth's crustal plates and the flow of heat and material cause various geologic events to occur; identify and/or describe the layers of Earth.

Content Limits: Items will not assess types of volcanoes but may assess different causes of volcano formation; Items will not assess types of earthquake waves; Items may assess density differences between layers of Earth but will not assess density differences as they relate to plate tectonics; Items assessing the layers of Earth are limited to the crust, the lithosphere, the hot convecting mantle, the outer (liquid) core, and the inner (solid) core.

Sample Item:

Interactions between layers of Earth causes convection currents to move crustal plates. The diagram below shows four layers of Earth



In which layer of Earth are the convection currents that directly result in tectonic plate motion found?

A. 1 **B. 2 ♦** C. 3 D. 4

Also assesses: SC.7.E.6.1, SC.7.E.6.7

Access Points for Students with Significant Cognitive Disability

Independent:	**Supported:**	**Participatory:**
SC.7.E.6.In.a Identify that Earth has three layers (crust, mantle, and core) and describe the inside (core) as the hottest layer. SC.7.E.6.In.b Recognize that slow changes, such as mountain-building, and fast changes, such as volcanic eruptions, are caused by shifts below Earth's surface. SC.7.E.6.In.c Demonstrate how older rock layers are deposited at the bottom before younger layers (Law of Superposition). SC.7.E.6.In.d Identify physical evidence, such as fossils and sedimentary rock, which show how Earth has changed over a very long period of time. SC.7.E.6.In.e Recognize that humans have had an impact on Earth, such as polluting the air and water and expanding urban areas and road systems.	SC.7.E.6.Su.a Recognize that the surface of Earth is called the crust. SC.7.E.6.Su.b Recognize that mountains change size and shape over a long period of time. SC.7.E.6.Su.c Recognize that fossils are remains or imprints of living things from long ago. SC.7.E.6.Su.d Recognize the effects of earthquakes and volcanoes. SC.7.E.6.Su.e Recognize that polluting the air and water can harm Earth.	SC.7.E.6.Pa.a Recognize the ground as the outer surface (crust) of Earth. SC.7.E.6.Pa.b Discriminate between surface features of ground on Earth, such as rocky/sandy, flat/hilly, rough/smooth, or solid/liquid. SC.7.E.6.Pa.c Recognize that ground on the Earth's surface changes over time. SC.7.E.6.Pa.d Distinguish between clean and dirty water.

Body of Knowledge: Physical Science

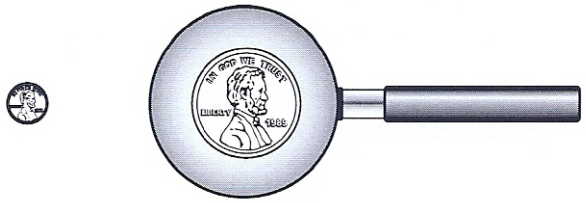
Big Idea 10: Forms of Energy

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.

BENCHMARK CODE	BENCHMARK	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE					
			11/12	12/13	13/14	14/15	15/16	16/17
SC.7.P.10.1	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. Complexity: Low	**Text:** Teacher's edition pages 274, 312, 352-356, 368						
SC.7.P.10.2	Observe and explain that light can be reflected, refracted and/or absorbed. Complexity: High	**Text:** Teacher's edition pages 326-334, 354-356m 360-362; 366-368						
SC.7.P.10.3	Recognize that light waves, sound waves and other waves move at different speeds in different materials. Complexity: Low	**Text:** Teacher's edition pages 273, 320, 328, 342, 344, 352						
Associated Vocabulary	**Amplitude, translucent, transparent, opaque**							
Assessment Information	**SC.7.P.10.1** **Reporting Category:** Physical Science **Benchmark Clarifications:** Task will require students to identify, compare and/or contrast the variety of types of radiation present in radiation from the sun; identify and/or compare characteristics of the electromagnetic spectrum; identify common uses and/or applications of electromagnetic waves. **Content Limits:** Items may assess relative order of frequencies and wavelengths in the electromagnetic spectrum but will not require memorization of specific frequencies and wavelengths of electromagnetic radiation; Items will not address hazards of electromagnetic radiation; Items will address only electromagnetic waves and the electromagnetic spectrum; Item will not calculate calculations. **Sample Item:** Sunlight is composed of energy that is visible to humans and energy that is not visible to humans. Which statement describes how the visible energy from the Sun is different from non-visible energy? A. It travels at a different speed. B. It travels a different distance. **C. It has different wavelengths.** D. It has different amplitudes. **Also Assesses:** SC.8.E.5.11							

