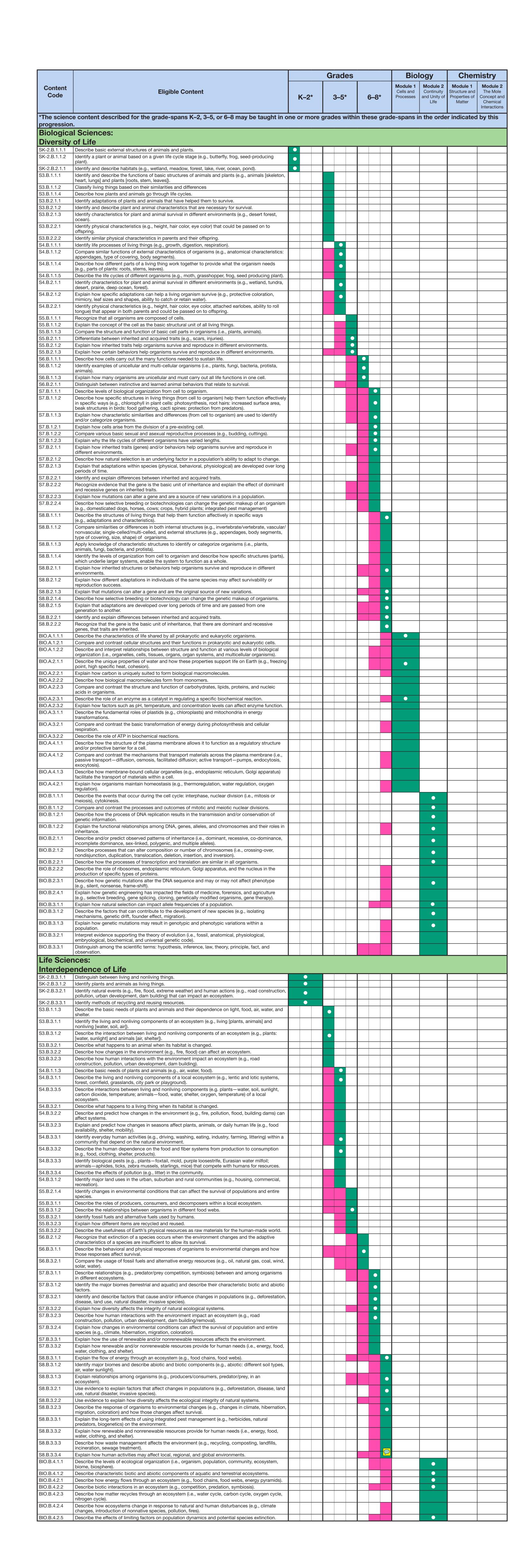
## Science Learning Progressions

Contant		Grades					Bio Module 1	Module 2	Chen Module 1	nistry Module 2
Content Code	Eligible Content	K-2*	;	3–5	*	6–8*	Cells and Processes	Continuity and Unity of Life	Structure and	The Mole Concept ar Chemical
*The science	e content described for the grade-spans K–2, 3–5, or 6–8 may be taught in o	ne or more	grad	les v	withi	n these grad	e-spans	in the orde	er indicated	Interaction
rogression			9: 0: 0:							
	nd Habits of Mind  Identify a scientific fact as something that can be observed using the five senses.	1								
K-2.A.2.1.1	Understand that making a change to an investigation may change the outcome(s) of the investigation.	•								
K-2.A.2.1.2 K-2.A.2.2.1	Describe outcomes of an investigation.  Identify simple tools that can be used in an investigation (e.g., measuring cup, hand lens, ruler, balance scale, thermometer).	•								
3.A.1.1.1 3.A.2.1.1	Distinguish between fact and opinion.  Identify the variables in a simple investigation.									
3.A.2.1.2 3.A.2.1.3	Make predictions based on observations.  Generate questions about objects, organisms, or events that can be answered through scientific									
3.A.2.2.1	investigations.  Identify appropriate tools or instruments for specific tasks, and describe the information they provide (i.e., measuring [length—ruler; mass—balance scale] and making observations [hand lenses—very		•							
4.A.1.1.1	small objects]).  Distinguish between a scientific fact and an opinion, providing clear explanations that connect observations and results (e.g., a scientific act can be supported through making observations).									
4.A.1.3.1 4.A.1.3.2	Observe and record change by using time and measurement.  Describe relative size, distance, or motion.									
4.A.1.3.3 4.A.1.3.4	Observe and describe the change to objects caused by heat, cold, or light.  Explain what happens to a living organism when its food supply, access to water, shelter, or space is									
4.A.1.3.5	changed (e.g., they might die, migrate, change behavior, eat something else).  Provide examples, predict, or describe how everyday human activities (e.g., solid waste production, food production and consumption, transportation, water consumption, energy production and use)									
4.A.2.1.1	may change the environment.  Generate questions about objects, organisms, or events that can be answered through scientific investigations.			•						
4.A.2.1.2 4.A.2.1.3	Design and describe an investigation (a fair test) to test one variable.  Observe a natural phenomenon (e.g., weather changes, length of daylight/night, movement of			•						
4.A.2.1.4	shadows, animal migrations, growth of plants), record observations, and then make a prediction based on those observations.  State a conclusion that is consistent with the information/data.									
