Central York School District

Curriculum Adoption

2020/2021

7-12 – Science

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Middle School Science 101	Understand importance of lab safety within a science lab	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A
Science	Grade 7	7th Grade Science	Investigation 1 - What is Life?	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different either one cell or many different numbers and types of cells.	MS-LS1-1
Science	Grade 7	7th Grade Science	Investigation 1 - What is Life?	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe the similarities and differences of physical characteristics in diverse organisms.	3.1.7.A1
Science	Grade 7	7th Grade Science	Investigation 1 - What is Life?	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain how characteristic similarities and differences (from cell to organism) are used to identify and/or categorize organisms (Living, Nonliving, Dead, Dormant) to create an operational definition of living (All life is Aquatic at the cellular level).	3.1.7.A1.A
Science	Grade 7	7th Grade Science	Investigation 1 - What is Life?	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Compare similarities and differences in internal and external structures of organisms.	3.1.7.A1.B
Science	Grade 7	7th Grade Science	Investigation 1 - What is Life?	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Apply knowledge of characteristic structures to identify or categorize organisms (Dichotomous key)	3.1.7.A1.C
Science	Grade 7	7th Grade Science	Investigation 1 - What is Life?	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe the difference between living cells that are organisms and living cells that are not organisms (Paramecium vs Elodea).	3.1.7.A1.D
Science	Grade 7	7th Grade Science	Investigation 2 - Introduction to the Microscope	Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different either one cell or many different numbers and types of cells.	MS-LS1-1

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 3 - Microscopic Life	Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	Describe the difference between living cells that are organisms and living cells that are not organisms (Paramecium vs Elodea).	3.1.7.A1.D
Science	Grade 7	7th Grade Science	Investigation 3 - Microscopic Life	Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	Explain how the cell is the basic structural and functional unit of living things.	3.1.7.A5
Science	Grade 7	7th Grade Science	Investigation 3 - Microscopic Life	Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	Describe how specific structures in living things (from cell to organism) help them function effectively in specific ways (e.g., chlorophyll in plant cells— photosynthesis; root hairs—increased surface area; beak structures in birds— food gathering; cacti spines—protection from predators).	S7.B.1.1.2
Science	Grade 7	7th Grade Science	Investigation 3 - Microscopic Life	Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	Explain how cells arise from the division of pre-existing cells.	S7.B.1.1.2.E
Science	Grade 7	7th Grade Science	Investigation 3 - Microscopic Life	Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	Explain that cells and organisms have particular structures that underlie their function.	S7.B.1.2.1
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different either one cell or many different numbers and types of cells.	MS-LS1-1
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.	MS-LS1-2
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	MS-LS1-3
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe the similarities and differences of physical characteristics in diverse organisms.	3.1.7.A1

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Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain how characteristic similarities and differences (from cell to organism) are used to identify and/or categorize organisms (Living, Nonliving, Dead, Dormant) to create an operational definition of living (All life is Aquatic at the cellular level).	3.1.7.A1.A
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Compare similarities and differences in internal and external structures of organisms.	3.1.7.A1.B
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Apply knowledge of characteristic structures to identify or categorize organisms (Dichotomous key)	3.1.7.A1.C
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe the difference between living cells that are organisms and living cells that are not organisms (Paramecium vs Elodea).	3.1.7.A1.D
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describes how organisms obtain and use energy throughout their lives.	3.1.7.A2
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe and explain how variables can cause changes in a system over time.	3.1.7.A2.E
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain the formation, function and use of trophic levels (Rule of 10%)	3.1.7.A2.F
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe energy transformations within an ecosystem	3.1.7.A2.G
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Demonstrate the dependency of living (Biotic) components in the ecosystem on the nonliving (Abiotic) components.	3.1.7.A2.H
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain the complex, interactive relationships among members of an ecosystem (food chain, food web).	3.1.7.A2.I
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe how every activity undertaken by living organism involves expenditure of energy.	3.1.7.A2.J

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Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain the importance of the predator/prey relationship and how it maintains the balance within ecosystems.	3.1.7.A2.K
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain the role of different plant structures in early plant growth (Cotyledon, Endosperm, Seed Coat, Embryo, Roots, Root Hairs).	3.1.7.A2.L
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain how the cell is the basic structural and functional unit of living things.	3.1.7.A5
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe how specific structures in living things (from cell to organism) help them function effectively in specific ways (e.g., chlorophyll in M: Explain how cells arise from pre-existing cells.	S7.B.1.1.2
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain that cells and organisms have particular structures that underlie their function.	S7.B.1.1.2.M
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Identify the levels of organization from cell to organism.	3.1.7.A6
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain the concept of order in a system (e.g., first to last manufacturing steps; trophic levels; simple to complex—levels of biological organization from cell to organism).	S7.A.3.1.2
Science	Grade 7	7th Grade Science	Investigation 4 - The Cell	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe life processes and levels of biological organization from atom, molecules, organelle, cell, tissue, organ, organ system to complex multicellular organism.	S7.A.3.1.2.N
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	MS-LS2-4
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	MS-LS2-5

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Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	MS-ESS3-3
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	MS-ESS3-4
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	MS-ETS1-1
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	MS-ETS1-2
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain the complex interactive relationships among members of an ecosystem	4.3.7.C.01
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain how living things respond to changes in their environment	4.7.7.A.01
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Construction an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.	MS-LS4-4

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Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describes how organisms obtain and use energy throughout their lives.	3.1.7.A2
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe and explain how variables can cause changes in a system over time.	3.1.7.A2.A
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain why the life cycles of different organisms have varied lengths.	3.1.7.A3
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Understand limiting factors and predict their effects on an organism.	3.1.7.A3.B
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe the sequence of changes (Incomplete/Complete Metamorphosis) in an organism's life cycle.	3.1.7.A3.C
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe how natural selection is an underlying factor in a population's ability to adapt to changes.	S.7.B.2.1.2
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain that adaptations within species (physical, behavioral, physiological) are developed over long periods of time	S.7.B.2.1.3
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Determine adaptations among organisms that live in particular environment.	S.7.B.2.1.3.D

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Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants, respectively.	MS-LS1-4
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth or organisms.	MS-LS1-5
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.	MS-LS3-1
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.	MS-LS3-2
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.	MS-LS4-5
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Explain how the cell is the basic structural and functional unit of living things.	3.1.7.A5

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Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Explain how cells arise from division of pre-existing cells.	S7.B.1.2.1
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Describe how specific structures in living things (from cell to organism) help them function effectively in specific ways (e.g., chlorophyll in plant cells - photosynthesis; root hairs - increased surface area; beak structures in birds - food gathering; cacti spines - protection from predators).	S7.B.1.1.2
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Explain that cells and organisms have particular structures that underlie their function.	S7.B.1.1.2.A
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Identify the levels of organization from cell to organism.	S7.A.2.2
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Explain the concept of order in a system (e.g., first to last manufacturing steps; trophic levels; simple to complex—levels of biological organization from cell to organism).	S7.A.3.1.2
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Describe life processes and levels of biological organization from atom, molecules, organelle, cell, tissue, organ, organ system to complex multicellular organism.	S7.A.3.1.2.B

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Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Compare life processes (e.g. growth, digestion) at the organism level with life processes at the cellular level.	3.1.7.A7
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Compare various basic sexual and asexual reproductive processes (e.g., budding, cuttings).	S7.B.1.2.2
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Explain how genetic instructions influence inherited traits. Identify Mendelian patterns of inheritance.	3.1.7.B1
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Identify and explain differences between inherited and acquired traits.	S.7.B.2.21
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Recognize evidence that the gene is the basic unit of inheritance and explain the effect of dominant and recessive genes on inherited traits.	S.7.B.2.2.2
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Explain how inherited traits (genes) and/or behaviors help organisms survive and reproduce in different environments.	S.7.B.2.1.1

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Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Compare and contrast phenotype/genotype, homozygous/heterozygous, and dominant/recessive.	S.7.B.2.1.1.C
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	PATTERNS: Compare and contrast observable patterns in the physical characteristics across families, strains and species.	S.7.B.2.1.1.D
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Describe how selective breeding and biotechnology can alter the genetic composition of organisms.	3.1.7.B4
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Explain how mutations can alter a gene and are a source of new variations in a population.	S.7.B.2.2.3
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Describe how selective breeding or biotechnologies can change the genetic makeup of an organism (e.g., domesticated dogs, horses, cows; crops, hybrid plants; integrated pest management).	S.7.B.2.2.4
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Construct an explanation based on evidence that describes how genetic variation of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.	MS-LS4-4

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Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Describe how natural selection is an underlying factor in a population's ability to adapt to changes.	S.7.B.2.1.2
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Explain that adaptations within species (physical, behavioral, physiological) are developed over long periods of time	S.7.B.2.1.3
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Determine adaptations among organisms that live in particular environment.	S.7.B.2.1.3.A
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Explain why the extinction of a species may occur when the environment changes. Explain that mutations can alter a gene and are the original source of new variations in a population.	S.7.B.2.1.3.B
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	Describe how an environmental change can affect the survival of organisms and the entire species.	S.7.B.2.1.3.C
Science	Grade 7	7th Grade Science	Investigation 5 - Genetics	Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	CONSTANCY AND CHANGE Identify evidence drawn from geology, fossils, and comparative anatomy that provides the basis for the theory of evolution.	S.7.B.2.1.3.D
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	MS-LS1-5

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Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.	MS-LS3-2
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe the similarities and differences of physical characteristics in diverse organisms.	3.1.7.A1
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain how characteristic similarities and differences (from cell to organism) are used to identify and/or categorize organisms (Living, Nonliving, Dead, Dormant) to create an operational definition of living (All life is Aquatic at the cellular level).	3.1.7.A1.A
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Compare similarities and differences in internal and external structures of organisms.	3.1.7.A1.B
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Apply knowledge of characteristic structures to identify or categorize organisms (Dichotomous key)	3.1.7.A1.C
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe the difference between living cells that are organisms and living cells that are not organisms (Paramecium vs Elodea).	3.1.7.A1.D
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describes how organisms obtain and use energy throughout their lives.	3.1.7.A2
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe and explain how variables can cause changes in a system over time.	3.1.7.A2.E
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain the formation, function and use of trophic levels (Rule of 10%)	3.1.7.A2.F
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe energy transformations within an ecosystem	3.1.7.A2.G

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Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Demonstrate the dependency of living (Biotic) components in the ecosystem on the nonliving (Abiotic) components.	3.1.7.A2.H
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain the complex, interactive relationships among members of an ecosystem (food chain, food web).	3.1.7.A2.I
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe how every activity undertaken by living organism involves expenditure of energy.	3.1.7.A2.J
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain the importance of the predator/prey relationship and how it maintains the balance within ecosystems.	3.1.7.A2.K
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain the role of different plant structures in early plant growth (Cotyledon, Endosperm, Seed Coat, Embryo, Roots, Root Hairs).	3.1.7.A2.L
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain why the life cycles of different organisms have varied lengths.	3.1.7.A3
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Understand limiting factors and predict their effects on an organism.	3.1.7.A3.M
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain how living things respond to changes in their environment.	3.1.7.A3.N
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe the sequence of changes (Metamorphosis) in an organism’s life cycle.	3.1.7.A3.O
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain how the cell is the basic structural and functional unit of living things.	3.1.7.A5
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe how specific structures in living things (from cell to organism) help them function effectively in specific ways (e.g., chlorophyll in M: Explain how cells arise from pre-existing cells.	S7.B.1.1.2

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain how cells arise from the division of pre-existing cells.	S7.B.1.2.1
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain that cells and organisms have particular structures that underlie their function.	S7.B.1.2.1.P
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different either one cell or many different numbers and types of cells.	MS-LS1-1
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	MS-LS1-3
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.	MS-LS1-6
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through the organism.	MS-LS1-7
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Compare life processes (e.g. growth, digestion) at the organism level with life processes at the cellular level.	3.1.7.A7
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Identify and describe the major parts (Root to Stomata) of transpiration and the effects on the organism and environment recognizing transpiration as a component of the water cycle.	3.1.7.A7.A
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain the function of flowers in pollination and fertilization utilizing the specific male and female flower parts to describe the processes.	3.1.7.A7.B
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain how seed-dispersal mechanism contribute to a plan’s survival.	3.1.7.A7.C