SC.7.P.10.3
Reporting Category: Physical Science
Benchmark Clarifications: Task will require students to describe and/or explain that waves move at different speeds through different materials; explain that light waves can be reflected, refracted and/or absorbed.
Content Limits: Items may assess the general relative order of wave speed in different phases but will not assess the motion of the particles in the substance; Items may assess pitch as related to frequency; Items will not assess color as related to wavelength; Items will not assess electromagnetic waves traveling in a vacuum; Items will not require calculations of wave speed through different materials; Items may address water waves but not in the context of water waves at the beach; Items will not assess the interaction of multiple waves.
Prior Knowledge: SC.3.P.10.1, SC.3.P.10.3, SC.3.P.10.4, SC.4.P.10.1, SC.4.P.10.3, SC.5.P.10.1
Sample Item:
The diagram below demonstrates how a magnifying lens can make a penny appear larger.



What property of the magnifying lens is most responsible for allowing it to magnify the penny?

A. It can reflect light.
B. It can refract light. ♦
C. It can increase the intensity of light.
D. It can increase the wavelength of light.

Also Assesses: SC.7.P.10.2

Access Points for Students with Significant Cognitive Disability

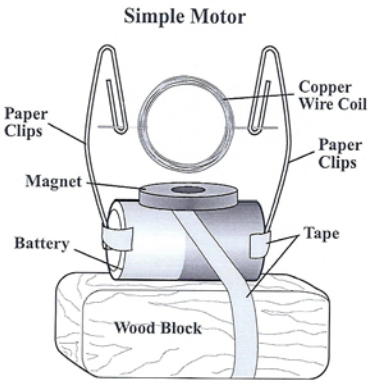
Independent:	**Supported:**	**Participatory:**
SC.7.P.10.In.a Identify that white (visible) light has many colors, such as when viewed with a prism.	SC.7.P.10.Su.a Recognize that white (visible) light contains many colors, such as viewed with a prism or rainbow.	SC.7.P.10.Pa.a Recognize primary colors of a rainbow.
SC.7.P.10.In.b Recognize that light can be reflected or absorbed.	SC.7.P.10.Su.b Recognize that light can be reflected.	SC.7.P.10.Pa.b Recognize reflections of objects.
SC.7.P.10.In.c Identify that light and sound travel in wave patterns.	SC.7.P.10.Su.c Recognize that sound and light travel.	SC.7.P.10.Pa.c Match light and sound to their sources.

Body of Knowledge: Physical Science

Big Idea 11: Energy Transfer and Transformations

- **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.**

BENCHMARK CODE	BENCHMARK	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE					
			11/12	12/13	13/14	14/15	15/16	16/17
SC.7.P.11.1	Recognize that adding heat to or removing heat from a system may result in a temperature change and possibly a change of state. Complexity: Low	**Text:** Teacher's edition pages 288. 292						
SC.7.P.11.2	Investigate and describe the transformation of energy from one form to another. Complexity: Moderate	**Text:** Teacher's edition pages 276-284; 292-294; 355						
SC.7.P.11.3	Cite evidence to explain that energy cannot be created nor destroyed, only changed from one form to another. Complexity: High	**Text:** Teacher's edition pages 278						
SC.7.P.11.4	Observe and describe that heat flows in predictable ways, moving from warmer objects to cooler ones until they reach the same temperature. Complexity: Moderate	**Text:** Teacher's edition pages 268, 290, 294						
Associated Vocabulary	transformation							
Assessment Information	**SC.7.P.11.2** **Reporting Category:** Physical Science **Benchmark Clarification:** Task will require students to identify and/or describe the transformation of energy from one form to another; differentiate between potential and kinetic energy; identify and/or explain situations where energy is transformed between kinetic energy and potential energy; identify and/or describe examples of the Law of Conservation of Energy. **Content Limits:** Items will not assess transformations involving nuclear energy; Items may address a maximum of five energy transformations; Items will not require calculations; Items assessing energy transformations will not be placed in a life science context. **Prior Knowledge:** SC.3.P.11.2, SC.5.P.10.4 **Sample Item:** Emma constructed a simple motor. When connected correctly, the coil of copper wire spins.							