4.A.2.2.1	Identify appropriate tools or instruments for specific tasks and describe the information they can provide (e.g., measuring: length-ruler, mass-balance scale, volume-beaker, temperature-thermometer; making observations: hand lens, binoculars, telescope).			•						
5.A.1.1.1	Explain how certain questions can be answered through scientific inquiry and/or technological design (e.g., Investigate to find out if all clay or foil boats designs react the same when filled with									
55.A.1.1.2	paperclips).  Explain how observations and/or experimental results are used to support inferences and claims about an investigation or relationship (e.g., Make a claim based on information on a graph).									
5.A.1.1.3 5.A.2.1.1	Describe how explanations, predictions, and models are developed using evidence.  Design a simple, controlled experiment (fair test) identifying the independent and dependent veriables, will be measured and which variables will be held constant.									
	variables, how the dependent variable will be measured and which variables will be held constant (e.g., relate the effect of variables [mass, release height, length of string] to number of swings of a pendulum, investigate the relationships among variables in paper airplane designs).									
5.A.2.1.2 5.A.2.2.1	Describe relationships among variables through interpretation of data and observations (i.e., make predictions for the outcome of a controlled experiment using data tables and graphs).  Describe the appropriate use of instruments and scales to accurately measure time, mass, distance,									
	volume, and temperature safely under a variety of conditions (e.g., use a thermometer to observe and compare the interaction of food coloring in water at different temperatures).									
6.A.1.1.2	Explain how certain questions can be answered through scientific inquiry and/or technological design (e.g., consumer product testing, common usage of simple machines, modern inventions).  Use evidence to support inferences and claims about an investigation or relationship (e.g., common usage of simple machines)		+						<u> </u>	
6.A.1.1.3	usage of simple machines).  Predict the outcome of an experiment based on previously collected data.		+							
6.A.1.2.1 6.A.2.1.1 7.A.1.1.1	Use evidence, observations, or explanations to make inferences about change in systems over time.  Use evidence, observations, or a variety of scales to describe relationships.  Distinguish between a scientific theory and a general opinion, explaining how a theory is supported		+							
7.A.1.1.2	with evidence.  Develop questions that can be answered through scientific inquiry and/or technological design.		+							
7.A.1.1.3 7.A.1.1.4 7.A.2.1.1	Use evidence such as observations or experimental results to support inferences.  Use evidence to develop descriptions, explanations, and models.  Use evidence from investigations to clearly describe relationships and communicate and support		+							
7.A.2.1.1 7.A.2.2.1	conclusions.  Describe the safe and appropriate use of instruments and scales to accurately and safely make		+							
7.A.2.2.2 8.A.1.1.2	measurements under variety of conditions.  Apply measurement systems to record and interpret observations under a variety of conditions.  Distinguish between a scientific theory and an opinion, explaining how a theory is supported with		+							
8.A.1.1.3	evidence, or how new data/ information may change existing theories and practice.  Use evidence, such as observations or experimental results, to support inferences about a		-							
8.A.1.1.4 8.A.1.2.4	relationship.  Develop descriptions, explanations, predictions, and models using evidence.  Identify environmental issues and explain their potential long-term health effects (e.g., pollution, pest									
8.A.1.3.1	controls, vaccinations).  Use ratio to describe change (e.g., percents, parts per million, grams per cubic centimeter).				Σ					
8.A.2.1.1 B.A.2.1.2	Use evidence, observations, or a variety of scales (e.g., time, mass, distance, volume, temperature) to describe relationships.  Use space/time relationships, define concepts operationally, raise testable questions, or formulate									
3.A.2.1.3	hypotheses.  Design a controlled experiment by specifying how the independent variables will be manipulated,									
8.A.2.1.4	how the dependent variable will be measured, and which variables will be held constant.  Interpret data/observations; develop relationships among variables based on data/observations to design models as solutions.									
8.A.2.1.5 8.A.2.2.1	Use evidence from investigations to clearly communicate and support conclusions.  Describe the appropriate use of instruments and scales to accurately measure time, mass, distance,									
8.A.2.2.2	volume, or temperature safely under a variety of conditions.  Apply appropriate measurement systems (e.g., time, mass, distance, volume, temperature) to record and interpret observations under varying conditions.									
88.A.3.3.1	Explain how certain questions can be answered through scientific inquiry and/or technological design.									
_	re of Science: Patterns, and Models									
SK-2.A.3.1.1 S3.A.3.1.1	Describe a system as being made of multiple parts that work together.  Classify systems as either human-made or natural (e.g., human-made systems [balancing systems, tops, wheel and axle systems, pencil sharpeners from manual to electric] and natural systems									
3.A.3.1.2	[plants, animals, water cycle, stream]).  Identify change in natural or human-made systems.		•							
33.A.3.2.1 54.A.3.1.4	Identify what models represent (e.g., simple maps showing mountains, valleys, lakes, and rivers; dioramas).  Categorize systems as either natural or human-made (e.g., ballpoint pens, simple electrical circuits,		•							
34.A.3.1.3	plant anatomy, water cycle).  Explain a relationship between the living and nonliving components in a system (e.g., food web, terrarium, bicycle).			•						
64.A.3.1.2	Categorize the parts of an ecosystem as either living or non-living and describe their roles in the system.			•						
64.A.3.1.1 64.A.3.2.1	Identify the parts of the food and fiber systems as they relate to agricultural products from the source to the consumer.  Identify what different models represent (e.g., maps show physical features, directions, distances;			•						
	globes represent Earth; drawings of watersheds depict terrain; dioramas show ecosystems; concept maps show relationships of ideas).									