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Compare various basic sexual and asexual reproductive processes (e.g., budding, cuttings).	3.1.7.A7.D
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Apply the appropriate models to show interactions among organisms in an environment.	3.1.7.A8.
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Analyze the roles of different cycles within an ecosystem.	3.1.7.A8.E
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe habitat in terms of the needs and preferences of an organism.	3.1.7.A8.F
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Evaluate decomposition at the organism and environmental levels.	3.1.7.A8.G
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Evaluate the organization of an ecosystem (Individual, population, community, food chain, food web).	3.1.7.A8.H
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Compare and contrast different ecosystems and how they are affected by humans.	3.1.7.A8.I
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants, respectively.	MS-LS1-4
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.	MS-LS3-2
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe the similarities and differences of physical characteristics in diverse organisms.	3.1.7.A1

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain how characteristic similarities and differences (from cell to organism) are used to identify and/or categorize organisms (Living, Nonliving, Dead, Dormant) to create an operational definition of living (All life is Aquatic at the cellular level).	3.1.7.A1.A
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Compare similarities and differences in internal and external structures of organisms.	3.1.7.A1.B
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Apply knowledge of characteristic structures to identify or categorize organisms (Dichotomous key)	3.1.7.A1.C
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain why the life cycles of different organisms have varied lengths.	3.1.7.A3
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Understand limiting factors and predict their effects on an organism.	3.1.7.A3.D
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain how living things respond to changes in their environment.	3.1.7.A3.E
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe the sequence of changes (Metamorphosis) in an organism’s life cycle.	3.1.7.A3.F
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe how specific structures in living things (from cell to organism) help them function effectively in specific ways (e.g., chlorophyll in plant cells— photosynthesis; root hairs—increased surface area; beak structures in birds— food gathering; cacti spines—protection from predators).	3.1.7.A3.G
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain the function of flowers in pollination and fertilization utilizing the specific male and female flower parts to describe the processes.	3.1.7.A3.H
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain how seed-dispersal mechanism contribute to a plant's survival.	3.1.7.A3.I

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 6 - Plants	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Compare various basic sexual and asexual reproductive processes (e.g., budding, cuttings).	3.1.7.A3.J
Science	Grade 7	7th Grade Science	Investigation 7 - Insects	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	MS-LS1-3
Science	Grade 7	7th Grade Science	Investigation 7 - Insects	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe the similarities and differences of physical characteristics in diverse organisms.	3.1.7.A1
Science	Grade 7	7th Grade Science	Investigation 7 - Insects	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain how characteristic similarities and differences (from cell to organism) are used to identify and/or categorize organisms (Living, Nonliving, Dead, Dormant) to create an operational definition of living (All life is Aquatic at the cellular level).	3.1.7.A1.A
Science	Grade 7	7th Grade Science	Investigation 7 - Insects	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Compare similarities and differences in internal and external structures of organisms.	3.1.7.A1.B
Science	Grade 7	7th Grade Science	Investigation 7 - Insects	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Apply knowledge of characteristic structures to identify or categorize organisms (Dichotomous key)	3.1.7.A1.C
Science	Grade 7	7th Grade Science	Investigation 7 - Insects	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe the difference between living cells that are organisms and living cells that are not organisms (Paramecium vs Elodea).	3.1.7.A1.D
Science	Grade 7	7th Grade Science	Investigation 7 - Insects	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain why the life cycles of different organisms have varied lengths.	3.1.7.A3
Science	Grade 7	7th Grade Science	Investigation 7 - Insects	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Understand limiting factors and predict their effects on an organism.	3.1.7.A3.E
Science	Grade 7	7th Grade Science	Investigation 7 - Insects	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain how living things respond to changes in their environment.	3.1.7.A3.F
Science	Grade 7	7th Grade Science	Investigation 7 - Insects	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe the sequence of changes (Incomplete/Complete Metamorphosis) in an organism's life cycle.	3.1.7.A3.G

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 7 - Insects	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain how the cell is the basic structural and functional unit of living things.	3.1.7.A5
Science	Grade 7	7th Grade Science	Investigation 7 - Insects	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe how specific structures in living things (from cell to organism) help them function effectively in specific ways (e.g., chlorophyll in plant cells— photosynthesis; root hairs— increased surface area; beak structures in birds— food gathering; cacti spines—protection from predators).	S7.B.1.1.2
Science	Grade 7	7th Grade Science	Investigation 7 - Insects	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain how cells arise from division of pre-existing cells	S7.B.1.2.1
Science	Grade 7	7th Grade Science	Investigation 7 - Insects	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain that cells and organisms have particular structures that underlie their function	S7.B.1.2.1.H
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	MS-LS2-2
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	MS-LS2-5
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe the similarities and differences of physical characteristics in diverse organisms.	3.1.7.A1
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain how characteristic similarities and differences (from cell to organism) are used to identify and/or categorize organisms (Living, Nonliving, Dead, Dormant) to create an operational definition of living (All life is Aquatic at the cellular level).	3.1.7.A1.A
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Compare similarities and differences in internal and external structures of organisms.	3.1.7.A1.B
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Apply knowledge of characteristic structures to identify or categorize organisms (Dichotomous key)	3.1.7.A1.C

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe the difference between living cells that are organisms and living cells that are not organisms (Paramecium vs Elodea).	3.1.7.A1.D
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describes how organisms obtain and use energy throughout their lives.	3.1.7.A2
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe and explain how variables can cause changes in a system over time.	3.1.7.A2.E
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain the formation, function and use of trophic levels (Rule of 10%)	3.1.7.A2.F
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe energy transformations within an ecosystem	3.1.7.A2.G
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Demonstrate the dependency of living (Biotic) components in the ecosystem on the nonliving (Abiotic) components.	3.1.7.A2.H
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain the complex, interactive relationships among members of an ecosystem (food chain, food web).	3.1.7.A2.I
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe how every activity undertaken by living organism involves expenditure of energy.	3.1.7.A2.J
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain the importance of the predator/prey relationship and how it maintains the balance within ecosystems.	3.1.7.A2.K
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Explain the role of different plant structures in early plant growth (Cotyledon, Endosperm, Seed Coat, Embryo, Roots, Root Hairs).	3.1.7.A2.L
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Apply the appropriate models to show interactions among organisms in an environment.	3.1.7.A8

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Analyze the roles of different cycles within an ecosystem.	3.1.7.A8.M
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe habitat in terms of the needs and preferences of an organism.	3.1.7.A8.N
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Evaluate decomposition at the organism and environmental levels.	3.1.7.A8.O
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Evaluate the organization of an ecosystem (Individual, population, community, food chain, food web).	3.1.7.A8.P
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Compare and contrast different ecosystems and how they are affected by humans.	3.1.7.A8.Q
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Understand how theories are developed.	3.1.7.C4.A
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Identify questions that can be answered through scientific investigations and evaluate the appropriateness of questions	3.1.7.C4.B
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Design and conduct a scientific investigation and understand that current scientific knowledge guides scientific investigations	3.1.7.C4.C
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Describe relationships using inference and prediction	3.1.7.C4.D
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Use appropriate tools and technologies to gather, analyze, and interpret data and understand that it enhances accuracy and allows scientists to analyze and quantify results of investigations	3.1.7.C4.E
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Develop descriptions, explanations, and models using evidence and understand that these emphasize evidence, have logically consistant arguments, and are based on scientific principles, models, and theories	3.1.7.C4.F

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Analyze alternative explanations and understand that science advances through legitimate skepticism	3.1.7.C4.G
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Use mathematics in all aspects of scientific inquiry	3.1.7.C4.H
Science	Grade 7	7th Grade Science	Investigation 8 - Bacteria and Fungi	All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Understand that scientific investigations may results in new ideas for study, new methods, or procedures for an investigation or new technologies to improve data collection	3.1.7.C4.I
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	MS-LS2-2
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	MS-LS2-1
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describes how organisms obtain and use energy throughout their lives.	3.1.7.A2
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe and explain how variables can cause changes in a system over time	3.1.7.A2.A
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain the formation, function and use of trophic levels (Rule of 10%)	3.1.7.A2.B
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe energy transformations within an ecosystem	S7.C.2.1.3

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Demonstrate the dependency of living (Biotic) components in the ecosystem on the nonliving (Abiotic) components.	S7.C.2.1.3.C
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain the complex, interactive relationships among members of an ecosystem of energy	S7.C.2.1.3.D
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe how every activity undertaken by living organisms involves expenditure of energy	S7.C.2.1.3.E
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain the importance of the predator/prey relationship and now it maintains the balance within ecosystems	S7.C.2.1.3.F
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain the role of different plant structures in early plant growth (Cotyledon, Endosperm, Seed Coat, Embryo, Roots, Root Hairs)	S7.C.2.1.3.G
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Identify the levels of organization from cell to organism.	3.1.7.A6
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain the concept of order in a system (e.g., first to last manufacturing steps; trophic levels; simple to complex—levels of biological organization from cell to organism).	S7.A.3.1.2
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Apply the appropriate models to show interactions among organisms in an environment.	3.1.7.A8.

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Analyze the roles of different cycles within an ecosystem	3.1.7.A8.H
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Compare and contrast different ecosystems and how they are affected by humans.	3.1.7.A8.I
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Evaluate decomposition at the organism and environmental levels.	3.1.7.A8.J
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Evaluate the organization of an ecosystem (Individual, population, community, food chain, food web).	3.1.7.A8.K
Science	Grade 7	7th Grade Science	Investigation 9 - Basics of Ecology	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Compare and contrast different ecosystems and how they are affected by humans.	3.1.7.A8.L
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	MS-LS2-2
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	MS-LS2-3
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describes how organisms obtain and use energy throughout their lives.	3.1.7.A2

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain the formation, function and use of trophic levels (Rule of 10%)	3.1.7.A2.A
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe energy transformations within an ecosystem	S7.C.2.1.3
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Demonstrate the dependency of living (biotic) components in the ecosystem on the nonliving (abiotic)	S7.C.2.1.3.B
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain the complex, interactive relationships among members of an ecosystem (Food chain, food web).	S7.C.2.1.3.C
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe how every activity undertaken by living organisms involves expenditure of energy.	S7.C.2.1.3.D
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain the importance of the predator/prey relationship and how it maintains the balance within ecosystems.	S7.C.2.1.3.E
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain why the life cycles of different organisms have varied lengths.	3.1.7.A3
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Understand limiting factors and predict their effects on an organism.	3.1.7.A3.F

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain how living things respond to changes in their environment.	3.1.7.A3.G
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe the sequence of changes (Incomplete/Complete Metamorphosis) in an organism's life cycle.	3.1.7.A3.H
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Apply the appropriate models to show interactions among organisms in an environment.	3.1.7.A8.
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Compare and contrast different ecosystems and how they are affected by humans.	3.1.7.A8.I
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Evaluate decomposition at the organism and environmental levels.	3.1.7.A8.J
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Evaluate the organization of an ecosystem (Individual, population, community, food chain, food web).	3.1.7.A8.K
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Compare and contrast different ecosystems and how they are affected by humans.	3.1.7.A8.L
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Compare and contrast different ecosystems and how they are affected by humans.	3.1.7.A8.M

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe how natural selection is an underlying factor in a population's ability to adapt to changes.	3.1.7.C1
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Determine adaptations among organisms that live in particular environment.	3.1.7.C1.N
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain why the extinction of a species may occur when the environment changes. Explain that mutations can alter a gene and are the original source of new variations in a population.	3.1.7.C2
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain that adaptations within species (physical, behavioral, physiological) are developed every long periods of time.	3.1.7.C2.O
Science	Grade 7	7th Grade Science	Investigation 10 - Ecosystem Case Studies	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe how an environmental change can affect the survival of organisms and the entire species.	3.1.7.C2.P
Science	Grade 7	7th Grade Science	Investigation 11 - Energy Within the System	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.	MS-LS1-6
Science	Grade 7	7th Grade Science	Investigation 11 - Energy Within the System	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.	MS-LS1-7
Science	Grade 7	7th Grade Science	Investigation 11 - Energy Within the System	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	MS-LS2-3