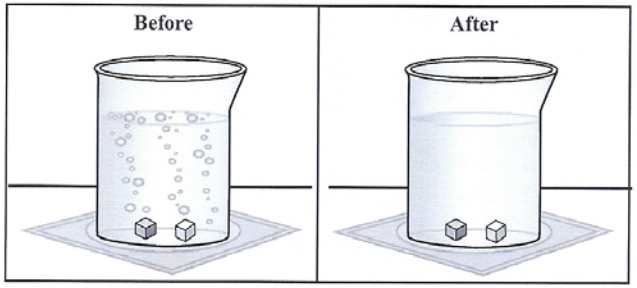


Which of the following best describes the energy transformation that takes place between the paper clips and the spinning coil?

A. Chemical energy transforms into electrical energy.
B. Mechanical energy transforms into electrical energy.
C. Electrical energy transforms into mechanical energy. ♦
D. Mechanical energy transforms into chemical energy.

Also Assesses: SC.6.P.11.1, SC.7.P.11.3

SC.7.P.11.4
Reporting Category: Physical Science
Benchmark Clarifications: Task will require students to describe how heat flows in predictable ways; explain that adding heat to or removing heat from a system may result in a temperature change and possibly a change of state.
Content Limits: Items will not address chemical changes; Items will not require calculations; Items will not assess the concepts of conductors and insulators or examples of either in isolation; Items will not require the use or memorization of formulas or values of specific heat, heat of fusion or heat of vaporization for substances; Items may assess the concept of specific heat.
Stimulus Attributes: Scenarios addressing methods of heat transfer (conduction, convection, radiation) will not use an Earth Science context; Temperature wi C).
Response Attribute: C).
Prior Knowledge: SC.3.P.9.1, SC.3.P.11.1, SC.4.P.11.1, SC>4.P.11.2
Sample Item:
Ms. Aldaco added a copper (Cu) cube that is at room temperature and an aluminum (Al) cube that she just removed from the freezer to a beaker of boiling water.



She left the cubes in the water for three hours. Which of the following describes a heat flow that took place during those three hours?

A. From the aluminum cube to the beaker
B. From the copper cube to the boiling water
C. From the aluminum cube to the copper cube
D. From the boiling water to the aluminum cube ♦

Also Assesses: SC.7.P.11.1

Access Points for Students with Significant Cognitive Disability		
Independent:	**Supported:**	**Participatory:**
SC.7.P.11.In.a Identify that when heat is added or taken away, a temperature change occurs. SC.7.P.11.In.b Recognize that one form of energy can change to other forms of energy, such as solar panels change light into electricity. SC.7.P.11.In.c Identify examples of the predictable movement of heat, such as hot air rises and heat transfers from hot to cold objects.	SC.7.P.11.Su.a Recognize what happens to the temperature when heat is added. SC.7.P.11.Su.b Recognize that energy can change forms, such as electricity produces light and heat in a lamp. SC.7.P.11.Su.c Identify that heat rises.	SC.7.P.11.Pa.a Recognize that a hot object can make a cold object warm when they touch. SC.7.P.11.Pa.b Recognize that electrical devices need energy to work.

Body of Knowledge: Life Science

Big Idea 15: Diversity and Evolution of Living Organisms

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.