64.A.3.2.2 64.A.3.2.3	Use models to make observations to explain how systems work (e.g., water cycle, sun-Earth-moon system).  Use appropriate, simple modeling tools and techniques to describe or illustrate a system (e.g., two			•						
64.A.3.3.1	cans and string to model a communications system, terrarium to model an ecosystem).  Identify and describe observable patterns (e.g., growth patterns in plants, weather, water cycle).				<u> </u>					
54.A.3.3.2 55.A.3.1.1	Predict future conditions/events based on observable patterns (e.g., day/night, seasons, sunrise/sunset, lunar phases).  Make predictions based on patterns in natural systems (e.g., phases of the moon, time [day, month,			•						
55.A.3.2.1	and year], weather, seasons).  Describe how models are used to better understand the relationships in natural systems (e.g., water cycle, Sun-Earth-Moon, ecosystems, observe and draw a diagram to show the effects of flowing									
66.A.1.2.2	water in a watershed).  Identify variables that cause change in natural or human-made systems.									
66.A.2.1.2 66.A.3.1.1	Identify variables that cause change in natural or human-made systems.  Describe a system as a group of related parts with specific roles that work together to achieve an observed result.					•				
6.A.3.1.2	Explain how components of natural and human-made systems play different roles in a working system.									
6.A.3.2.1 7.A.1.3.1	Describe how scientists use models to explore relationships and make predictions about natural systems (e.g., weather conditions, the solar system).  Describe how variables can cause changes in a system over time.									
7.A.1.3.2	Use evidence, observations, or explanations to make inferences about change in systems over time (e.g., carrying capacity, succession, fossil evidence in the geologic time scale).					•				
7.A.3.1.1 7.A.3.1.2	Describe a system (e.g., ecosystem, circulatory system, agricultural system) as a group of related parts with specific roles that work together to achieve an observed result.  Explain concept of order in a system (e.g., first to last manufacturing steps, trophic levels; simple to		1			•				
7.A.3.1.3	complex: levels of biological organization from cell to organism).  Distinguish among system inputs, system processes, system outputs, and system feedback.		+							
7.A.3.1.4 7.A.3.2.1	Identify examples of open- and closed-looped systems.  Make inferences based on scientific models (e.g., charts, graphs, diagrams).  Describe how engineers use models to develop new and improved technologies to improve		+			•				
7.A.3.2.2 7.A.3.3.1	Describe how engineers use models to develop new and improved technologies to improve scientific study and/or human life.  Describe patterns as repeated processes or recurring elements in natural and human-made		+							
8.A.1.1.1	systems.  Identify and describe patterns as repeated processes or recurring elements in human-made systems (e.g., triangles in bridges, hub and spoke system in communications and transportation systems,		+							
8.A.1.3.2	feedback controls in regulated systems).  Use evidence, observations, or explanations to make inferences about change in systems over		+							
8.A.1.3.3	time (e.g., carrying capacity, succession, population dynamics, loss of mass in chemical reactions, indicator fossils in geologic time scale) and the variables affecting these changes.  Examine systems changing over time, identifying the possible variables causing this change, and		+							
8.A.1.3.4	drawing inferences about how these variables affect this change.  Given a scenario, explain how a dynamically changing environment provides for the sustainability of living systems.		+			•				
8.A.3.1.1	Describe a system (e.g., watershed, circulatory system, heating system, agricultural system) as a group of related parts with specific roles that works together to achieve an observed result.					•				
8.A.3.1.2 8.A.3.1.3	Explain the concept of order in a system (e.g., first to last–manufacturing steps; trophic levels; simple to complex–cell, tissue, organ, organ system).  Distinguish between system inputs, system processes, system outputs, and feedback		+		ζ					
8.A.3.1.4	(e.g., physical, ecological, biological, informational).  Distinguish between open loop (e.g., energy flow, food web, open-switch) and closed loop (e.g., materials in the nitrogen and carbon cycles, closed-switch) systems.		+							
8.A.3.1.5	Explain how components of a natural and human-made system play different roles in a working system.		丰			•				
8.A.3.2.1 8.A.3.2.2	Describe how scientists use models to explore relationships in natural systems (such as an ecosystem, river system, or the solar system).  Describe how engineers use models to develop new and improved technologies to solve problems.		+							
8.A.3.2.3	Given a model showing simple cause and effect relationships in a natural system, predict results that can be used to test the assumptions in the model. (e.g., photosynthesis, water cycle, diffusion, infiltration).		1							
8.A.3.3.2	infiltration).  Describe repeating structure patterns in nature(e.g., veins in a leaf, tree rings, crystals, water waves) or periodic patterns (e.g., daily, monthly, annually).					•				
	re of Science: ments in Science and Technology									
<b>Advance</b> SK-2.A.1.1.2 SK-2.A.1.1.3	Identify examples of technology.  Describe how technology can help people (e.g., home appliances, phones, computers,	• • •								
3.A.1.1.2	transportation).  Identify examples of common technological changes past and present in the community		•						<u> </u>	
64.A.1.1.2	(e.g., energy production, transportation, communication, recycling).  Identify and describe examples of common technological changes past to present in the community (e.g., energy production, transportation, communications, agriculture, packaging materials) that have									
5.A.2.2.2	either positive or negative impacts on society or the environment.  Explain how technology extends and enhances human abilities for specific purposes (e.g., use hand lens to examine crystals in evaporation dishes, use graduated cylinders to measure the amount of									
6.A.2.2.1	water used in a controlled plant experiment).  Describe ways technology extends and enhances human abilities for specific purposes (e.g., make					•				
7.A.1.2.1	observations of cells with a microscope, planets with a telescope).  Describe the positive and negative effects (both intended and unintended) of scientific results or technological developments.									