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 11 - Energy Within the System	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describes how organisms obtain and use energy throughout their lives.	3.1.7.A2
Science	Grade 7	7th Grade Science	Investigation 11 - Energy Within the System	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain the formation, function and use of trophic levels (Rule of 10%)	3.1.7.A2.A
Science	Grade 7	7th Grade Science	Investigation 11 - Energy Within the System	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe energy transformations within an ecosystem	S7.C.2.1.3
Science	Grade 7	7th Grade Science	Investigation 11 - Energy Within the System	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Demonstrate the dependency of living (biotic) components in the ecosystem on the nonliving (abiotic) components.	S7.C.2.1.3.B
Science	Grade 7	7th Grade Science	Investigation 11 - Energy Within the System	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain the complex, interactive relationships among members of an ecosystem (Food chain, food web).	S7.C.2.1.3.C
Science	Grade 7	7th Grade Science	Investigation 11 - Energy Within the System	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe how every activity undertaken by living organisms involves expenditure of energy.	S7.C.2.1.3.D
Science	Grade 7	7th Grade Science	Investigation 11 - Energy Within the System	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain the importance of the predator/prey relationship and how it maintains the balance within ecosystems.	S7.C.2.1.3.E
Science	Grade 7	7th Grade Science	Investigation 11 - Energy Within the System	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain the role of different plant structures in early plant growth (Cotyledon, Endosperm, Seed Coat, Embryo, Roots, Root Hairs)	S7.C.2.1.3.F

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 11 - Energy Within the System	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	CHEMISTRY - Describe how reactants change into products in simple chemical reactions.	3.2.7.A4
Science	Grade 7	7th Grade Science	Investigation 11 - Energy Within the System	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Distinguish between system inputs, system processes, system outputs, and system feedback.	S7A.3.1.3
Science	Grade 7	7th Grade Science	Investigation 11 - Energy Within the System	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Use mathematics in all aspects of scientific inquiry.(Nature of Science)	S7A.3.1.3.G
Science	Grade 7	7th Grade Science	Investigation 11 - Energy Within the System	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Use evidence to develop descriptions, explanations, and models.	S7.A.1.1.4
Science	Grade 7	7th Grade Science	Investigation 12 - Analyzing Scientific Data	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	MS-LS2-1
Science	Grade 7	7th Grade Science	Investigation 12 - Analyzing Scientific Data	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	MS-LS2-4
Science	Grade 7	7th Grade Science	Investigation 12 - Analyzing Scientific Data	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	MS-LS2-2
Science	Grade 7	7th Grade Science	Investigation 12 - Analyzing Scientific Data	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describes how organisms obtain and use energy throughout their lives.	3.1.7.A2

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 12 - Analyzing Scientific Data	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe and explain how variables can cause changes in a system over time.	3.1.7.A2.A
Science	Grade 7	7th Grade Science	Investigation 12 - Analyzing Scientific Data	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain the formation, function and use of trophic level (Rule of 10%)	3.1.7.A2.B
Science	Grade 7	7th Grade Science	Investigation 12 - Analyzing Scientific Data	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe energy transformations within an ecosystem	S7.C.2.1.3
Science	Grade 7	7th Grade Science	Investigation 12 - Analyzing Scientific Data	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Demonstrate the dependency of living (Biotic) components in the ecosystem on the nonliving (Abiotic) components.	S7.C.2.1.3.C
Science	Grade 7	7th Grade Science	Investigation 12 - Analyzing Scientific Data	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain why the life cycles of different organisms have varied lengths.	3.1.7.A3
Science	Grade 7	7th Grade Science	Investigation 12 - Analyzing Scientific Data	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Understand limiting factors and predict their effects on an organism.	3.1.7.A3.D
Science	Grade 7	7th Grade Science	Investigation 12 - Analyzing Scientific Data	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Explain how living things respond to changes in their environment.	3.1.7.A3.E
Science	Grade 7	7th Grade Science	Investigation 12 - Analyzing Scientific Data	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Describe the sequence of changes (Incomplete/Complete Metamorphosis) in an organism’s life cycle.	3.1.7.A3.F

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 7	7th Grade Science	Investigation 12 - Analyzing Scientific Data	Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	MS-LS2-4
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	MS-PS1-2
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Apply the elements of scientific inquiry to solve problems.	S8.A.1.1.2.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Develop descriptions, explanations, predictions, and models using evidence.	S8.A.1.1.4.A2
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Make connections between evidence and explanations, by thinking critically and logically.	S8.A.1.1.4.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Generate evidence to support an idea, by making observations.	S8.A.1.1.3
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Apply knowledge and understanding about the use of technology and the nature of science.	S8.A.1.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Use appropriate tools and techniques to gather, analyze, and interpret data.	S8.A.1.1.3.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Explain concepts about the structure and properties of matter.	S8.C.1.1.1.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Explain that a reaction changes initial substances into new, different substances.	S8.C.1.1.1.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Use characteristic physical or chemical properties to distinguish one substance from another. (density, thermal expansion and contraction, freezing and melting points)	S8.C.1.1.2.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Explain how to identify substances in an unknown mixtures.	S8.C.1.1.2.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Identify and describe reactants and products of simple chemical reactions.	S8.C.1.1.3.A

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Design an investigation with limited variable to investigate a question.	S8.A.2.1.3.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 2	Interactions between any two objects can cause changes in one or both of them.	Develop models to describe the atomic composition of simple molecules and extended structures.	MS-PS1-1
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 2	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.	MS-PS1-3
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 2	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply the elements of scientific inquiry to solve problems.	S8.A.1.1.2.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 2	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Generate evidence to support an idea, by making observations	S8.A.1.1.3
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 2	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Develop descriptions, explanations, predictions, and models using evidence.	S8.A.1.1.4.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 2	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Make connections between evidence and explanations, by thinking critically and logically.	S8.A.1.1.4.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 2	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 2	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Design an investigation with limited variable to investigate a question.	S8.A.2.1.3.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 2	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 2	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain concepts about the structure and properties of matter.	S8.C.1.1.1.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 2	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain that a reaction changes initial substances into new, different substances.	S8.C.1.1.1.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 2	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain that all common matter is made of elements.	S8.C.1.1.1.C
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 2	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain how to identify substances in an unknown mixtures.	S8.C.1.1.1.D
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 2	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Use characteristic physical or chemical properties to distinguish one substance from another. (density, thermal expansion and contraction, freezing and melting points)	S8.C.1.1.2.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 2	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Identify and describe reactants and products of simple chemical reactions.	S8.C.1.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	MS-PS1-2
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.	MS-PS1-4
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply the elements of scientific inquiry to solve problems.	S8.A.1.1.2.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Generate evidence to support an idea, by making observations.	S8.A.1.1.3
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply knowledge and understanding about the use of technology and the nature of science.	S8.A.1.1.3.A

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Use appropriate tools and techniques to gather, analyze, and interpret data.	S8.A.1.1.3.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Use drawings and words to explain gas compression and expansion.	S8.A.1.1.3.C
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Develop descriptions, explanations, predictions, and models using evidence.	S8.A.1.1.4.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Make connections between evidence and explanations, by thinking critically and logically.	S8.A.1.1.4.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Design an investigation with limited variable to investigate a question.	S8.A.2.1.3.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain concepts about the structure and properties of matter.	S8.C.1.1.1.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain that a reaction changes initial substances into new, different substances.	S8.C.1.1.1.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain how to identify substances in an unknown mixtures.	S8.C.1.1.1.D
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain the composition of gas in terms of individual particles in constant motion.	S8.C.1.1.1.E

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Use characteristic physical or chemical properties to distinguish one substance from another. (density, thermal expansion and contraction, freezing and melting points)	S8.C.1.1.2.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 3	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Identify and describe reactants and products of simple chemical reactions.	S8.C.1.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.	MS-PS1-4
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Apply the elements of scientific inquiry to solve problems.	S8.A.1.1.2.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Generate evidence to support and idea, by making observations.	S8.A.1.1.3
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Develop descriptions, explanations, predictions, and models using evidence.	S8.A.1.1.4.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Make connections between evidence and explanations, by thinking critically and logically.	S8.A.1.1.4.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Explain concepts about the structure and properties of matter	S8.C.1.1.1.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Explain that a reaction changes initial substances into new, different substances.	S8.C.1.1.1.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Explain how to identify substances in an unknown mixtures.	S8.C.1.1.1.D
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Use characteristic physical or chemical properties to distinguish one substance from another. (density, thermal expansion and contraction, freezing and melting points)	S8.C.1.1.2.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Identify and describe reactants and products of simple chemical reactions.	S8.C.1.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Design an investigation with limited variable to investigate a question.	S8.A.2.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Generate evidence to support an idea, by making observations.	S8.A.1.1.3
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Apply knowledge and understanding about the use of technology and the nature of science.	S8.A.1.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Use appropriate tools and techniques to gather, analyze, and interpret data.	S8.A.1.1.3.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Describe energy sources, transfer of energy, or conversion of energy.	S8.A.1.1.3.D
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Discuss expansion and contraction at the microscopic and particle levels.	S8.A.1.1.3.E
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Explain expansion and contraction in terms of kinetic energy.	S8.A.1.1.3.F
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Explain how a thermometer works.	S8.A.1.1.3.G
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.	MS-PS1-4
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.	MS-PS3-4
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.	MS-PS3-3

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Construct, use and present arguments to support the claim that when the motion energy of an object changes, energy is transferred to or from the object	MS-PS3-5
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Apply the elements of scientific inquiry to solve problems.	S8.A.1.1.2
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Generate evidence to support an idea, by making observations.	S8.A.1.1.3
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Apply knowledge and understanding about the use of technology and the nature of science.	S8.A.1.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Use appropriate tools and techniques to gather, analyze, and interpret data.	S8.A.1.1.3.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Describe energy sources, transfer of energy, or conversion of energy.	S8.A.1.1.3.D
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Explain energy transfer in terms of the change of particle kinetic energy resulting from collision.	S8.A.1.1.3.H
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Discuss energy transfer in water in terms of calories.	S8.A.1.1.3.I
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Develop descriptions, explanations, predictions, and models using evidence.	S8.A.1.1.4.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Make connections between evidence and explanations, by thinking critically and logically.	S8.A.1.1.4.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Design an investigation with limited variable to investigate a question.	S8.A.2.1.3.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Explain concepts about the structure and properties of matter.	S8.C.1.1.1.A

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Explain that a reaction changes initial substances into new, different substances.	S8.C.1.1.1.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Explain how to identify substances in an unknown mixtures.	S8.C.1.1.1.D
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Use characteristic physical or chemical properties to distinguish one substance from another. (density, thermal expansion and contraction, freezing and melting points)	S8.C.1.1.2.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Identify and describe reactants and products of simple chemical reactions.	S8.C.1.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.	MS-PS3-3
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	MS-ETS1-1
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	MS-ETS1-2
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply the elements of scientific inquiry to solve problems.	S8.A.1.1.2.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Generate evidence to support an idea, by making observations.	S8.A.1.1.3
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply knowledge and understanding about the use of technology and the nature of science.	S8.A.1.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Use appropriate tools and techniques to gather, analyze, and interpret data.	S8.A.1.1.3.B

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain the apparent discrepancy in energy transfer when hot water melts ice.	S8.A.1.1.3.J
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain that heat of fusion is energy that melts ice without changing the kinetic energy of the particles.	S8.A.1.1.3.K
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Develop descriptions, explanations, predictions, and models using evidence.	S8.A.1.1.4.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Make connections between evidence and explanations, by thinking critically and logically.	S8.A.1.1.4.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain concepts about the structure and properties of matter.	S8.C.1.1.1.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain that a reaction changes initial substances into new, different substances.	S8.C.1.1.1.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain how to identify substances in an unknown mixtures.	S8.C.1.1.1.D
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Use characteristic physical or chemical properties to distinguish one substance from another. (density, thermal expansion and contraction, freezing and melting points)	S8.C.1.1.2.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Identify and describe reactants and products of simple chemical reactions.	S8.C.1.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 6	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 7	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Develop models to describe the atomic composition of simple molecules and extended structures.	MS-PS1-1
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 7	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	MS-PS1-2
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 7	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.	MS-PS1-4
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 7	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply the elements of scientific inquiry to solve problems.	S8.A.1.1.2.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 7	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Generate evidence to support an idea, by making observations.	S8.A.1.1.3
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 7	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply knowledge and understanding about the use of technology and the nature of science.	S8.A.1.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 7	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Use appropriate tools and techniques to gather, analyze, and interpret data.	S8.A.1.1.3.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 7	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Develop descriptions, explanations, predictions, and models using evidence.	S8.A.1.1.4.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 7	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Make connections between evidence and explanations, by thinking critically and logically.	S8.A.1.1.4.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 7	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 7	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 7	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain concepts about the structure and properties of matter.	S8.C.1.1.1.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 7	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain that a reaction changes initial substances into new, different substances.	S8.C.1.1.1.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 7	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain how to identify substances in an unknown mixtures.	S8.C.1.1.1.D
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 7	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Use characteristic physical or chemical properties to distinguish one substance from another. (density, thermal expansion and contraction, freezing and melting points)	S8.C.1.1.2.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 7	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Identify and describe reactants and products of simple chemical reactions.	S8.C.1.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 7	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.	MS-PS1-4
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.	MS-PS3-4
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Undertake a design project to construct, test, and modify a device that either release or absorbs thermal energy by chemical processes.	MS-PS1-6