BENCHMARK CODE	BENCHMARK	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE					
			11/12	12/13	13/14	14/15	15/16	16/17
SC.7.L.15.1	Recognize that fossil evidence is consistent with the scientific theory of evolution that living things evolved from earlier species. Complexity: Moderate	**Text:** Chapter 13, Lesson 1, Lesson 3 – Students should examine a variety of fossil evidence and draw conclusions. **Please refer to the Professional Norms on page 3 of this document.**						
SC.7.L.15.2	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. Complexity: High	**Text:** Chapter 13, Lesson 2 **Please refer to the Professional Norms on page 3 of this document.**						
SC.7.L.15.3	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. Complexity: High	**Text:** Chapter 13 – TE(wrap around edition) pp 466-467 **Please refer to the Professional Norms on page 3 of this document.**						
Associated Vocabulary	**Evolution (scientific theory of)**							
Assessment Information	**SC.7.L.15.2** **Reporting Category:** Life Science **Benchmark Clarifications:** Task will require students to identify and/or explain ways in which genetic variation and environmental factors contribute to evolution by natural selection and diversity or organisms; identify and/or explain ways in which fossil evidence is consistent with the scientific theory of evolution; identify and/or explain how a species' inability to adapt may contribute to the extinction of that species. **Content Limits:** Items will not address topics such as speciation, genetic drift or gene pools; Items will not assess or address hominid evolution or primate fossils; Items assessing fossil evidence should focus on progressions over time/evolution from earlier species and/or the idea that not all species alive today were alive in the past; Items will not assess fossils in the context of relative dating or plate tectonics/continental movement. **Prior Knowledge:** SC.6.L.15.1, SC.5.L.17.1 **Sample Item:** A certain reptile species is an herbivore and exists only on an isolated island. Which of the following would **most likely** result in the extinction of							

	the reptile species over a period of twenty thousand years? A. The reptile species produces many offspring with many unique traits, and the vegetation remains constant. B. The reptile species produces few offspring with some unique traits, and the vegetation remains constant. **C. The reptile species produces few offspring with no unique traits, and the vegetation changes quickly. ♦** D. The reptile species produces many offspring with some unique traits, and the vegetation changes slowly. **Also Assesses:** SC.7.L.15.1, SC.7.L.15.3

Access Points for Students with Significant Cognitive Disability		
Independent:	**Supported:**	**Participatory:**
SC.7.L.15.In.a Recognize that fossils help people learn about living things that lived a very long time ago. SC.7.L.15.In.b Recognize that physical characteristics of living things are adapted to deal with the conditions of the environment, such as skin color or gills on a fish. SC.7.L.15.In.c Explain extinction and give examples.	SC.7.L.15.Su.a Identify fossils as parts of animals and plants that are no longer alive. SC.7.L.15.Su.b Recognize that common plants or animals have special features that enable them to live in their environment, such as a as a fish has gills so it can live underwater. SC.7.L.15.Su.c Recognize that some plants and animals no longer exist (are extinct).	SC.7.L.15.Pa.a Recognize that living things can die. SC.7.L.15.Pa.b Recognize a personal characteristic, such as hair color, that is different from the parents.

Body of Knowledge: Life Science

Big Idea 16: Heredity and Reproduction

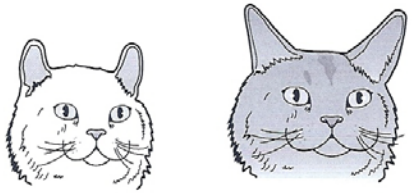
A. Reproduction is characteristic of living things and is essential for the survival of species.

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.

BENCHMARK CODE	BENCHMARK	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE					
			11/12	12/13	13/14	14/15	15/16	16/17
SC.7.L.16.1	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. Complexity: High	**Text:** Chapter 12, Lesson 1, Lesson 3						
SC.7.L.16.2	Determine the probabilities for genotype and phenotype combinations using Punnett Squares and pedigrees. Complexity: Moderate	**Text:** Chapter 12, Lesson 2; Inquiry Lab TE pages 446-447 (wrap around edition)						
SC.7.L.16.3	Compare and contrast the general processes of sexual reproduction requiring meiosis and asexual reproduction requiring mitosis. Complexity: Moderate							
SC.7.L.16.4	Recognize and explore the impact of biotechnology (cloning, genetic engineering, artificial selection) on the individual, society and the environment. Complexity: High	**Please refer to the Professional Norms on page 3 of this document.**						
Associated Vocabulary	**Allele, budding, F_1 generation, homozygous, recessive, binary fission, dominant, heterozygous, P generation, regeneration, dominate,** Punnett squares							
Assessment Information	**SC.7.L.16.1** **Reporting Category:** Life Science **Benchmark Clarification:** Task will require students to describe and/or explain that every organism requires a set of instructions that specifies its traits; identify and/or explain that hereditary information (DNA) contains genes located in the chromosomes of each cell and/or that heredity is the passage of these instructions from one generation to another; use Punnett squares and pedigrees to determine genotypic and phenotypic probabilities; compare and/or contrast general processes of sexual and asexual reproduction that results in the passage of hereditary information from one generation to another.							