7.A.2.1.2 7.A.2.2.3	Identify a design flaw in a simple technological system and devise possible working solutions.  Describe ways technology is used to enhance scientific study and/or human life.									
8.A.1.2.1	Describe the positive and negative, intended and unintended, effects of specific scientific results or technological developments.(e.g., air/space travel, genetic engineering, nuclear fission/fusion, artificial intelligence, lasers, organ transplants).					•				
8.A.1.2.2	Explain society's standard of living in terms of technological advancements and their impact on agriculture. (e.g., transportation, processing, production, storage)									
8.A.1.2.3 8.A.2.1.6	Describe fundamental scientific or technological concepts that could solve practical problems. (e.g., Newton's Laws of motion, Mendelian genetics, mechanical advantage).  Identify a design flaw in a simple technological system and devise possible working solutions.		_							
8.A.2.2.3	Describe ways technology extends and enhances human abilities for specific purposes	ı	1					1	ſ	



Content Code	Eligible Content		Grad 3–5	Т	6-8*	Module 1 Cells and Processes	Module 2 Continuity and Unity of Life	Module 1 Structure and Properties of Matter	
progression		ne or more	grades v	within t	hese grad	ı de-spans i	n the orde	r indicated	
Matter	Sciences:								
SK-2.C.1.2.1 S3.C.1.1.1	Describe basic changes to properties of matter (e.g., formation of mixtures and solutions, baking and cooking, freezing, heating, evaporating, melting).  Describe matter in terms of its observable properties (e.g., weight, mass, shape, size, color, texture,	•							<u> </u>
S3.C.1.1.2	and state).  Classify matter using observable physical properties. (e.g., weight, mass, shape, size, color, texture, and state).								
S3.C.1.1.3 S3.C.1.1.4	Classify a substance as a solid, a liquid, or a gas.  Recognize and identify how water goes through phase changes (i.e., evaporation, condensation,								
S3.C.1.1.5	freezing, and melting).  Describe how the properties of matter can be changed (e.g., heating, cooling, physical weathering).								
S4.C.1.1.1 S4.C.1.1.2	Use physical properties (e.g., mass, shape, size, volume, color, texture, magnetic property, state [solid, liquid, or gas] conductivity [electrical or heat]) to describe matter.  Categorize/group objects using physical characteristics.			Н					
S5.C.1.1.2 S5.C.1.2.1	Differentiate between volume and mass.  Describe how water changes from one state to another.			0					
S5.C.1.2.2 S5.C.3.1.1	Identify differences between chemical and physical changes of matter.  Differentiate between the mass and weight of an object.			•					
S6.C.1.1.1 S6.C.1.1.2	Describe how characteristic physical properties of matter can be used to distinguish one substance from another (e.g., boiling point, freezing/melting points).  Explain that materials are characterized by having a specific amount of mass in each unit of volume			1					
S6.C.1.2.1	(density).  Describe how water changes from one state to another.								
S6.C.1.2.2 S7.C.1.1.1	Identify differences between chemical and physical changes of matter.  Use characteristic physical or chemical properties of matter to distinguish one substance from another (e.g., density, freezing/melting points, solubility, ability to rust).								
S7.C.1.1.2 S7.C.1.1.3	Recognize that the atom is the basic building block for all matter.  Explain the differences between elements, compounds, and mixtures.								
S7.C.1.1.4 S7.C.1.2.1	Describe the relationship between mass and volume as density.  Identify the reactants and products of simple chemical reactions (e.g., photosynthesis, cellular respiration).								
S8.C.1.1.1 S8.C.1.1.2	Explain the differences among elements, compounds, and mixtures.  Use characteristic physical or chemical properties to distinguish one substance from another								
S8.C.1.1.3	(e.g., density, thermal expansion/contraction, freezing/melting points, streak test).  Identify and describe reactants and products of simple chemical reactions.								
CHEM.A.1.1.2	Classify physical or chemical changes within a system in terms of matter and/or energy.  Classify observations as qualitative and/or quantitative.								