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	MS-ETS1-1
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	MS-ETS1-2
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Analyze data from tests to determine similarities and difference among several design solutions to identify the best characteristics of each that can be combined into a new solutions to better meet the criteria for success.	MS-ETS1-3
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Develop a model to generate data for iterative	MS-ETS1-4
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply the elements of scientific inquiry to solve problems.	S8.A.1.1.2.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain concepts about the structure and properties of matter.	S8.C.1.1.1.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain that a reaction changes initial substances into new, different substances.	S8.C.1.1.1.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain how to identify substances in an unknown mixtures.	S8.C.1.1.1.D
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply knowledge and understanding about the use of technology and the nature of science.	S8.A.1.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Use appropriate tools and techniques to gather, analyze, and interpret data.	S8.A.1.1.3.B

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Develop descriptions, explanations, predictions, and models using evidence.	S8.A.1.1.4.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Make connections between evidence and explanations, by thinking critically and logically.	S8.A.1.1.4.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Use characteristic physical or chemical properties to distinguish one substance from another. (density, thermal expansion and contraction, freezing and melting points)	S8.C.1.1.2.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Identify and describe reactants and products of simple chemical reactions.	S8.C.1.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 8	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 9	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Develop models to describe the atomic composition of simple molecules and extended structures.	MS-PS1-1
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 9	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	MS-PS1-2
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 9	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.	MS-PS1-5
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 9	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Some chemical reactions release energy, others store energy.	MS-PS1-6

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 9	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply the elements of scientific inquiry to solve problems.	S8.A.1.1.2.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 9	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply knowledge and understanding about the use of technology and the nature of science.	S8.A.1.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 9	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Use appropriate tools and techniques to gather, analyze, and interpret data.	S8.A.1.1.3.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 9	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Develop descriptions, explanations, predictions, and models using evidence.	S8.A.1.1.4.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 9	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Make connections between evidence and explanations, by thinking critically and logically.	S8.A.1.1.4.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 9	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 9	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Design an investigation with limited variable to investigate a question.	S8.A.2.1.3.B
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 9	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 9	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain concepts about the structure and properties of matter.	S8.C.1.1.1.A
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 9	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain how to identify substances in an unknown mixtures.	S8.C.1.1.1.D
Science	Grade 8	8th Grade Science	Chemical Interactions - Investigation 9	Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	Explain chemical reaction as a process in which atoms rearrange to form new substances.	S8.C.1.1.2.C

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	MS-PS2-2
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.	MS-PS2-5
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.	MS-PS3-5
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Apply the elements of scientific inquiry to solve problems.	S8.A.1.1.2.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Generate evidence to support an idea, by making observations.	S8.A.1.1.3
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Distinguish among the principles of force and motion.	S8.A.1.1.3.L
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Describe an object's motion in terms of change in position.	S8.A.1.1.3.M
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Explain how to use a reference point to determine distance moved.	S8.A.1.1.3.N
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Measure distance in standard metric units.	S8.A.1.1.3.O2
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Calculate distance when initial and final positions are known.	S8.A.1.1.3.P
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Make connections between evidence and explanations, by thinking critically and logically.	S8.A.1.1.4.B
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Observe and infer how variables affect change.	S8.A.1.3.2.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Design an investigation with limited variable to investigate a question.	S8.A.2.1.3.B
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 1	Interactions between any two objects can cause changes in one or both of them.	Measure materials using a variety of scales.	S8.A.2.2.1.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 2	Interactions between any two objects can cause changes in one or both of them.	Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	MS-PS2-2
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 2	Interactions between any two objects can cause changes in one or both of them.	Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.	MS-PS2-5
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 2	Interactions between any two objects can cause changes in one or both of them.	Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.	MS-PS3-5
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 2	Interactions between any two objects can cause changes in one or both of them.	Apply the elements of scientific inquiry to solve problems.	S8.A.1.1.2.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 2	Interactions between any two objects can cause changes in one or both of them.	Generate evidence to support an idea, by making observations.	S8.A.1.1.3
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 2	Interactions between any two objects can cause changes in one or both of them.	Make connections between evidence and explanations, by thinking critically and logically.	S8.A.1.1.4.B
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 2	Interactions between any two objects can cause changes in one or both of them.	Observe and infer how variables affect change.	S8.A.1.3.2.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 2	Interactions between any two objects can cause changes in one or both of them.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 2	Interactions between any two objects can cause changes in one or both of them.	Design an investigation with limited variable to investigate a question.	S8.A.2.1.3.B
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 2	Interactions between any two objects can cause changes in one or both of them.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 2	Interactions between any two objects can cause changes in one or both of them.	Measure materials using a variety of scales.	S8.A.2.2.1.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 3	Interactions between any two objects can cause changes in one or both of them.	Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object	MS-PS3-1
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 3	Interactions between any two objects can cause changes in one or both of them.	Apply the elements of scientific inquiry to solve problems.	S8.A.1.1.2.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 3	Interactions between any two objects can cause changes in one or both of them.	Generate evidence to support an idea, by making observations.	S8.A.1.1.3
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 3	Interactions between any two objects can cause changes in one or both of them.	Make connections between evidence and explanations, by thinking critically and logically.	S8.A.1.1.4.B
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 3	Interactions between any two objects can cause changes in one or both of them.	Observe and infer how variables affect change.	S8.A.1.3.2.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 3	Interactions between any two objects can cause changes in one or both of them.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 3	Interactions between any two objects can cause changes in one or both of them.	Design an investigation with limited variable to investigate a question.	S8.A.2.1.3.B
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 3	Interactions between any two objects can cause changes in one or both of them.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 3	Interactions between any two objects can cause changes in one or both of them.	Measure materials using a variety of scales.	S8.A.2.2.1.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	MS-PS2-2
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.	MS-PS3-1
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Apply the elements of scientific inquiry to solve problems.	S8.A.1.1.2.A

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Generate evidence to support an idea, by making observations.	S8.A.1.1.3
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Make connections between evidence and explanations, by thinking critically and logically.	S8.A.1.1.4.B
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Observe and infer how variables affect change.	S8.A.1.3.2.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Design an investigation with limited variable to investigate a question.	S8.A.2.1.3.B
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 4	Interactions between any two objects can cause changes in one or both of them.	Measure materials using a variety of scales.	S8.A.2.2.1.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	MS-PS2-2
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.	MS-PS3-1
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Apply the elements of scientific inquiry to solve problems.	S8.A.1.1.2.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Generate evidence to support an idea, by making observations.	S8.A.1.1.3
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Make connections between evidence and explanations, by thinking critically and logically.	S8.A.1.1.4.B
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Observe and infer how variables affect change.	S8.A.1.3.2.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Design an investigation with limited variable to investigate a question.	S8.A.2.1.3.B
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 5	Interactions between any two objects can cause changes in one or both of them.	Measure materials using a variety of scales.	S8.A.2.2.1.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 6	Interactions between any two objects can cause changes in one or both of them.	Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.	MS-PS2-1
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 6	Interactions between any two objects can cause changes in one or both of them.	Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	MS-PS2-2
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 6	Interactions between any two objects can cause changes in one or both of them.	Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.	MS-PS3-1
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 6	Interactions between any two objects can cause changes in one or both of them.	Apply the elements of scientific inquiry to solve problems.	S8.A.1.1.2.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 6	Interactions between any two objects can cause changes in one or both of them.	Generate evidence to support an idea, by making observations.	S8.A.1.1.3
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 6	Interactions between any two objects can cause changes in one or both of them.	Make connections between evidence and explanations, by thinking critically and logically.	S8.A.1.1.4.B
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 6	Interactions between any two objects can cause changes in one or both of them.	Observe and infer how variables affect change.	S8.A.1.3.2.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 6	Interactions between any two objects can cause changes in one or both of them.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 6	Interactions between any two objects can cause changes in one or both of them.	Design an investigation with limited variable to investigate a question.	S8.A.2.1.3.B
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 6	Interactions between any two objects can cause changes in one or both of them.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 6	Interactions between any two objects can cause changes in one or both of them.	Measure materials using a variety of scales.	S8.A.2.2.1.A

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 7	Interactions between any two objects can cause changes in one or both of them.	Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.	MS-PS2-1
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 7	Interactions between any two objects can cause changes in one or both of them.	Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	MS-PS2-2
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 7	Interactions between any two objects can cause changes in one or both of them.	Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.	MS-PS3-1
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 7	Interactions between any two objects can cause changes in one or both of them.	Apply the elements of scientific inquiry to solve problems.	S8.A.1.1.2.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 7	Interactions between any two objects can cause changes in one or both of them.	Generate evidence to support an idea, by making observations.	S8.A.1.1.3
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 7	Interactions between any two objects can cause changes in one or both of them.	Make connections between evidence and explanations, by thinking critically and logically.	S8.A.1.1.4.B
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 7	Interactions between any two objects can cause changes in one or both of them.	Observe and infer how variables affect change.	S8.A.1.3.2.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 7	Interactions between any two objects can cause changes in one or both of them.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 7	Interactions between any two objects can cause changes in one or both of them.	Design an investigation with limited variable to investigate a question.	S8.A.2.1.3.B
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 7	Interactions between any two objects can cause changes in one or both of them.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 7	Interactions between any two objects can cause changes in one or both of them.	Measure materials using a variety of scales.	S8.A.2.2.1.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 8	Interactions between any two objects can cause changes in one or both of them.	Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.	MS-PS2-1
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 8	Interactions between any two objects can cause changes in one or both of them.	Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	MS-PS2-2

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 8	Interactions between any two objects can cause changes in one or both of them.	Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.	MS-PS3-1
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 8	Interactions between any two objects can cause changes in one or both of them.	Apply the elements of scientific inquiry to solve problems.	S8.A.1.1.2.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 8	Interactions between any two objects can cause changes in one or both of them.	Generate evidence to support an idea, by making observations.	S8.A.1.1.3
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 8	Interactions between any two objects can cause changes in one or both of them.	Make connections between evidence and explanations, by thinking critically and logically.	S8.A.1.1.4.B
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 8	Interactions between any two objects can cause changes in one or both of them.	Observe and infer how variables affect change.	S8.A.1.3.2.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 8	Interactions between any two objects can cause changes in one or both of them.	Design and conduct scientific investigations and develop explanations based on evidence.	S8.A.2.1.3.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 8	Interactions between any two objects can cause changes in one or both of them.	Design an investigation with limited variable to investigate a question.	S8.A.2.1.3.B
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 8	Interactions between any two objects can cause changes in one or both of them.	Apply process knowledge to make and interpret observations.	S8.A.2.1.4.A
Science	Grade 8	8th Grade Science	Force and Motion - Investigation 8	Interactions between any two objects can cause changes in one or both of them.	Measure materials using a variety of scales.	S8.A.2.2.1.A
Science	AP Chemistry	HS	Unit 1: Introduction and Review Concepts	BI1 The chemical elements are fundamental building materials of matter, and all matter can be understood in terms of arrangements of atoms. These atoms retain their identity in chemical reactions.	The student is able to connect the number of particles, moles, mass, and volume of substances to one another, both qualitatively and quantitatively. [See SP7.1]	LO1.4
Science	AP Chemistry	HS	Unit 1: Introduction and Review Concepts	BI1 The chemical elements are fundamental building materials of matter, and all matter can be understood in terms of arrangements of atoms. These atoms retain their identity in chemical reactions.	The student is able to use data from mass spectrometry to identify the elements and the masses of individual atoms of a specific element. [See SP1.4, 1.5]	LO1.14