Content Limits: Items may assess the general concepts of mitosis and meiosis but will not assess the phases of mitosis or meiosis. Items will not use the terms *haploid* or *diploid*; Items referring to sexual reproduction will not address human reproduction; Items addressing Punnett squares or pedigrees will only assess dominant and recessive traits; Items addressing pedigrees are limited to assessing the probability of a genotype or phenotype of a single individual. Items may require the identification of parental genotypes that result in certain genotypic or phenotypic probabilities in offspring; Items will not assess incomplete dominance, sex-linked traits, polygenic traits, multiple alleles, or codominance; Items addressing Punnett squares are limited to the P and F_1 generations; Items will not assess mutation; Items will not address or assess the stagesof meiosis, fertilization or zygote formation; Items will not address or assess human genetic disorders or diseases.
Stimulus Attribute: Genotype and phenotype probabilities will only be in percent.
Response Attribute: Options may be in the form of percents or percentages.
Prior Knowledge: SC.4.L.16.1, SC.4.L.16.2, SC.4.L.16.3
Sample Item:
The gene for curled ears (C) is dominant over the gene for straight ears (c). The picture below shows a cat with curled ears (Cc) and a cat with straight ears (cc).



Curled Ears Straight Ears

What **percent** of the offspring are expected to have curled ears as a result of a cross between the cats shown?
A. 100 B. 75 **C. 50 ♦** D. 25

Also Assesses: SC.7.L.16.2, SC.7.L.16.3

Access Points for Students with Significant Cognitive Disability

Independent:	**Supported:**	**Participatory:**
SC.7.L.16.In.a Explain that some characteristics are passed from parent to child (inherited). SC.7.L.16.In.b Recognize that it is possible to predict whether a person is likely to inherit a particular trait from parents. SC.7.L.16.In.c Explain that offspring receive half their genes from each parent in sexual reproduction. SC.7.L.16.In.d Recognize that science processes (biotechnology) have been used to develop new foods and medicines.	SC.7.L.16.Su.a Recognize that offspring have similar characteristics to parents. SC.7.L.16.Su.b Recognize that animals, including humans, inherit some characteristics from one parent and some from the other. SC.7.L.16.Su.c Recognize that science (biotechnology) has been used to develop new products for use in daily life.	SC.7.L.16.Pa.a Recognize a characteristic passed from parents to self, such as eye color. SC.7.L.16.Pa.b Recognize that children are born from two parents. SC.7.L.16.Pa.c Recognize common products, such as medicine, developed through science.

Body of Knowledge: Life Science

Big Idea 17: Interdependence

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.

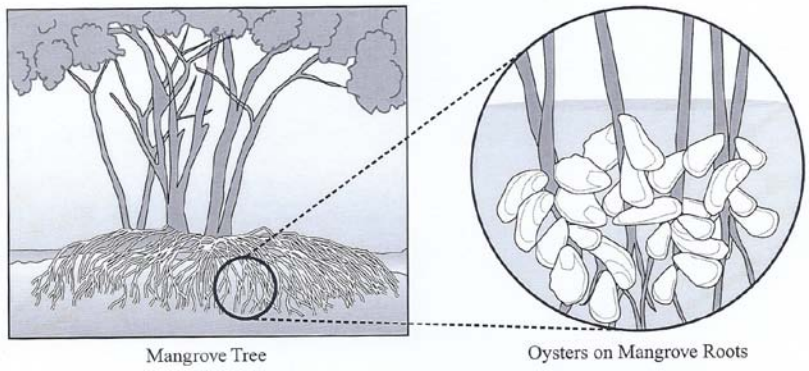
C. Energy flows from the sun through producers to consumers.

