

Curriculum Map - Science - Science 7

Unit	Benchmarks	Understandings/Essential Questions
Cycle 1, Trimester 1		
Chemical Building Blocks <i>(updated 10/17/24)</i>	<p>SC.7.N.1.1(A) 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.</p> <p>SC.7.N.1.4(A) Identify test variables (independent variables) and outcome variables (dependent variables) in an experiment.</p> <p>SC.7.N.3.1(A) Recognize and explain the difference between theories and laws and give several examples of scientific theories and the evidence that supports them.</p> <p>SC.7.P.11.1(A) Recognize that adding heat to or removing heat from a system may result in a temperature change and possibly a change of state.</p> <p>SC.7.P.11.2(A) Investigate and describe the transformation of energy from one form to another.</p> <p>SC.7.P.11.4(A) Observe and describe that heat flows in predictable ways, moving from warmer objects to cooler ones until they reach the same temperature.</p> <p>SC.8.P.8.1(A) Explore the scientific theory of atoms (also known as atomic theory) by using models to explain the motion of particles in solids, liquids, and gases.</p> <p>SC.8.P.8.3(A) Explore and describe the densities of various materials through measurement of their masses and volumes.</p> <p>SC.8.P.8.6(A) Recognize that elements are grouped in the periodic table according to similarities of their properties.</p> <p>SC.8.P.8.7(A) Explore the scientific theory of atoms (also known as atomic theory) by recognizing that atoms are the smallest unit of an element and are composed of sub-atomic particles (electrons surrounding a nucleus containing protons and neutrons).</p> <p>SC.8.P.8.8(A) Identify basic examples of and compare and classify the properties of compounds, including acids, bases, and salts.</p> <p>SC.8.P.8.9(A) Distinguish among mixtures (including solutions) and pure substances.</p> <p>SC.8.P.9.2(A) Differentiate between physical changes and chemical changes.</p> <p>SC.5.P.8.1(I) Compare and contrast the basic properties of solids, liquids, and gases, such as mass, volume, color, texture, and temperature.</p> <p>SC.5.P.8.3(I) Demonstrate and explain that mixtures of solids can be separated based on observable properties of their parts such as particle size, shape, color, and magnetic attraction.</p> <p>SC.5.P.8.4(I) Explore the scientific theory of atoms (also called atomic theory) by recognizing that all matter is composed of parts that are too small to be seen without magnification.</p> <p>SC.5.P.9.1(I) Investigate and describe that many physical and chemical changes are affected by temperature.</p> <p>SC.7.N.1.2(I) Differentiate replication (by others) from repetition (multiple trials).</p> <p>SC.7.N.1.3(I) 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.</p> <p>SC.7.N.1.6(I) Explain that empirical evidence is the cumulative body of observations of a natural phenomenon on which scientific explanations are based.</p> <p>SC.7.N.1.7(I) Explain that scientific knowledge is the result of a great deal of debate and confirmation within the science community.</p> <p>SC.7.N.2.1(I) Identify an instance from the history of science in which scientific knowledge has changed when new evidence or new interpretations are encountered.</p> <p>SC.7.P.11.3(I) Cite evidence to explain that energy cannot be created nor destroyed, only changed from one form to another.</p> <p>SC.8.P.8.4(I) Classify and compare substances on the basis of characteristic physical properties that can be demonstrated or measured; for example, density, thermal or electrical conductivity, solubility, magnetic properties, melting and boiling points, and know that these properties are independent of the amount of the sample.</p> <p>SC.8.P.8.5(I) Recognize that there are a finite number of elements and that their atoms combine in a multitude of ways to produce compounds that make up all of the living and nonliving things that we encounter.</p> <p>SC.8.P.9.1(I) Explore the Law of Conservation of Mass by demonstrating and concluding that mass is conserved when substances undergo physical and chemical changes.</p>	