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	AP Chemistry	HS	Unit 1: Introduction and Review Concepts	BI1 The chemical elements are fundamental building materials of matter, and all matter can be understood in terms of arrangements of atoms. These atoms retain their identity in chemical reactions.	The student can justify the selection of a particular type of spectroscopy to measure properties associated with vibrational or electronic motions of molecules. [See SP4.1, 6.4]	LO1.15
Science	AP Chemistry	HS	Unit 1: Introduction and Review Concepts	BI1 The chemical elements are fundamental building materials of matter, and all matter can be understood in terms of arrangements of atoms. These atoms retain their identity in chemical reactions.	The student can design, and/or interpret data from, an experiment that uses gravimetric analysis to determine the concentration of an analyte in a solution. [See SP4.2, 5.1, 6.4]	LO1.19
Science	AP Chemistry	HS	Unit 1: Introduction and Review Concepts	BI2 Chemical and physical properties of materials can be explained by the structure and the arrangement of atoms, ions, or molecules and the forces between them.	The student is able to describe the relationships between the structural features of polar molecules and the forces of attraction between the particles. [See SP1.4, 6.4]	LO2.13
Science	AP Chemistry	HS	Unit 1: Introduction and Review Concepts	BI3 Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.	The student can translate an observed chemical change into a balanced chemical equation and justify the choice of equation type (molecular, ionic, or net ionic) in terms of utility for the given circumstances. [See SP1.5, 7.1]	LO3.2
Science	AP Chemistry	HS	Unit 1: Introduction and Review Concepts	BI3 Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.	The student is able to use stoichiometric calculations to predict the results of performing a reaction in the laboratory and/or to analyze deviations from the expected results. [SeeSP2. 2,5.1]	LO3.3
Science	AP Chemistry	HS	Unit 1: Introduction and Review Concepts	BI3 Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.	The student is able to relate quantities (measured mass of substances, volumes of solutions, or volumes and pressures of gases) to identify stoichiometric relationships for a reaction, including situations involving limiting reactants and situations in which the reaction has not gone to completion. [See SP2. 2,5.1,6.4]	LO3.4
Science	AP Chemistry	HS	Unit 1: Introduction and Review Concepts	BI3 Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.	The student is able to use data from synthesis or decomposition of a compound to confirm the conservation of matter and the law of definite proportions. [See SP2.2,6.1]	LO3.6

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	AP Chemistry	HS	Unit 1: Introduction and Review Concepts	BI3 Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.	The student is able to evaluate the classification of a process as a physical change, chemical change, or ambiguous change based on both macroscopic observations and the distinction between rearrangement of covalent interactions and noncovalent interactions. [See SP1.4, 6.1, connects to 5.D.2]	LO3.10
Science	AP Chemistry	HS	Unit 2: Aqueous Reactions and Solution Stoichiometry	BI1 The chemical elements are fundamental building materials of matter, and all matter can be understood in terms of arrangements of atoms. These atoms retain their identity in chemical reactions.	The student can design, and/or interpret data from, an experiment that uses gravimetric analysis to determine the concentration of an analyte in a solution. [See SP4.2, 5.1, 6.4]	LO1.19
Science	AP Chemistry	HS	Unit 2: Aqueous Reactions and Solution Stoichiometry	BI3 Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.	The student can translate an observed chemical change into a balanced chemical equation and justify the choice of equation type (molecular, ionic, or net ionic) in terms of utility for the given circumstances. [See SP1.5, 7]	LO3.2
Science	AP Chemistry	HS	Unit 2: Aqueous Reactions and Solution Stoichiometry	BI3 Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.	The student is able to use stoichiometric calculations to predict the results of performing a reaction in the laboratory and/or to analyze deviations from the expected results. [SeeSP2. 2,5.1]	LO3.3
Science	AP Chemistry	HS	Unit 3: Thermochemistry	BI3 Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.	The student is able to interpret observations regarding macroscopic energy changes associated with a reaction or process to generate a relevant symbolic and/or graphical representation of the energy changes. [See SP1.5, 4.4]	LO3.11
Science	AP Chemistry	HS	Unit 3: Thermochemistry	BI5 The laws of thermodynamics describe the essential role of energy and explain and predict the direction of changes in matter.	The student is able to relate temperature to the motions of particles, either via particulate representations, such as drawings of particles with arrows indicating velocities, and/or via representations of average kinetic energy and distribution of kinetic energies of the particles, such as plots of the Maxwell Boltzmann distribution. [See SP1.1, 1.4, 7.1]	LO5.2

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	AP Chemistry	HS	Unit 3: Thermochemistry	BI5 The laws of thermodynamics describe the essential role of energy and explain and predict the direction of changes in matter.	The student is able to use calculations or estimations to relate energy changes associated with heating/cooling a substance to the heat capacity, relate energy changes associated with a phase transition to the enthalpy of fusion/vaporization, relate energy changes associated with a chemical reaction to the enthalpy of the reaction, and relate energy changes to P∆V work. [See SP2.2, 2.3]	LO5.6
Science	AP Chemistry	HS	Unit 3: Thermochemistry	BI5 The laws of thermodynamics describe the essential role of energy and explain and predict the direction of changes in matter.	The student is able to design and/or interpret the results of an experiment in which calorimetry is used to determine the change in enthalpy of a chemical process (heating/cooling, phase transition, or chemical reaction) at constant pressure. [See SP4.2, 5.1, 6.4]	LO5.7
Science	AP Chemistry	HS	Unit 4: Electronic Structure of Atoms and Periodic Properties of the Elements	BI1 The chemical elements are fundamental building materials of matter, and all matter can be understood in terms of arrangements of atoms. These atoms retain their identity in chemical reactions.	Students can justify with evidence the arrangement of the periodic table and can apply periodic properties to chemical reactivity. [See SP6.1]	LO1.10
Science	AP Chemistry	HS	Unit 4: Electronic Structure of Atoms and Periodic Properties of the Elements	BI1 The chemical elements are fundamental building materials of matter, and all matter can be understood in terms of arrangements of atoms. These atoms retain their identity in chemical reactions.	The student can justify the selection of a particular type of spectroscopy to measure properties associated with vibrational or electronic motions of molecules. [See SP4.1, 6.4]	LO1.15
Science	AP Chemistry	HS	Unit 4: Electronic Structure of Atoms and Periodic Properties of the Elements	BI1 The chemical elements are fundamental building materials of matter, and all matter can be understood in terms of arrangements of atoms. These atoms retain their identity in chemical reactions.	The student can design and/or interpret the results of an experiment regarding the absorption of light to determine the concentration of an absorbing species in a solution. [See SP4.2, 5.1]	LO1.16
Science	AP Chemistry	HS	Unit 4: Electronic Structure of Atoms and Periodic Properties of the Elements	BI2 Chemical and physical properties of materials can be explained by the structure and the arrangement of atoms, ions, or molecules and the forces between them.	The student can predict the type of bonding present between two atoms in a binary compound based on position in the periodic table and the electronegativity of the elements. [See SP6.4]	LO2.17
Science	AP Chemistry	HS	Unit 4: Electronic Structure of Atoms and Periodic Properties of the Elements	BI3 Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.	The student is able to use stoichiometric calculations to predict the results of performing a reaction in the laboratory and/or to analyze deviations from the expected results. [SeeSP2. 2,5.1]	LO3.3

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	AP Chemistry	HS	Unit 4: Electronic Structure of Atoms and Periodic Properties of the Elements	BI3 Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.	The student is able to relate quantities (measured mass of substances, volumes of solutions, or volumes and pressures of gases) to identify stoichiometric relationships for a reaction, including situations involving limiting reactants and situations in which the reaction has not gone to completion. [SeeSP2. 2,5.1,6.4]	LO3.4
Science	AP Chemistry	HS	Unit 4: Electronic Structure of Atoms and Periodic Properties of the Elements	BI3 Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.	The student is able to design a plan in order to collect data on the synthesis or decomposition of a compound to confirm the conservation of matter and the law of definite proportions. [SeeSP2.1,4.2,6.4]	LO3.5
Science	AP Chemistry	HS	Unit 5: Basic Concepts of Chemical Bonding and Molecular Geometry	BI2 Chemical and physical properties of materials can be explained by the structure and the arrangement of atoms, ions, or molecules and the forces between them.	The student is able to use Lewis diagrams and VSEPR to predict the geometry of molecules, identify hybridization, and make predictions about polarity. [See SP1.4]	LO2.21
Science	AP Chemistry	HS	Unit 6: Gases	BI2 Chemical and physical properties of materials can be explained by the structure and the arrangement of atoms, ions, or molecules and the forces between them.	The student is able to use KMT and concepts of intermolecular forces to make predictions about the macroscopic properties of gases, including both ideal and nonideal behaviors. [See SP1.4, 6.4]	LO2.4
Science	AP Chemistry	HS	Unit 6: Gases	BI2 Chemical and physical properties of materials can be explained by the structure and the arrangement of atoms, ions, or molecules and the forces between them.	The student is able to refine multiple representations of a sample of matter in the gas phase to accurately represent the effect of changes in macroscopic properties on the sample. [See SP1.3, 6.4, 7.2]	LO2.5
Science	AP Chemistry	HS	Unit 6: Gases	BI2 Chemical and physical properties of materials can be explained by the structure and the arrangement of atoms, ions, or molecules and the forces between them.	The student can apply mathematical relationships or estimation to determine macroscopic variables for ideal gases. [See SP2.2, 2.3]	LO2.6
Science	AP Chemistry	HS	Unit 7: Intermolecular Forces, Liquids and Solids	BI2 Chemical and physical properties of materials can be explained by the structure and the arrangement of atoms, ions, or molecules and the forces between them.	The student is able to use aspects of particulate models (i.e., particle spacing, motion, and forces of attraction) to reason about observed differences between solid and liquid phases and among solid and liquid materials. [See SP6.4, 7.1]	LO2.3

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	AP Chemistry	HS	Unit 7: Intermolecular Forces, Liquids and Solids	BI2 Chemical and physical properties of materials can be explained by the structure and the arrangement of atoms, ions, or molecules and the forces between them.	The student is able to explain the properties (phase, vapor pressure, viscosity, etc.) of small and large molecular compounds in terms of the strengths and types of intermolecular forces. [See SP6.2]	LO2.16
Science	AP Chemistry	HS	Unit 8: Properties of Solutions	BI1 The chemical elements are fundamental building materials of matter, and all matter can be understood in terms of arrangements of atoms. These atoms retain their identity in chemical reactions.	The student can design, and/or interpret data from, an experiment that uses gravimetric analysis to determine the concentration of an analyte in a solution. [See SP4.2, 5.1, 6.4]	LO1.19
Science	AP Chemistry	HS	Unit 8: Properties of Solutions	BI1 The chemical elements are fundamental building materials of matter, and all matter can be understood in terms of arrangements of atoms. These atoms retain their identity in chemical reactions.	The student can design, and/or interpret data from, an experiment that uses titration to determine the concentration of an analyte in a solution. [See SP4.2, 5.1, 6.4]	LO1.20
Science	AP Chemistry	HS	Unit 8: Properties of Solutions	BI2 Chemical and physical properties of materials can be explained by the structure and the arrangement of atoms, ions, or molecules and the forces between them.	The student is able to describe the relationships between the structural features of polar molecules and the forces of attraction between the particles. [See SP1.4, 6.4]	LO2.13
Science	AP Chemistry	HS	Unit 8: Properties of Solutions	BI2 Chemical and physical properties of materials can be explained by the structure and the arrangement of atoms, ions, or molecules and the forces between them.	The student is able to apply Coulomb’s law qualitatively (including using representations) to describe the interactions of ions, and the attractions between ions and solvents to explain the factors that contribute to the solubility of ionic compounds. [See SP1.4, 6.4]	LO2.14
Science	AP Chemistry	HS	Unit 8: Properties of Solutions	BI2 Chemical and physical properties of materials can be explained by the structure and the arrangement of atoms, ions, or molecules and the forces between them.	The student is able to explain observations regarding the solubility of ionic solids and molecules in water and other solvents on the basis of particle views that include intermolecular interactions and entropic effects	LO2.15
Science	AP Chemistry	HS	Unit 8: Properties of Solutions	BI6 Any bond or intermolecular attraction that can be formed can be broken. These two processes are in a dynamic competition, sensitive to initial conditions and external perturbations.	The student is able to, given a set of experimental observations regarding physical, chemical, biological, or environmental processes that are reversible, construct an explanation that connects the observations to the reversibility of the underlying chemical reactions or processes. [See SP6.2]	LO6.1