BENCHMARK CODE	BENCHMARK	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE					
			11/12	12/13	13/14	14/15	15/16	16/17
SC.7.L.17.1	Explain and illustrate the roles of and relationships among producers, consumers, and decomposers in the process of energy transfer in a food web. Complexity: High	**Text:** Chapter 14, Lesson 3						
SC.7.L.17.2	Compare and contrast the relationships among organisms such as mutualism, predation, parasitism, competition, and commensalism. Complexity: Moderate	**Text:** Chapter 14, Lesson 2						
SC.7.L.17.3	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. Complexity: High	**Text:** Chapter 14, Lessons 1, 2						
Associated Vocabulary	**Niche,** producer*, consumer*, decomposer*, mutualism, predation, parasitism, competition, commensalism, ecosystem*							
Assessment Information	**SC.7.L.17.2** **Reporting Category:** Life Science **Benchmark Clarifications:** Task will require students to compare and/or contrast relationships between organisms, such as mutualism, predation, parasitism, competition, and commensalism; describe and/or explain the roles of and relationships among producers, consumers, and decomposers in the process of energy transfer in a food web; identify and/or describe various limiting factors in an ecosystem and their impact on native populations. **Content Limits:** Items assessing the relationship between organisms may require the identification of the relationship as mutualism, predation, parasitism, competition, or commensalism; Items assessing the relationships of organisms may require recognition of common examples of mutualism, predation, parasitism, competition and/or commensalism; Items will not require specific knowledge of organisms; Items may assess food webs but will not assess food chains; Items assessing consumers in a food web are limited to primary, secondary and tertiary consumers; Items will not assess that the Sun is the source of energy for living things in isolation; Items will not address energy pyramids or use the term *trophic level*. **Stimulus Attribute:** Food webs may include a maximum of 15 organisms.							

Prior Knowledge: SC.4.L.17.2, SC.4.L.17.3, SC.4.L.17.4

Sample Item:

Mangrove trees are common in the Florida Everglades. The tree roots serve as a place for freshwater oysters to attach when the tide is high, as shown in the picture below. The oysters are protected from predators when attached to the roots underwater



The oysters do not harm the trees nor do they provide any benefit to the trees. Which of the following relationships is most similar to the relationship between the mangrove trees and the oysters?

A. African ants living in acacia trees feed on leaf-eating insects found on the tree.
B. Spider crabs are camouflaged by the green-brown algae growing on their shells.
C. A whale is unaffected by the attached remora fish feeding on the whales leftover food. ♦
D. Bees fly from one flowering plant to another, gathering nectar and pollinating the flowers.

Also Assesses: SC.7.L.17.1, SC.7.L.17.3

Access Points for Students with Significant Cognitive Disability

Independent:	**Supported:**	**Participatory:**
SC.7.L.17.In.a Identify that in a simple food chain, energy transfers from the Sun to plants (producers), to animals (consumers), and to organisms that cause decay (decomposers). SC.7.L.17.In.b Describe how organisms interact with other organisms in an ecosystem to help each other (mutualism), to obtain food (predation), and to benefit at the expense of the other (parasitism). SC.7.L.17.In.c Recognize that living things compete with each other to get the things they need to live in their local environment.	SC.7.L.17.Su.a Identify different types of consumers in a food chain, including animals that eat plants, animals that eat other animals, and animals that eat plants and animals. SC.7.L.17.Su.b Recognize how living things affect each other in their habitat (ecosystem). SC.7.L.17.Su.c Identify how a lack of food, water, or shelter affects plants and animals in their habitats.	SC.7.L.17.Pa.a Recognize that humans eat vegetables and fruits (plants) and meat (animals). SC.7.L.17.Pa.b Recognize a mutual relationship between people and other living things. SC.7.L.17.Pa.c Recognize what happens when animals don't get food and water.