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	SC.8.P.9.3(I) Investigate and describe how temperature influences chemical changes.	
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Cycle 1 Trimester 2		
Genetics <i>(updated 11/28/23)</i>	<p>SC.7.L.16.1(A) 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.</p> <p>SC.7.L.16.2(A) Determine the probabilities for genotype and phenotype combinations using Punnett Squares and pedigrees.</p> <p>SC.7.L.16.3(A) Compare and contrast the general processes of sexual reproduction requiring meiosis and asexual reproduction requiring mitosis.</p> <p>SC.7.L.16.4(A) Recognize and explore the impact of biotechnology (cloning, genetic engineering, artificial selection) on the individual, society and the environment.</p> <p>SC.7.N.1.1(A) 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.</p> <p>SC.7.N.1.3(A) 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.</p> <p>SC.7.N.1.4(A) Identify test variables (independent variables) and outcome variables (dependent variables) in an experiment.</p> <p>SC.7.N.3.1(A) Recognize and explain the difference between theories and laws and give several examples of scientific theories and the evidence that supports them.</p> <p>SC.7.N.1.2(I) Differentiate replication (by others) from repetition (multiple trials).</p> <p>SC.7.N.1.5(I) Describe the methods used in the pursuit of a scientific explanation as seen in different fields of science such as biology, geology, and physics.</p> <p>SC.7.N.1.7(I) Explain that scientific knowledge is the result of a great deal of debate and confirmation within the science community.</p> <p>SC.7.N.2.1(I) Identify an instance from the history of science in which scientific knowledge has changed when new evidence or new interpretations are encountered.</p>	<ul style="list-style-type: none"> • Cells have structure and function • Body systems are interdependent • Balance and harmony of the systems is essential for good health • Food, environment, and genetics can all influence your health • Genetics has basic principles • The human body is structured so as to function as an efficient machine
Unit	Benchmarks	Understandings/Essential Questions
Cycle 1 Trimester 3		
Human Biology and Health <i>(updated 11/28/23)</i>	<p>SC.6.L.14.2(A) Investigate and explain the components of the scientific theory of cells (cell theory): all organisms are composed of cells (single-celled or multi-celled), all cells come from pre-existing cells, and cells are the basic unit of life.</p> <p>SC.6.L.14.3(A) Recognize and explore how cells of all organisms undergo similar processes to maintain homeostasis, including extracting energy from food, getting rid of waste, and reproducing.</p> <p>SC.6.L.14.5(A) Identify and investigate the general functions of the major systems of the human body (digestive, respiratory, circulatory, reproductive, excretory, immune, nervous, and musculoskeletal) and describe ways these systems interact with each other to maintain homeostasis.</p> <p>SC.7.N.1.1(A) 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.</p> <p>SC.7.N.1.3(A) 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.</p> <p>SC.7.N.1.4(A) Identify test variables (independent variables) and outcome variables (dependent variables) in an experiment.</p> <p>SC.8.L.18.1(A) Describe and investigate the process of photosynthesis, such as the roles of light, carbon dioxide, water and chlorophyll; production of food; release of oxygen.</p> <p>SC.8.L.18.2(A) Describe and investigate how cellular respiration breaks down food to provide energy and releases carbon dioxide.</p> <p>SC.5.L.14.1(I) Identify the organs in the human body and describe their functions, including the skin, brain, heart, lungs, stomach, liver, intestines, pancreas, muscles and skeleton, reproductive organs, kidneys, bladder, and sensory organs.</p> <p>SC.5.L.14.2(I) Compare and contrast the function of organs and other physical structures of plants and animals, including humans, for example: some</p>	<ul style="list-style-type: none"> • Living things are composed of cells serving specific purposes • Body systems are interdependent • Balance and harmony of the systems are essential for good health • Food, environment, and genetics can all influence you health • The human body is structured so as to function as an efficient machine

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	<p>animals have skeletons for support -- some with internal skeletons others with exoskeletons -- while some plants have stems for support.</p> <p>SC.6.L.14.4(I) Compare and contrast the structure and function of major organelles of plant and animal cells, including cell wall, cell membrane, nucleus, cytoplasm, chloroplasts, mitochondria, and vacuoles.</p> <p>SC.7.N.1.2(I) Differentiate replication (by others) from repetition (multiple trials).</p> <p>SC.7.N.1.5(I) Describe the methods used in the pursuit of a scientific explanation as seen in different fields of science such as biology, geology, and physics.</p> <p>SC.7.N.1.6(I) Explain that empirical evidence is the cumulative body of observations of a natural phenomenon on which scientific explanations are based.</p> <p>SC.7.N.1.7(I) Explain that scientific knowledge is the result of a great deal of debate and confirmation within the science community.</p> <p>SC.7.N.2.1(I) Identify an instance from the history of science in which scientific knowledge has changed when new evidence or new interpretations are encountered.</p> <p>SC.7.N.3.1(I) Recognize and explain the difference between theories and laws and give several examples of scientific theories and the evidence that supports them.</p> <p>SC.7.N.3.2(I) Identify the benefits and limitations of the use of scientific models.</p> <p>SC.8.L.18.3(I) Construct a scientific model of the carbon cycle to show how matter and energy are continuously transferred within and between organisms and their physical environment.</p> <p>SC.8.L.18.4(I) Cite evidence that living systems follow the Laws of Conservation of Mass and Energy.</p>	
Unit	Benchmarks	Understandings/Essential Questions
Cycle 2 Trimester 1		
<p>Motion, Forces, and Energy</p> <p><i>(updated 8/7/24)</i></p>	<p>SC.5.P.10.1(A) Investigate and describe some basic forms of energy, including light, heat, sound, electrical, chemical, and mechanical.</p> <p>SC.5.P.10.2(A) Investigate and explain that energy has the ability to cause motion or create change.</p> <p>SC.5.P.13.1(A) Identify familiar forces that cause objects to move, such as pushes or pulls, including gravity acting on falling objects.</p> <p>SC.5.P.13.2(A) Investigate and describe that the greater the force applied to it, the greater the change in motion of a given object.</p> <p>SC.5.P.13.3(A) Investigate and describe that the more mass an object has, the less effect a given force will have on the object's motion.</p> <p>SC.5.P.13.4(A) Investigate and explain that when a force is applied to an object but it does not move, it is because another opposing force is being applied by something in the environment so that the forces are balanced.</p> <p>SC.6.P.11.1(A) Explore the Law of Conservation of Energy by differentiating between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa.</p> <p>SC.6.P.12.1(A) Measure and graph distance versus time for an object moving at a constant speed. Interpret this relationship.</p> <p>SC.6.P.13.2(A) Explore the Law of Gravity by recognizing that every object exerts gravitational force on every other object and that the force depends on how much mass the objects have and how far apart they are.</p> <p>SC.6.P.13.3(A) Investigate and describe that an unbalanced force acting on an object changes its speed, or direction of motion, or both.</p> <p>SC.7.N.1.1(A) 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.</p> <p>SC.7.N.1.4(A) Identify test variables (independent variables) and outcome variables (dependent variables) in an experiment.</p> <p>SC.7.N.3.1(A) Recognize and explain the difference between theories and laws and give several examples of scientific theories and the evidence that supports them.</p> <p>SC.7.P.11.2(A) Investigate and describe the transformation of energy from one form to another.</p> <p>SC.7.P.11.3(A) Cite evidence to explain that energy cannot be created nor destroyed, only changed from one form to another.</p> <p>SC.8.L.18.4(A) Cite evidence that living systems follow the Laws of Conservation of Mass and Energy.</p> <p>SC.8.P.8.2(A) Differentiate between weight and mass recognizing that weight is the amount of gravitational pull on an object and is distinct from, though</p>	