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	AP Chemistry	HS	Unit 9: Chemical Kinetics	BI4 Rates of chemical reactions are determined by details of the molecular collisions.	The student is able to design and/or interpret the results of an experiment regarding the factors (i.e., temperature, concentration, surface area) that may influence the rate of a reaction. [See SP4.2, 5.1]	LO4.1
Science	AP Chemistry	HS	Unit 9: Chemical Kinetics	BI4 Rates of chemical reactions are determined by details of the molecular collisions.	The student is able to analyze concentration vs. time data to determine the rate law for a zeroth-, first-, or second-order reaction. [See SP5.1, 6.4,connects to 4.A.3]	LO4.2
Science	AP Chemistry	HS	Unit 9: Chemical Kinetics	BI4 Rates of chemical reactions are determined by details of the molecular collisions.	The student is able to connect the half-life of a reaction to the rate constant of a first-order reaction and justify the use of this relation in terms of the reaction being a first-order reaction. [See SP2.1, 2.2]	LO4.3
Science	AP Chemistry	HS	Unit 9: Chemical Kinetics	BI4 Rates of chemical reactions are determined by details of the molecular collisions.	The student is able to connect the rate law for an elementary reaction to the frequency and success of molecular collisions, including connecting the frequency and success to the order and rate constant, respectively. [See SP7.1,connects to 4.A.3, 4.B.2]	LO4.4
Science	AP Chemistry	HS	Unit 9: Chemical Kinetics	BI4 Rates of chemical reactions are determined by details of the molecular collisions.	The student is able to explain the difference between collisions that convert reactants to products and those that do not in terms of energy distributions and molecular orientation. [See SP6.2]	LO4.5
Science	AP Chemistry	HS	Unit 9: Chemical Kinetics	BI4 Rates of chemical reactions are determined by details of the molecular collisions.	The student is able to use representations of the energy profile for an elementary reaction (from the reactants, through the transition state, to the products) to make qualitative predictions regarding the relative temperature dependence of the reaction rate. [See SP1.4, 6.4]	LO4.6
Science	AP Chemistry	HS	Unit 9: Chemical Kinetics	BI4 Rates of chemical reactions are determined by details of the molecular collisions.	The student is able to evaluate alternative explanations, as expressed by reaction mechanisms, to determine which are consistent with data regarding the overall rate of a reaction, and data that can be used to infer the presence of a reaction intermediate. [See SP6.5,connects to 4.C.1, 4.C.2, 4.C.3]	LO4.7
Science	AP Chemistry	HS	Unit 9: Chemical Kinetics	BI4 Rates of chemical reactions are determined by details of the molecular collisions.	The student can translate among reaction energy profile representations, particulate representations, and symbolic representations (chemical equations) of a chemical reaction occurring in the presence and absence of a catalyst. [See SP1.5]	LO4.8

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	AP Chemistry	HS	Unit 9: Chemical Kinetics	BI4 Rates of chemical reactions are determined by details of the molecular collisions.	The student is able to explain changes in reaction rates arising from the use of acid-base catalysts, surface catalysts, or enzyme catalysts, including selecting appropriate mechanisms with or without the catalyst present. [See SP6.2, 7.2]	LO4.9
Science	HS	Anatomy & Physiology 1	Unit 1	HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).	BIO.A.1.2.2
Science	HS	Anatomy & Physiology 1	Unit 1	HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	Explain how organisms maintain homeostasis (e.g., thermoregulation, water regulation, oxygen regulation).	BIO.A.4.2.1
Science	HS	Anatomy & Physiology 1	Unit 1	CC3.3.12 Biological Sciences	Define anatomy and physiology.	CYSCAI.3.3.12.A.01
Science	HS	Anatomy & Physiology 1	Unit 1	CC3.3.12 Biological Sciences	Define anatomical and directional terms used in association with the human body.	CYSCAI.3.3.12.A.02
Science	HS	Anatomy & Physiology 1	Unit 2: Histology	HS-LS1-2.Develop and use a model to Illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).	BIO.A.1.2.2
Science	HS	Anatomy & Physiology 1	Unit 2: Histology	CC3.3.12 Biological Sciences	Compare and contrast the distinguishing characteristics of the four primary tissues.	CYSCAI.3.3.12.A.03
Science	HS	Anatomy & Physiology 1	Unit 2: Histology	CC3.3.12 Biological Sciences	Describe the structure and functions for the various types of epithelium.	CYSCAI.3.3.12.A.04
Science	HS	Anatomy & Physiology 1	Unit 2: Histology	CC3.3.12 Biological Sciences	Explain the structure and functions of various types of connective tissues.	CYSCAI.3.3.12.A.05
Science	HS	Anatomy & Physiology 1	Unit 2: Histology	CC3.3.12 Biological Sciences	Contrast the three types of muscle tissues with regard to structure, functions, and modes of control.	CYSCAI.3.3.12.A.06
Science	HS	Anatomy & Physiology 1	Unit 2: Histology	CC3.3.12 Biological Sciences	Describe the structural features and functions of nervous tissue.	CYSCAI.3.3.12.A.07
Science	HS	Anatomy & Physiology 1	Unit 2: Histology	CC3.3.12 Biological Sciences	Explain the differences between normal cells and various types of cancerous cells.	CYSCAI.3.3.12.A.08
Science	HS	Anatomy & Physiology 1	Unit 2: Histology	CC3.3.12 Biological Sciences	Assess the role of genetics and the environment in the formation of cancer.	CYSCAI.3.3.12.A.09
Science	HS	Anatomy & Physiology 1	Unit 3: Integumentary System	HS-LS1-2.Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).	BIO.A.1.2.2

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Anatomy & Physiology 1	Unit 3: Integumentary System	CC3.3.12 Biological Sciences	Identify the structure and functions of the integumentary system.	CYSCAI.3.3.12.A.10
Science	HS	Anatomy & Physiology 1	Unit 3: Integumentary System	CC3.3.12 Biological Sciences	Explain the role of the integumentary system in maintaining body temperature.	CYSCAI.3.3.12.A.11
Science	HS	Anatomy & Physiology 1	Unit 3: Integumentary System	CC3.3.12 Biological Sciences	Describe the structure, distribution, and functions of hair and the various glands found in the skin.	CYSCAI.3.3.12.A.12
Science	HS	Anatomy & Physiology 1	Unit 3: Integumentary System	CC3.3.12 Biological Sciences	Describe the structure, location, and functions of skin receptors.	CYSCAI.3.3.12.A.13
Science	HS	Anatomy & Physiology 1	Unit 3: Integumentary System	CC3.3.12 Biological Sciences	Define a burn and classify burns into first, second, and third degree.	CYSCAI.3.3.12.A.14
Science	HS	Anatomy & Physiology 1	Unit 3: Integumentary System	CC3.3.12 Biological Sciences	Compare and contrast the three types of skin cancer with regard to occurrence and treatment.	CYSCAI.3.3.12.A.15
Science	HS	Anatomy & Physiology 1	Unit 3: Integumentary System	CC3.3.12 Biological Sciences	Describe the process of repair involved in a superficial and deep wound.	CYSCAI.3.3.12.A.17
Science	HS	Anatomy & Physiology 1	Unit 3: Integumentary System	CC3.3.12 Biological Sciences	Investigate the causes and effects of selected skin disorders.	CYSCAI.3.3.12.A.18
Science	HS	Anatomy & Physiology 1	Unit 3: Integumentary System	CC3.3.12 Biological Sciences	Describe the effects of aging on the integumentary system.	CYSCAI.3.3.12.A.19
Science	HS	Anatomy & Physiology 1	Unit 4: Skeletal System	HS-LS1-1.Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.	Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).	BIO.A.1.2.2
Science	HS	Anatomy & Physiology 1	Unit 4: Skeletal System	CC3.3.12 Biological Sciences	Discuss the structure and functions of the skeletal system.	CYSCAI.3.3.12.A.20
Science	HS	Anatomy & Physiology 1	Unit 4: Skeletal System	CC3.3.12 Biological Sciences	Describe the histological features of compact and spongy bone.	CYSCAI.3.3.12.A.21
Science	HS	Anatomy & Physiology 1	Unit 4: Skeletal System	CC3.3.12 Biological Sciences	Identify the major types of bones and describe the structural features of each type.	CYSCAI.3.3.12.A.22
Science	HS	Anatomy & Physiology 1	Unit 4: Skeletal System	CC3.3.12 Biological Sciences	Identify the bones of the skull and their structural features.	CYSCAI.3.3.12.A.23
Science	HS	Anatomy & Physiology 1	Unit 4: Skeletal System	CC3.3.12 Biological Sciences	Study the bones of the thorax and their principal markings.	CYSCAI.3.3.12.A.24
Science	HS	Anatomy & Physiology 1	Unit 4: Skeletal System	CC3.3.12 Biological Sciences	Identify the bones of the pectoral girdle and the pelvic girdle and their principal markings.	CYSCAI.3.3.12.A.25
Science	HS	Anatomy & Physiology 1	Unit 4: Skeletal System	CC3.3.12 Biological Sciences	Identify the bones of the upper and lower appendages and their principal markings.	CYSCAI.3.3.12.A.26
Science	HS	Anatomy & Physiology 1	Unit 4: Skeletal System	CC3.3.12 Biological Sciences	Explain the structural features and importance of the arches of the foot.	CYSCAI.3.3.12.A.27

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Anatomy & Physiology 1	Unit 4: Skeletal System	CC3.3.12 Biological Sciences	Examine the structure and function of various types joints.	CYSCAI.3.3.12.A.28
Science	HS	Anatomy & Physiology 1	Unit 4: Skeletal System	CC3.3.12 Biological Sciences	Identify several types of synovial articulations.	CYSCAI.3.3.12.A.29
Science	HS	Anatomy & Physiology 1	Unit 4: Skeletal System	CC3.3.12 Biological Sciences	Discuss types of fractures and explain the sequence of events involved in fracture repair.	CYSCAI.3.3.12.A.30
Science	HS	Anatomy & Physiology 1	Unit 5: Muscles	HS-LS1-2.Develop and use a model to illustrate the hierarchical organization of interacting systems that providespecific functions within multicellular organisms.	Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).	BIO.A.1.2.2
Science	HS	Anatomy & Physiology 1	Unit 5: Muscles	CC3.3.12 Biological Sciences	Describe the relationship between bones and skeletal muscles in producing body movements.	CYSCAI.3.3.12.A.31
Science	HS	Anatomy & Physiology 1	Unit 5: Muscles	CC3.3.12 Biological Sciences	Locate and name the principal superficial muscles of the human body.	CYSCAI.3.3.12.A.32
Science	HS	Anatomy & Physiology 1	Unit 5: Muscles	CC3.3.12 Biological Sciences	Describe the anatomy of a skeletal muscle.	CYSCAI.3.3.12.A.33
Science	HS	Anatomy & Physiology 1	Unit 5: Muscles	CC3.3.12 Biological Sciences	Describe the structure and importance of a neuromuscular junction.	CYSCAI.3.3.12.A.34
Science	HS	Anatomy & Physiology 1	Unit 5: Muscles	CC3.3.12 Biological Sciences	Contrast the three types of muscle tissues with regard to structure and function.	CYSCAI.3.3.12.A.35
Science	HS	Anatomy & Physiology 1	Unit 5: Muscles	CC3.3.12 Biological Sciences	Examine the properties of a muscle contraction (including the sliding filament theory).	CYSCAI.3.3.12.A.36
Science	HS	Anatomy & Physiology 1	Unit 6: Nervous System	HS-LS1-2.Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).	BIO.A.1.2.2
Science	HS	Anatomy & Physiology 1	Unit 6: Nervous System	CC3.3.12 Biological Sciences	Contrast the two major divisions of the nervous system and their respective parts and functions.	CYSCAI.3.3.12.A.38
Science	HS	Anatomy & Physiology 1	Unit 6: Nervous System	CC3.3.12 Biological Sciences	Describe the functions of nervous tissue.	CYSCAI.3.3.12.A.39
Science	HS	Anatomy & Physiology 1	Unit 6: Nervous System	CC3.3.12 Biological Sciences	Explain what occurs during a reflex arc.	CYSCAI.3.3.12.A.42
Science	HS	Anatomy & Physiology 1	Unit 6: Nervous System	CC3.3.12 Biological Sciences	Examine the blood supply to the brain and the concept of the blood-brain barrier.	CYSCAI.3.3.12.A.43
Science	HS	Anatomy & Physiology 1	Unit 6: Nervous System	CC3.3.12 Biological Sciences	Explain the structure and function of the brain (via sheep brain dissection).	CYSCAI.3.3.12.A.44
Science	HS	Anatomy & Physiology 1	Unit 6: Nervous System	CC3.3.12 Biological Sciences	Study the symptoms and treatment of major disorders of the nervous system.	CYSCAI.3.3.12.A.45