Appendix A

Vocabulary

Allele	**Percolation**
Amplitude	Predation
Binary fission	Producer*
Biology	Punnett squares
Budding	Pysics
Commensalism	**Recessive**
Competition	**Regeneration**
Consumer*	**Scientific law**
Controlled variable	**Scientific models**
Convecting	**Scientific theory**
Decomposer*	**Test variable**
Deforestation	Transformation
Desertification	**Translucent**
Dominant	**Transparent**
Ecosystem*	Urbanization
Empirical evidence	
Evolution (scientific theory of)	
F_1 generation	
Fault	
Fold	
Geology	
Heterozygous	
Homozygous	
Infiltration	
Mutualism	
Natural phenomenon	
Niche	
Opaque	
Outcome variable	
P generation	
Parasitism	

Appendix B

Vocabulary Scope and Sequence

6th Grade		7th Grade	8th Grade
Abrasion*	Law of conservation of energy	**Allele**	**Astronomical unit**
Acceleration	Lipid	**Amplitude**	**Boiling point**
Active transport	Macromolecule	**Binary fission**	Carbon-based
Air pressure	mineral	Biology	Cellular respiration
Algae	Mitosis	**Budding**	**Chemical properties**
Atmosphere	Motion*	Commensalism	Chlorophyll
Autotrophs	Multicellular	Competition	**Controlled variable**
Bacteria	**Net Force**	Consumer*	**Dwarf planet**
Binomial nomenclature	Neuron	**Controlled variable**	**Heterogeneous**
Biosphere	Newton's 1st, 2nd, and 3rd laws,	Convecting	**Homogeneous**
Carbohydrate	Nuclei acid	Decomposer*	**Hypothesis**
Cell	Nucleus	Deforestation	**Light year**
Cell cycle	observation*	Desertification	**Melting point**
Cell membrane	Order	**Dominant**	**Molecule**
Cell theory	Organ system	Ecosystem*	**Nebula**
Cell wall	Organ*	**Empirical evidence**	**Nucleus**
Cellular respiration	Organelle	**Evolution (scientific theory of)**	**Outcome variable (dependent variable)**
Centromere	organic matter	**F_1 generation**	Photosynthesis
Chloroplast	Organism	**Fault**	Pseudoscientific
class	Osmosis	**Fold**	**Repetition**
climate*	**outcome variable (dependent)**	Geology	**Replication**
Compact bone	oxidation	**Heterozygous**	**Saturation**
condensation*	Ozone layer	**Homozygous**	**Scientific law**
Conduction*	Parasites unicellular	**Infiltration**	**Scientific model**
controlled variable	Passive transport	Mutualism	**Scientific theory**
Convection	**pH**	Natural phenomenon	**Solute**
Cryosphere	Photosynthesis	**Niche**	**Solvent**
Cyokinesis	Phylum	**Opaque**	**Systematic observation**
Cytoplasm	Precipitation*	**Outcome variable**	**Test variable (independent variable**
decomposition	prediction*	**P generation**	
Delta	**Pressure**	Parasitism	
Deposition	**Prokaryotes**	**Percolation**	
Dichotomous key (light,	Protein	Predation	
compound and electron	Protest	Producer*	
microscopes)	Radiation	Punnett squares	
Diffusion	Reflex	Pysics	
Displacement	**repetition**	**Recessive**	
empirical evidence	**Replication**	**Regeneration**	
Endocytosis	Resistance(air)	**Scientific law**	

Energy* (Kinetic, potential) erosion **Eukaryote** evaporation* evidence Exocytosis family Fermentation Fertilization Force* Friction* Gamete Genus Global warming Gravity* Greenhouse gas Heat **Heterotrophs** **Homeostasis** Hormone reproduction* Humidity* Hydrosphere **hypothesis** Immunity inference* Interphase interpretation Ionosphere Jet stream **Kingdom**	rock rock cycle **scientific law** scientific model Species species Speed* Sperm ovum Spongy bone Stratosphere **test variable (independent)** theory* Tissue topography transpiration* Troposphere Unicellular vaccine variable* Velocity Virus water cycle* weather weathering* Work Zygote	**Scientific models** **Scientific theory** **Test variable** Transformation **Translucent** **Transparent** Urbanization	