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	<p>proportional to, mass.</p> <p>SC.6.P.13.1(I) Investigate and describe types of forces including contact forces and forces acting at a distance, such as electrical, magnetic, and gravitational.</p> <p>SC.7.N.1.2(I) Differentiate replication (by others) from repetition (multiple trials).</p> <p>SC.7.N.1.3(I) 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.</p> <p>SC.7.N.1.5(I) Describe the methods used in the pursuit of a scientific explanation as seen in different fields of science such as biology, geology, and physics.</p> <p>SC.7.N.1.6(I) Explain that empirical evidence is the cumulative body of observations of a natural phenomenon on which scientific explanations are based.</p> <p>SC.7.N.1.7(I) Explain that scientific knowledge is the result of a great deal of debate and confirmation within the science community.</p> <p>SC.7.N.2.1(I) Identify an instance from the history of science in which scientific knowledge has changed when new evidence or new interpretations are encountered.</p> <p>SC.7.N.3.2(I) Identify the benefits and limitations of the use of scientific models.</p> <p>SC.8.P.9.1(I) Explore the Law of Conservation of Mass by demonstrating and concluding that mass is conserved when substances undergo physical and chemical changes.</p>	
Unit	Benchmarks	Understandings/Essential Questions
Cycle 2 Trimester 2		
<p>Electricity and Magnetism</p> <p><i>(updated 6/24/24)</i></p>	<p>SC.5.P.10.1(A) Investigate and describe some basic forms of energy, including light, heat, sound, electrical, chemical, and mechanical.</p> <p>SC.5.P.10.4(A) Investigate and explain that electrical energy can be transformed into heat, light, and sound energy, as well as the energy of motion.</p> <p>SC.5.P.11.1(A) Investigate and illustrate the fact that the flow of electricity requires a closed circuit (a complete loop).</p> <p>SC.5.P.11.2(A) Identify and classify materials that conduct electricity and materials that do not.</p> <p>SC.7.P.11.2(A) Investigate and describe the transformation of energy from one form to another.</p> <p>SC.7.P.11.3(A) Cite evidence to explain that energy cannot be created nor destroyed, only changed from one form to another.</p> <p>SC.8.P.8.3(A) Explore and describe the densities of various materials through measurement of their masses and volumes.</p> <p>SC.8.P.8.4(A) Classify and compare substances on the basis of characteristic physical properties that can be demonstrated or measured; for example, density, thermal or electrical conductivity, solubility, magnetic properties, melting and boiling points, and know that these properties are independent of the amount of the sample.</p> <p>SC.7.N.1.1(I) 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.</p> <p>SC.7.N.1.2(I) Differentiate replication (by others) from repetition (multiple trials).</p> <p>SC.7.N.1.3(I) 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.</p> <p>SC.7.N.1.4(I) Identify test variables (independent variables) and outcome variables (dependent variables) in an experiment.</p> <p>SC.7.N.1.5(I) Describe the methods used in the pursuit of a scientific explanation as seen in different fields of science such as biology, geology, and physics.</p> <p>SC.7.N.1.6(I) Explain that empirical evidence is the cumulative body of observations of a natural phenomenon on which scientific explanations are based.</p> <p>SC.7.N.1.7(I) Explain that scientific knowledge is the result of a great deal of debate and confirmation within the science community.</p> <p>SC.7.N.2.1(I) Identify an instance from the history of science in which scientific knowledge has changed when new evidence or new interpretations are encountered.</p> <p>SC.7.N.3.1(I) Recognize and explain the difference between theories and laws and give several examples of scientific theories and the evidence that</p>	