CHEM.A.1.1.3 CHEM.A.1.1.4 CHEM.A.1.1.5	Utilize significant figures to communicate the uncertainty in a quantitative observation.  Relate the physical properties of matter to its atomic or molecular structure.  Apply a systematic set of rules [IUPAC] for naming compounds and writing chemical formulas (e.g.,							•	
CHEM.A.1.2.1	binary covalent, binary ionic, ionic compounds containing polyatomic ions).  Compare and contrast properties of solutions containing ionic or molecular solutes (e.g., dissolving, dissociating).					-		•	
CHEM.A.1.2.2	Differentiate between homogeneous and heterogeneous mixtures (e.g., how such mixtures can be separated).							•	
CHEM.A.1.2.3 CHEM.A.1.2.4	Describe how factors (e.g., temperature, concentration, surface area) can affect solubility.  Describe various ways that concentration can be expressed and calculated (e.g., molarity, percent by mass, percent by volume).							•	
CHEM.A.1.2.5 CHEM.A.2.1.1	Describe how chemical bonding can affect whether a substance dissolves in a given liquid.  Describe the evolution of atomic theory leading to the current model of the atom based on the works							•	
CHEM.A.2.1.2	of Dalton, Thomson, Rutherford, and Bohr.  Differentiate between the mass number of an isotope and the average atomic mass of an element.							•	
CHEM.A.2.2.1 CHEM.A.2.2.2	Predict the ground state electronic configuration and/or orbital diagram for a given atom or ion.  Predict characteristics of an atom or an ion based on its location on the periodic table (e.g., number of valence electrons, potential types of bond formations, reactivity).							•	
	Explain the relationship between the electron configuration and the atomic structure of a given atom or ion (e.g., energy levels and/or orbitals with electrons, distribution of electrons in orbitals, shapes of orbitals).								
CHEM.A.2.2.4 CHEM.A.2.3.1	of orbitals).  Relate the existence of quantized energy levels to atomic emission spectra.  Explain how the periodicity of chemical properties led to the arrangement of elements on the								
CHEM.A.2.3.2	periodic table.  Compare and/or predict the properties (e.g., electron affinity, ionization energy, chemical reactivity,							•	
	electronegativity, atomic radius) of selected elements by using their locations on the periodic table and known trends.  Apply the mole concept to representative particles (e.g., counting, determining mass of atoms, ions,							•	
CHEM.B.1.2.1	molecules, and/or formula units).  Determine the empirical and molecular formulas of compounds.								
CHEM.B.1.2.2 CHEM.B.1.2.3	Apply the law of definite proportions to the classification of elements and compounds as pure substances.  Relate the percent composition and mass of each element present in a compound.								
CHEM.B.1.3.1 CHEM.B.1.3.2	Explain how atoms combine to form compounds through ionic and covalent bonding.  Classify a bond as being polar covalent, non-polar covalent, or ionic.								
CHEM.B.1.3.3 CHEM.B.1.4.1 CHEM.B.1.4.2	Use illustrations to predict the polarity of a molecule.  Recognize and describe different types of models that can be used to illustrate the bonds that hold atoms together in a compound (e.g., computer models, ball and stick models, graphical models, solid-sphere models, structural formulas, skeletal formulas, Lewis dot structures).  Utilize Lewis dot diagrams to predict the structure and bonding in simple compounds.								
CHEM.B.2.1.1 CHEM.B.2.1.2	Describe the roles of limiting and excess reactants in chemical reactions.  Use stoichiometric relationships to calculate the amounts of reactants and products involved in a chemical reaction.  Classify reactions as synthesis, decomposition, single replacement, double replacement, or								
CHEM.B.2.2.2	combustion.  Predict products of simple chemical reactions (e.g., synthesis, decomposition, single replacement, double replacement, combustion).								
CHEM.B.2.2.1	Balance chemical equations by applying the Law of Conservation of Matter.  Predict the amounts of reactants and products involved in a chemical reaction using molar volume of a gas at STP.								
CHEM.B.2.1.4	Utilize mathematical relationships to predict changes in the number of particles, the temperature, the pressure, and the volume in a gaseous system (i.e., Boyle's Law, Charles' Law, the Combined Gas								
	Law, and the Ideal Gas Law, Dalton's Law of Partial Pressure).  Sciences:						l		
<b>Energy</b> S3.C.2.1.1	Identify basic forms and sources of energy (e.g., sun, heat, light, sound).		•						
S3.C.2.1.2 S3.C.2.1.3	Identify simple transformations of energy (e.g., eating food to get energy, rubbing hands together to create heat).  Identify characteristics of sound (i.e., pitch, loudness).		•			<u> </u>			
S4.C.2.1.1 S4.C.2.1.2	Identify energy forms and examples (e.g., light, heat, stored, motion, electrical).  Describe the flow of energy through an object or system (e.g., feeling radiant heat from a light bulb,			$\Box$					
S4.C.2.1.3	eating food to get energy, using a battery to light a bulb or run a fan).  Recognize or illustrate simple direct current series and parallel circuits composed of batteries, light bulbs (or other common loads), wire, and on/off- switches.								
S4.C.2.1.4 S5.C.1.1.1	Identify characteristics of sound (e.g., pitch, loudness, echoes).  Identify characteristic properties of matter that are independent of the mass and volume.			•					
S5.C.2.1.1 S5.C.2.1.2	Describe how energy exists in many forms (e.g., electrical, mechanical, chemical, heat, light, sound) and can be transformed within a system.  Describe how heat energy is usually a byproduct of an energy transformation.			•					
S5.C.2.1.3 S5.C.2.1.4	Distinguish between kinetic and potential energy.  Explain that energy is conserved.								
S6.C.2.1.1 S6.C.2.1.2	Describe how heat moves in predictable ways from warmer objects to cooler ones, until they reach the same temperature.								