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Anatomy & Physiology 2	Unit 1: Review and Nervous System Part II	HS-LS1-2.Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms)	BIO.A.1.2.2
Science	HS	Anatomy & Physiology 2	Unit 1: Review and Nervous System Part II	CC3.3.12 Biological Sciences	Define anatomical and directional terms used in association with the human body.	CYSCAII. 3.3.12.A.02
Science	HS	Anatomy & Physiology 2	Unit 1: Review and Nervous System Part II	CC3.3.12 Biological Sciences	Compare and contrast the distinguishing characteristics of the four primary tissues.	CYSCAII. 3.3.12.A.03
Science	HS	Anatomy & Physiology 2	Unit 1: Review and Nervous System Part II	CC3.3.12 Biological Sciences	Contrast the three types of muscle tissues with regard to structure, functions, and modes of control.	CYSCAII. 3.3.12.A.06
Science	HS	Anatomy & Physiology 2	Unit 1: Review and Nervous System Part II	CC3.3.12 Biological Sciences	Describe the structural features and functions of nervous tissue.	CYSCAII. 3.3.12.A.07
Science	HS	Anatomy & Physiology 2	Unit 1: Review and Nervous System Part II	CC3.3.12 Biological Sciences	Identify the three basic functions of the nervous system in maintaining homeostasis.	CYSCAII. 3.3.12.A.37
Science	HS	Anatomy & Physiology 2	Unit 1: Review and Nervous System Part II	CC3.3.12 Biological Sciences	Explain the sequence of events involved in the generation and conduction of a nerve impulse.	CYSCAII. 3.3.12.A.40
Science	HS	Anatomy & Physiology 2	Unit 1: Review and Nervous System Part II	CC3.3.12 Biological Sciences	Compare and contrast a nerve impulse and a muscle contraction.	CYSCAII. 3.3.12.A.41
Science	HS	Anatomy & Physiology 2	Unit 2: Senses	HS-LS1-3.Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	Explain how organisms maintain homeostasis (e.g., thermoregulation, water regulation, oxygen regulation).	BIO.A.4.2.1
Science	HS	Anatomy & Physiology 2	Unit 2: Senses	CC3.3.12 Biological Sciences	Explain the structure and function of the eye (via cow eye dissection).	CYSCAII. 3.3.12.A.46
Science	HS	Anatomy & Physiology 2	Unit 2: Senses	CC3.3.12 Biological Sciences	Explain the sequence of events involved in the generation and conduction of a nerve impulse.	CYSCAII. 3.3.12.A.40
Science	HS	Anatomy & Physiology 2	Unit 2: Senses	CC3.3.12 Biological Sciences	Identify the categories of sensory receptors and their actions.	CYSCAII. 2.1.4.44
Science	HS	Anatomy & Physiology 2	Unit 2: Senses	CC3.3.12 Biological Sciences	Describe the structure and functions of the parts of the ear involved in hearing and equilibrium.	CYSCAII. 2.1.4.45
Science	HS	Anatomy & Physiology 2	Unit 2: Senses	CC3.3.12 Biological Sciences	Describe the structure and functions of the parts of the eye involved in vision.	CYSCAII. 2.1.4.46
Science	HS	Anatomy & Physiology 2	Unit 3: Blood, Cardiovascular and Lymphatic System	HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.	Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).	BIO.A.1.2.2

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Anatomy & Physiology 2	Unit 3: Blood, Cardiovascular and Lymphatic System	CC3.3.12 Biological Sciences	Describe the structure and functions of the heart (via fetal pig dissection).	CYSCAII. 3.3.12.A.47
Science	HS	Anatomy & Physiology 2	Unit 3: Blood, Cardiovascular and Lymphatic System	CC3.3.12 Biological Sciences	Compare the structure and function of the major blood vessels that form the vascular system	CYSCAII. 3.3.12.A.48
Science	HS	Anatomy & Physiology 2	Unit 3: Blood, Cardiovascular and Lymphatic System	CC3.3.12 Biological Sciences	Describe the structure and functions of the lymph system	CYSCAII. 3.3.12.A.49
Science	HS	Anatomy & Physiology 2	Unit 3: Blood, Cardiovascular and Lymphatic System	CC3.3.12 Biological Sciences	Demonstrate an understanding of how structure is related to function in all living things.	CYSCAII.2.1.4
Science	HS	Anatomy & Physiology 2	Unit 3: Blood, Cardiovascular and Lymphatic System	CC3.3.12 Biological Sciences	Differentiate between open and closed circulatory systems and compare them with respect to speed and efficiency.	CYSCAII. 2.1.4.21
Science	HS	Anatomy & Physiology 2	Unit 3: Blood, Cardiovascular and Lymphatic System	CC3.3.12 Biological Sciences	Describe the principal parts of the human heart and its major blood vessels.	CYSCAII. 2.1.4.22
Science	HS	Anatomy & Physiology 2	Unit 3: Blood, Cardiovascular and Lymphatic System	CC3.3.12 Biological Sciences	Discuss the structure and function of arteries, veins, and capillaries.	CYSCAII. 2.1.4.23
Science	HS	Anatomy & Physiology 2	Unit 3: Blood, Cardiovascular and Lymphatic System	CC3.3.12 Biological Sciences	Name the substances that make up blood, the constituents of the plasma, the cells, and the solid components.	CYSCAII. 2.1.4.24
Science	HS	Anatomy & Physiology 2	Unit 3: Blood, Cardiovascular and Lymphatic System	CC3.3.12 Biological Sciences	Demonstrate an understanding of how certain processes or parts regulate the activities inside a living thing.	CYSCAII.2.1.5
Science	HS	Anatomy & Physiology 2	Unit 3: Blood, Cardiovascular and Lymphatic System	CC3.3.12 Biological Sciences	Discuss the events that take place during one cycle of contraction and relaxation of the heart.	CYSCAII. 2.1.5.24
Science	HS	Anatomy & Physiology 2	Unit 3: Blood, Cardiovascular and Lymphatic System	CC3.3.12 Biological Sciences	Describe the factors that affect blood flow and blood pressure.	CYSCAII. 2.1.5.25
Science	HS	Anatomy & Physiology 2	Unit 3: Blood, Cardiovascular and Lymphatic System	CC3.3.12 Biological Sciences	Explain how water and dissolved materials are forced out of the capillaries at the arteriole end and into the capillaries at the venule end.	CYSCAII. 2.1.5.26
Science	HS	Anatomy & Physiology 2	Unit 4: Digestive System	HS-LS1-2.Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).	BIO.A.1.2.2
Science	HS	Anatomy & Physiology 2	Unit 4: Digestive System	HS-LS1-2.Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	Compare the structure and function of carbohydrates, lipids, proteins, and nucleic acids in organisms.	BIO.A.2.2.3

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Anatomy & Physiology 2	Unit 4: Digestive System	HS-LS1-2.Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	Explain mechanisms that permit organisms to maintain biological balance between their internal and external environments.	BIO.A.4.2
Science	HS	Anatomy & Physiology 2	Unit 4: Digestive System	CC3.3.12 Biological Sciences	Identify the main and accessory organs of digestion and their functions.	CYSCAII. 3.3.12.A.51
Science	HS	Anatomy & Physiology 2	Unit 4: Digestive System	CC3.3.12 Biological Sciences	Describe how the end products of digestion are absorbed and excreted.	CYSCAII. 3.3.12.A.52
Science	HS	Anatomy & Physiology 2	Unit 4: Digestive System	CC3.3.12 Biological Sciences	Compare the structure and function of carbohydrates, lipids, proteins, and nucleic acids in organisms.	BIO.A.2.2.3
Science	HS	Anatomy & Physiology 2	Unit 4: Digestive System	CC3.3.12 Biological Sciences	Explain mechanisms that permit organisms to maintain biological balance between their internal and external environments.	BIO.A.4.2
Science	HS	Anatomy & Physiology 2	Unit 5: Respiratory System	HS-LS1-2.Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).	BIO.A.1.2.2
Science	HS	Anatomy & Physiology 2	Unit 5: Respiratory System	HS-LS1-2.Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	Identify and describe the cell structures involved in transport of materials into, out of, and throughout a cell.	BIO.A.4.1
Science	HS	Anatomy & Physiology 2	Unit 5: Respiratory System	HS-LS1-2.Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	Compare the mechanisms that transport materials across the plasma membrane (i.e., passive transport—diffusion, osmosis, facilitated diffusion; and active transport—pumps, endocytosis, exocytosis).	BIO.A.4.1.2
Science	HS	Anatomy & Physiology 2	Unit 5: Respiratory System	CC3.3.12 Biological Sciences	Identify the organs of the respiratory system and describe their functions	CYSCAII. 3.3.12.A.50
Science	HS	Anatomy & Physiology 2	Unit 6: Urinary System	HS-LS1-3.Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).	BIO.A.1.2.2
Science	HS	Anatomy & Physiology 2	Unit 6: Urinary System	HS-LS1-3.Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	Compare and contrast the mechanisms that transport materials across the plasma membrane (i.e., passive transport -- diffusion, osmosis, facilitated diffusion; active transport -- pumps, endocytosis, exocytosis).	BIO.A.4.1.2

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Anatomy & Physiology 2	Unit 6: Urinary System	HS-LS1-3.Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	Explain how organisms maintain homeostasis (e.g., thermoregulation, water regulation, oxygen regulation).	BIO.A.4.2.1
Science	HS	Anatomy & Physiology 2	Unit 6: Urinary System	CC3.3.12 Biological Sciences	Describe the external and internal anatomy of the kidney.	CYSCAII. 3.3.12.A.53
Science	HS	Anatomy & Physiology 2	Unit 6: Urinary System	CC3.3.12 Biological Sciences	Relate the parts of the kidney and urinary tract to their functions.	CYSCAII. 3.3.12.A.54
Science	HS	Anatomy & Physiology 2	Unit 6: Urinary System	CC3.3.12 Biological Sciences	Examine the physical characteristics and formation of urine.	CYSCAII. 3.3.12.A.55
Science	HS	Anatomy & Physiology 2	Unit 7: Reproductive System	HS-LS1-2.Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	Describe the events that occur during the cell cycle: interphase, nuclear division (i.e., mitosis or meiosis), cytokinesis.	BIO.B.1.1.1
Science	HS	Anatomy & Physiology 2	Unit 7: Reproductive System	HS-LS1-2.Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).	BIO.A.1.2.2
Science	HS	AP Bio	Unit 1 - Science of Biology	EK1.B.2: Phylogenetic trees and cladograms are graphical representations (models) of evolutionary history that can be tested.	Pose scientific questions about a group of organisms whose relatedness is described by a phylogenetic tree or cladogram in order to (1) identify shared characteristics, (2) make inferences about the evolutionary history of the group, and (3) identify character data that could extend or improve the phylogenetic tree.	LO1.17
Science	HS	AP Bio	Unit 1 - Science of Biology	EK1.B.2: Phylogenetic trees and cladograms are graphical representations (models) of evolutionary history that can be tested.	Evaluate evidence provided by a data set in conjunction with a phylogenetic tree or a simple cladogram to determine evolutionary history and speciation.	LO1.18
Science	HS	AP Bio	Unit 1 - Science of Biology	EK1.B.2: Phylogenetic trees and cladograms are graphical representations (models) of evolutionary history that can be tested.	Create a phylogenetic tree or simple cladogram that correctly represents evolutionary history and speciation from a provided data set.	LO1.19
Science	HS	AP Bio	Unit 1 - Science of Biology	EK2.D.2: Homeostatic mechanisms reflect both common ancestry and divergence due to adaptation in different environments.	Construct explanations based on scientific evidence that homeostatic mechanisms reflect continuity due to common ancestry and/or divergence due to adaptation in different environments.	LO2.25