S6.C.2.1.3	Describe the effect of heat on particle motion during phase changes.  Compare various energy sources (i.e., oil, coal, natural gas, solar, wind, and moving water) and describe how these energy sources are transformed into useful forms of energy.								
S7.C.1.2.2 S7.C.2.1.1	Compare and contrast the behavior of particle motion in solids, liquids, and gasses.  Describe how energy is obtained and used by organisms throughout their lives.				•				
\$7.C.2.1.2 \$7.C.2.1.3 \$8.C.2.1.1	Describe how energy is transferred and conserved through a closed system.  Describe energy transformations within an ecosystem.  Distinguish among forms of energy (e.g., electrical, mechanical, chemical, heat, light, sound, nuclear)								
S8.C.2.1.1 S8.C.2.1.2	and sources of energy (i.e., renewable and nonrenewable energy)  Explain how heat is transferred from one place to another through convection, conduction, or				•				
S8.C.2.1.3	radiation.  Describe how one form of energy (e.g., electrical, mechanical, chemical, heat, light, sound, nuclear) can be converted into a different form of energy.				•				
S8.C.2.2.1 S8.C.2.2.2	Describe the sun as a major source of energy that impacts on the environment.  Compare the time spans of renewability for fossil fuels and alternative fuels.								
S8.C.2.2.3 S8.C.3.1.2	Describe the waste (quantity, kind, and potential to cause environmental impacts) derived from the use of renewable and nonrenewable energy sources and their potential impact on the environment.  Distinguish between kinetic and potential energy.								
Physical \$	Sciences:						1		
Force and S3.C.3.1.1	Motion   Identify and describe an object's motion (e.g., start/stop, push/pull, up/down, left/right, faster/slower, spinning).		•						
S3.C.3.1.2	Describe an object's position in terms of its relationship to another object or stationary background (e.g., behind, beside, on top of, above, below).		•						
S4.C.3.1.1 S4.C.3.1.2	Describe the position of an object by locating it relative to another object or the background (e.g., geographic direction, left, up).  Compare the relative movement of objects or describe types of motion that are evident								
S4.C.3.1.3	(e.g., bouncing ball, moving in a straight line, back and forth, merry-go-round).  Describe changes in motion caused by forces (e.g., magnetic, pushes or pulls, gravity, friction).								
S5.C.3.1.2 S5.C.3.2.1	Explain how the mass of an object resists change to motion (inertia).  Recognize that moving electric charges produce magnetic forces and moving magnets produce electric forces (Electromagnetism).								
S5.C.3.2.2 S6.C.3.1.1	Identify the variables within an electric current (i.e., voltage, current, and resistance).  Compare speed and velocity.								
S6.C.3.1.2	Explain why gravitational force depends on how much mass the objects have and the distance between them.								
S6.C.3.2.1 S6.C.3.2.2	Describe how moving electric charges produce magnetic forces and moving magnets produce electric forces.  Distinguish between gravity and electromagnetism.								
- 1	Describe the relationship among voltage, current, and resistance (Ohm's Law).								
S6.C.3.2.3 S7.C.3.1.1	Describe how unbalanced forces acting on an object change its velocity.								. —
	Describe how unbalanced forces acting on an object change its velocity.  Explain the mechanical advantages of simple machines.  Describe forces acting on an object (e.g., friction, gravity, balanced verses unbalanced).  Describe forces acting on objects (e.g., friction, gravity, balanced versus unbalanced, inertia,				•				

0			Grades	<u> </u>	Biology  Module 1 Module 2		Module 1	NISTRY Module 2
Content Code	Eligible Content	K-2*	3–5*	6–8*	Cells and Processes	Continuity	Structure and Properties of Matter	The Mole Concept an Chemical Interactions
The scienc	 ce content described for the grade-spans K-2, 3-5, or 6-8 may be taught in o n.	ne or more	l grades withi	n these grad	l de-spans i	n the orde	l er indicated	
arth & S arth	Space Sciences:							
K-2.D.1.1.1 K-2.D.1.2.1	Identify different types of Earth materials (e.g., rock, soil, sand, pebbles).  Identify Earth's natural resources.	•						
6K-2.D.1.3.1 6K-2.D.1.3.2	Identify features on Earth's surface (e.g., lakes, rivers, oceans, mountains, plains, volcanoes).  Describe natural events that alter Earth's surface (e.g., volcanic eruptions, floods, hurricanes, earthquakes).	•						
SK-2.D.2.1.1 SK-2.D.2.1.2	Identify weather variables (i.e., temperature, wind speed, wind direction, and precipitation).  Identify how weather conditions affect daily life.	•						
33.D.1.1.1 33.D.1.1.2	Recognize that rock is composed of different kinds of minerals.  Describe the composition of soil as weathered rock and decomposed organic material.							
S3.D.1.2.1 S3.D.1.2.2	Describe why certain resources are renewable and other resources are nonrenewable.  Identify and describe examples of renewable and nonrenewable resources.							
S3.D.1.2.3 S3.D.1.3.1	Describe the ways living things benefit from the uses of water resources.  Identify ways that cause Earth's surface to be constantly changing (e.g., wind and water erosion,							
S3.D.1.3.2	contraction and expansion of surfaces).  Distinguish between ways that tear down the surface of Earth and those that build up the surface				<u> </u>			
S3.D.1.3.3	(e.g., erosion, weathering).  Distinguish between slow and rapid changes to Earth's surface (e.g., tides, floods, tidal waves).							
33.D.2.1.1 33.D.2.1.2	Recognize that clouds have different characteristics that relate to different weather conditions.  Describe how weather variables (i.e., temperature, wind speed, wind direction, and precipitation) are observed and measured.							
S3.D.2.1.3	Identify appropriate instruments to study and measure weather elements (i.e. temperature (thermometer), wind direction (wind vane), wind speed (anemometer), precipitation (rain gauge).							
S3.D.3.1.1 S4.D.1.1.1	Describe how Earth rotates on its axis once every 24 hours giving rise to the cycle of night and day.  Describe how prominent Earth features in Pennsylvania (e.g., mountains, valleys, beaches, caves, sinkholes, lakes, rivers) were formed.							
S4.D.1.1.2	Identify various Earth structures (e.g., mountain, watershed, peninsula, lake, river, valley) through the use of models.							
S4.D.1.1.3 S4.D.1.2.1	Describe the composition of soil as weathered rock and decomposed organic remains.  Identify products and by-products of plants and animals for human use (e.g., food, clothing, building							
S4.D.1.2.2	materials, paper products).  Identify the types and uses of Earth materials for renewable, nonrenewable, and reusable products  (o.g., human made products; concrete paper plastics, metal, fabrics, buildings, highways)							
S4.D.1.2.3	(e.g., human-made products: concrete, paper, plastics, metal, fabrics, buildings, highways).  Recognize ways that humans benefit from the use of water resources (e.g., agriculture, energy, recreation).							
S4.D.1.3.1 S4.D.1.3.2	Describe types of freshwater and saltwater bodies (e.g., lakes, rivers, wetlands, oceans).  Explain how water goes through phase changes (i.e., evaporation, condensation, freezing, and							
S4.D.1.3.3	melting).  Describe or compare lotic systems (ponds, lakes, bays) and lentic systems (streams, creeks, rivers).							
S4.D.1.3.4 S4.D.2.1.1	Explain the role and relationship of a watershed or a wetland on water sources (e.g., water storage, groundwater recharge, water filtration, water source, water cycle).  Identify basic clouds types (cirrus, cumulus, stratus, cumulonimbus) and make connections to basic							
S4.D.2.1.1 S4.D.2.1.2	elements of weather (e.g., changes in temperature and precipitation).  Identify weather patterns from data charts or graphs of the data (e.g., temperature, wind direction,		•					
S4.D.2.1.3	wind speed, cloud types, precipitation).  Identify appropriate instruments (thermometer, rain gauge, weather vain, anemometer, barometer to							
S4.D.3.1.3	study weather and what they measure.  Describe the causes of seasonal change as it relates to the rotation of the Earth and the tilt of the Earth's axis.						<u> </u>	
S5.D.1.1.1	Differentiate between abrupt changes in Earth's surface (e.g., earthquakes, volcanoes, meteor impacts, landslides) and gradual changes in Earth's surface (e.g., lifting up of mountains, wearing							
S5.D.1.1.2	away by erosion).  Explain how geological processes observed today (e.g., erosion, changes in the composition of the				<u> </u> 		<u> </u>	
S5.D.1.2.1 S5.D.1.2.2	atmosphere, volcanic eruptions, earthquakes) are similar to those in the past.  Identify physical, chemical, and biological factors that affect water quality.  Describe the importance of wetlands in an ecosystem.							
S5.D.1.2.2 S5.D.2.1.1 S5.D.2.1.2	Explain how the cycling of water into and out of the atmosphere impacts climatic patterns.  Explain the effects of oceans and lakes on climate.							
66.D.1.1.1	Describe how soil fertility, composition, resistance to erosion, and texture are affected by many factors.							
66.D.1.1.2	Identify the three basic rock types and describe their formation (i.e., igneous: granite, basalt, obsidian, and pumice; sedimentary: limestone, sandstone, shale, and coal; metamorphic: slate,							
S6.D.2.1.1	quartzite, marble, and gneiss).  Describe cloud types and measurable factors (i.e., wind direction, temperature, barometric pressure, moisture, and precipitation) that are associated with various weather patterns.							
S6.D.2.1.2 S6.D.2.1.3	Interpret weather data to develop a weather forecast.  Explain how global patterns (jet stream water currents) influence weather in measurable terms (e.g.,							
S7.D.1.1.1	wind direction, temperature, barometric pressure, precipitation).  Identify and describe soil characteristics (e.g., particle size, porosity, and permeability) of different							
S7.D.1.1.2	biomes.  Explain how fossils are formed and how they can provide evidence about plants and animals that once lived on Earth.				<u> </u>		<u> </u>	
S7.D.1.2.1 S7.D.1.2.2	Compare and contrast the different water systems on Earth (e.g., wetland, watershed, ocean, river).  Compare and contrast biotic and abiotic features of freshwater and saltwater systems.							
S7.D.1.2.3 S7.D.2.1.1	Describe the importance of water systems on the diversity and distribution of life on Earth.  Explain the effect of wind patterns, circulation of oceans currents, atmospheric pressure and							
S7.D.2.1.2	temperature on weather.  Describe changes in atmospheric conditions associated with various weather patterns.							
S8.D.1.1.1	Explain the rock cycle as changes in the solid earth and rock types found in Pennsylvania (igneous—granite, basalt, obsidian, pumice; sedimentary—limestone, sandstone, shale, coal; and metamorphic—slate, quartzite, marble, gneiss).			•				
S8.D.1.1.2	Compare and contrast (geological processes, length of time over which change occurs, factors affecting the rate of change) different types of changes in Earth's surface (e.g., landslides,				$\bigcirc$			
S8.D.1.1.3	volcanic eruptions, earthquakes, mountain building, new land being formed, weathering, erosion, sedimentation, soil formation).							
56.D.1.1.3	Identify soil types. (i.e., humus, topsoil, subsoil, loam, loess, and parent material) and their characteristics (particle size, porosity, permeability) found in different biomes and in Pennsylvania, and explain how they formed.							
S8.D.1.1.4	Explain how fossils provide evidence about plants and animals that lived long ago throughout Pennsylvania's history (e.g., fossils provide evidence of different environments).							
S8.D.1.2.1	Describe a product's (synthetic gas produced from coal, bio-diesel produced from soybeans, ethanol produced from corn, laminated hardwood flooring produced from maple trees) transformation process from production to consumption (e.g., prospecting, propagating, growing,							
	maintaining, adapting, treating, converting, distributing, disposing) and explain the process's potential impacts on Earth's resources.							
S8.D.1.2.2	Describe potential impacts of human-made processes (e.g., manufacturing, agriculture, transportation, mining on Earth's resources, both nonliving (air, water, or earth materials) and living (plants and animals).							
S8.D.1.3.1	Describe the water cycle and the physical processes on which it depends (i.e., evaporation, condensation, precipitation, transpiration, runoff, infiltration, energy inputs, and phase changes).			•				
S8.D.1.3.2	Compare and contrast characteristics of freshwater and saltwater systems on the basis of their physical characteristics (composition, density, electrical conductivity) and their use as natural resources.			•				
S8.D.1.3.3	Distinguish among different water systems (e.g., wetland systems, ocean systems, river systems, watersheds) and describe their relationships to each other as well as to landforms.			•				
S8.D.1.3.4	Identify the physical characteristics of a stream and how these characteristics determine the types of organisms found in an aquatic environment (e.g., biological diversity, water quality, flow rate, tributaries, surrounding watershed).							
S8.D.2.1.1	Explain the impact of water systems on the local weather or the climate of a region (e.g., lake effect snow, land/ocean breezes).							
S8.D.2.1.2 S8.D.2.1.3	Identify how global patterns of atmospheric movement influence regional weather and climate.  Identify how cloud types, wind directions and barometric pressure changes are associated with							
Earth & S	weather patterns in different regions of the country.  Space Sciences:		1		1		<u> </u>	
The Universe Control of the Un	erse  Identify objects that can be observed in the day or night sky (i.e., the Moon, planets, the Sun and							
SK-2.D.3.1.2	other stars).  Describe and identify the four seasons in Pennsylvania.	•						
S3.D.3.1.2	Describe the predictable patterns of change that occur over time in the observable shape of the moon.		•					
64.D.3.1.2 64.D.3.1.1	Explain how the motion of the sun, earth, moon system relates to time (e.g., days, months, years).  Describe motions of the sun-Earth-moon system.		•					
\$5.D.3.1.1 	Describe the patterns of Earth's rotation and revolution in relation to the sun and moon (i.e., solar eclipse, phases of the moon, time).  Compare the general characteristics of the inner planets of our solar system (i.e., size, orbital path,				<u> </u>		<u> </u>	
66.D.3.1.1	surface characteristics, and moons).  Compare the size and surface features of the planets that comprise the solar system as well as the						<u> </u>	
66.D.3.1.2	objects orbiting them.  Describe how the size, composition, and surface features of the planets are influenced by their distance from the sun.				<u> </u>		<u> </u>	
37.D.3.1.1	Describe the patterns of Earth's rotation and revolution in relation to the sun and moon (i.e., solar eclipse, lunar eclipse, phases of the moon, time).			•				
37.D.3.1.2	Explain how gravity is the essential force in determining the motions of the planets and other objects in the solar system.							
67.D.3.1.3 67.D.3.1.4	Compare the properties and conditions of objects in the solar system to those of Earth.  Identify and describe instruments that are used to study the universe (e.g., telescope, probes,							
88.D.3.1.1	satellites, space observatories).  Describe patterns of Earth's movements (i.e., rotation, revolution) in relation to the moon and sun (i.e., phases, eclipses, and tides)			•				
S8.D.3.1.3	(i.e., phases, eclipses, and tides).  Compare and contrast characteristics of celestial bodies found in the solar system (e.g., planets, moons, asteroids, comets, meteors, meteoroids, meteorites, inner and outer planets).			•				
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When students are expected to demonstrate the knowledge, skills, and abilities described by an eligible content—No VMC is currently available.

When students are expected to demonstrate the knowledge, skills, and abilities described by an eligible content—VMC is currently available.

When grade appropriate instruction pertaining to an eligible content or standard should begin.

(e.g., microscope, telescope, micrometer, hydraulics, barometer).