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	AP Bio	Unit 1 - Science of Biology	EK2.D.2: Homeostatic mechanisms reflect both common ancestry and divergence due to adaptation in different environments.	Analyze data to identify phylogenetic patterns or relationships, showing that homeostatic mechanisms reflect both continuity due to common ancestry and change due to evolution in different environments.	LO2.26
Science	HS	AP Bio	Unit 1 - Science of Biology	EK2.D.2: Homeostatic mechanisms reflect both common ancestry and divergence due to adaptation in different environments.	Connect differences in the environment with the evolution of homeostatic mechanisms.	LO2.27
Science	HS	AP Bio	Unit 1 - Science of Biology	EK1.B.1: Organisms share many conserved core processes and features that evolved and are widely distributed among organisms today.	Justify the scientific claim that organisms share many conserved core processes and features that evolved and are widely distributed among organisms today.	LO1.16
Science	HS	AP Bio	Unit 1 - Science of Biology	EK1.C.1: Speciation and extinction have occurred throughout the Earth's history.	Analyze data related to questions of speciation and extinction throughout the Earth's history.	LO1.20
Science	HS	AP Bio	Unit 1 - Science of Biology	EK1.C.1: Speciation and extinction have occurred throughout the Earth's history.	Design a plan for collecting data to investigate the scientific claim that speciation and extinction have occurred throughout the Earth's history.	LO1.21
Science	HS	AP Bio	Unit 1 - Science of Biology	EK1.C.2: Speciation may occur when two populations become reproductively isolated from each other.	Use data from a real or simulated population(s), based on graphs or models of types of selection, to predict what will happen to the population in the future.	LO1.22
Science	HS	AP Bio	Unit 1 - Science of Biology	EK1.C.2: Speciation may occur when two populations become reproductively isolated from each other.	Justify the selection of data that address questions related to reproductive isolation and speciation.	LO1.23
Science	HS	AP Bio	Unit 1 - Science of Biology	EK1.C.2: Speciation may occur when two populations become reproductively isolated from each other.	Describe speciation in an isolated population and connect it to change in gene frequency, change in environment, natural selection and/or genetic drift.	LO1.24
Science	HS	AP Bio	Unit 1 - Science of Biology	EK1.C.3: Populations of organisms continue to evolve.	Describe a model that represents evolution within a population.	LO1.25
Science	HS	AP Bio	Unit 1 - Science of Biology	EK1.C.3: Populations of organisms continue to evolve.	Evaluate given data sets that illustrate evolution as an ongoing process.	LO1.26
Science	HS	AP Bio	Unit 1 - Science of Biology	EK3.D.1: Cell communication processes share common features that reflect a shared evolutionary history.	Describe basic chemical processes for cell communication shared across evolutionary lines of descent.	LO3.31
Science	HS	AP Bio	Unit 1 - Science of Biology	EK3.D.1: Cell communication processes share common features that reflect a shared evolutionary history.	Generate scientific questions involving cell communication as it relates to the process of evolution.	LO3.32

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	AP Bio	Unit 1 - Science of Biology	EK3.D.1: Cell communication processes share common features that reflect a shared evolutionary history.	Use representation(s) and appropriate models to describe features of a cell signaling pathway.	LO3.33
Science	HS	AP Bio	Unit 2 - Chemistry of Life	EK2.A.3: Organisms must exchange matter with the environment to grow, reproduce and maintain organization.	Justify the selection of data regarding the types of molecules that an animal, plant or bacterium will take up as necessary building blocks and excrete as waste products.	LO2.8
Science	HS	AP Bio	Unit 2 - Chemistry of Life	EK1.D.1: There are several hypotheses about the natural origin of life on Earth, each with supporting scientific evidence.	Describe a scientific hypothesis about the origin of life on Earth.	LO1.27
Science	HS	AP Bio	Unit 2 - Chemistry of Life	EK1.D.1: There are several hypotheses about the natural origin of life on Earth, each with supporting scientific evidence.	Evaluate scientific questions based on hypotheses about the origin of life on Earth.	LO1.28
Science	HS	AP Bio	Unit 2 - Chemistry of Life	EK1.D.1: There are several hypotheses about the natural origin of life on Earth, each with supporting scientific evidence.	Describe the reasons for revisions of scientific hypotheses of the origin of life on Earth.	LO1.29
Science	HS	AP Bio	Unit 2 - Chemistry of Life	EK1.D.1: There are several hypotheses about the natural origin of life on Earth, each with supporting scientific evidence.	Evaluate scientific hypotheses about the origin of life on Earth.	LO1.30
Science	HS	AP Bio	Unit 2 - Chemistry of Life	EK1.D.1: There are several hypotheses about the natural origin of life on Earth, each with supporting scientific evidence.	Evaluate the accuracy and legitimacy of data to answer scientific questions about the origin of life on Earth.	LO1.31
Science	HS	AP Bio	Unit 2 - Chemistry of Life	EK1.D.2: Scientific evidence from many different disciplines supports models of the origin of life.	Justify the selection of geological, physical, and chemical data that reveal early Earth conditions.	LO1.32
Science	HS	AP Bio	Unit 2 - Chemistry of Life	EK4.A.1: The subcomponents of biological molecules and their sequence determine the properties of that molecule.	Explain the connection between the sequence and the subcomponents of a biological polymer and its properties.	LO4.1
Science	HS	AP Bio	Unit 2 - Chemistry of Life	EK4.A.1: The subcomponents of biological molecules and their sequence determine the properties of that molecule.	Refine representations and models to explain how the subcomponents of a biological polymer and their sequence determine the properties of that polymer.	LO4.2
Science	HS	AP Bio	Unit 2 - Chemistry of Life	EK4.A.1: The subcomponents of biological molecules and their sequence determine the properties of that molecule.	Use models to predict and justify that changes in the subcomponents of a biological polymer affect the functionality of the molecule.	LO4.3
Science	HS	AP Bio	Unit 2 - Chemistry of Life	EK4.C.1: Variation in molecular units provides cells with a wider range of functions.	Construct explanations based on evidence of how variation in molecular units provides cells with a wider range of functions.	LO4.22

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	AP Bio	Unit 3 - Cellular Biology	EK3.C.3: Viral replication results in genetic variation, and viral infection can introduce genetic variation into the hosts.	Construct an explanation of how viruses introduce genetic variation in host organisms.	LO3.29
Science	HS	AP Bio	Unit 3 - Cellular Biology	EK3.C.3: Viral replication results in genetic variation, and viral infection can introduce genetic variation into the hosts.	Use representations and appropriate models to describe how viral replication introduces genetic variation in the viral population.	LO3.30
Science	HS	AP Bio	Unit 3 - Cellular Biology	EK1.B.1: Organisms share many conserved core processes and features that evolved and are widely distributed among organisms today.	Describe specific examples of conserved core biological processes and features shared by all domains or within one domain of life, and how these shared, conserved core processes and features support the concept of common ancestry for all organisms.	LO1.15
Science	HS	AP Bio	Unit 3 - Cellular Biology	EK2.B.3: Eukaryotic cells maintain internal membranes that partition the cell into specialized regions.	Use representations and models to describe differences in prokaryotic and eukaryotic cells.	LO2.14
Science	HS	AP Bio	Unit 3 - Cellular Biology	EK4.B.2: Cooperative interactions within organisms promote efficiency in the use of energy and matter.	Use representations and models to analyze how cooperative interactions within organisms promote efficiency in the use of energy and matter.	LO4.18
Science	HS	AP Bio	Unit 3 - Cellular Biology	EK2.B.3: Eukaryotic cells maintain internal membranes that partition the cell into specialized regions.	Explain how internal membranes and organelles contribute to cell functions.	LO2.13
Science	HS	AP Bio	Unit 3 - Cellular Biology	EK4.A.2: The structure and function of subcellular components, and their interactions, provide essential cellular processes.	Make a prediction about the interactions of subcellular organelles.	LO4.4
Science	HS	AP Bio	Unit 3 - Cellular Biology	EK4.A.2: The structure and function of subcellular components, and their interactions, provide essential cellular processes.	Construct explanations based on scientific evidence as to how interactions of subcellular structures provide essential functions.	LO4.5
Science	HS	AP Bio	Unit 3 - Cellular Biology	EK4.A.2: The structure and function of subcellular components, and their interactions, provide essential cellular processes.	Use representations and models to analyze situations qualitatively to describe how interactions of subcellular structures, which possess specialized functions, provide essential functions.	LO4.6
Science	HS	AP Bio	Unit 3 - Cellular Biology	EK2.B.1: Cell membranes are selectively permeable due to their structure.	Construct models that connect the movement of molecules across membranes with membrane structure and function.	LO2.11
Science	HS	AP Bio	Unit 3 - Cellular Biology	EK2.A.3: Organisms must exchange matter with the environment to grow, reproduce and maintain organization.	Use calculated surface area-to-volume ratios to predict which cell(s) might eliminate wastes or procure nutrients faster by diffusion.	LO2.6

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	AP Bio	Unit 3 - Cellular Biology	EK2.A.3: Organisms must exchange matter with the environment to grow, reproduce and maintain organization.	Explain how cell size and shape affect the overall rate of nutrient intake and the rate of waste elimination.	LO2.7
Science	HS	AP Bio	Unit 3 - Cellular Biology	EK2.B.1: Cell membranes are selectively permeable due to their structure.	Use representations and models to pose scientific questions about the properties of cell membranes and selective permeability based on molecular structure.	LO2.10
Science	HS	AP Bio	Unit 3 - Cellular Biology	EK2.B.2: Growth and dynamic homeostasis are maintained by the constant movement of molecules across membranes.	Use representations and models to analyze situations or solve problems qualitatively and quantitatively to investigate whether dynamic homeostasis is maintained by the active movement of molecules across membranes.	LO2.12
Science	HS	AP Bio	Unit 3 - Cellular Biology	EK2.A.3: Organisms must exchange matter with the environment to grow, reproduce and maintain organization.	Represent graphically or model quantitatively the exchange of molecules between an organism and its environment, and the subsequent use of these molecules to build new molecules that facilitate dynamic homeostasis, growth and reproduction.	LO2.9
Science	HS	AP Bio	Unit 4 - Bioenergetics	EK4.B.1: Interactions between molecules affect their structure and function.	Analyze data to identify how molecular interactions affect structure and function.	LO4.17
Science	HS	AP Bio	Unit 4 - Bioenergetics	EK2.A.1: All living systems require constant input of free energy.	Explain how biological systems use free energy based on empirical data that all organisms require constant energy input to maintain organization, to grow and to reproduce.	LO2.1
Science	HS	AP Bio	Unit 4 - Bioenergetics	EK2.A.1: All living systems require constant input of free energy.	Justify a scientific claim that free energy is required for living systems to maintain organization, to grow or to reproduce, but that multiple strategies exist in different living systems.	LO2.2
Science	HS	AP Bio	Unit 4 - Bioenergetics	EK2.A.1: All living systems require constant input of free energy.	Predict how changes in free energy availability affect organisms, populations and ecosystems.	LO2.3
Science	HS	AP Bio	Unit 4 - Bioenergetics	EK2.A.2: Organisms capture and store free energy for use in biological processes.	Use representations to pose scientific questions about what mechanisms and structural features allow organisms to capture, store and use free energy.	LO2.4
Science	HS	AP Bio	Unit 4 - Bioenergetics	EK2.A.2: Organisms capture and store free energy for use in biological processes.	Construct explanations of the mechanisms and structural features of cells that allow organisms to capture, store or use free energy.	LO2.5
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK3.D.1: Cell communication processes share common features that reflect a shared evolutionary history.	Describe basic chemical processes for cell communication shared across evolutionary lines of descent.	LO3.31

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK3.D.1: Cell communication processes share common features that reflect a shared evolutionary history.	Generate scientific questions involving cell communication as it relates to the process of evolution.	LO3.32
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK3.D.1: Cell communication processes share common features that reflect a shared evolutionary history.	Use representation(s) and appropriate models to describe features of a cell signaling pathway.	LO3.33
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK3.D.2: Cells communicate with each other through direct contact with other cells or from a distance via chemical signaling.	Construct explanations of cell communication through cell-to-cell direct contact or through chemical signaling.	LO3.34
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK3.D.2: Cells communicate with each other through direct contact with other cells or from a distance via chemical signaling.	Create representation(s) that depict how cell-to-cell communication occurs by direct contact or from a distance through chemical signaling.	LO3.35
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK3.D.3: Signal transduction pathways link signal reception with cellular response.	Describe a model that expresses the key elements of signal transduction pathways by which a signal is converted to a cellular response.	LO3.36
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK3.D.4: Changes in signal transduction pathways can alter cellular response.	Justify claims based on scientific evidence that changes in signal transduction pathways can alter cellular response.	LO3.37
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK3.D.4: Changes in signal transduction pathways can alter cellular response.	Describe a model that expresses key elements to show how change in signal transduction can alter cellular response.	LO3.38
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK3.D.4: Changes in signal transduction pathways can alter cellular response.	Construct an explanation of how certain drugs affect signal reception and, consequently, signal transduction pathways.	LO3.39
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK3.E.2: Animals have nervous systems that detect external and internal signals, transmit and integrate information, and produce responses.	Construct an explanation, based on scientific theories and models, about how nervous systems detect external and internal signals, transmit and integrate information, and produce responses.	LO3.43
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK3.E.2: Animals have nervous systems that detect external and internal signals, transmit and integrate information, and produce responses.	Describe how nervous systems detect external and internal signals.	LO3.44
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK3.E.2: Animals have nervous systems that detect external and internal signals, transmit and integrate information, and produce responses.	Describe how nervous systems transmit information.	LO3.45

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK3.E.2: Animals have nervous systems that detect external and internal signals, transmit and integrate information, and produce responses.	Describe how the vertebrate brain integrates information to produce a response.	LO3.46
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK3.E.2: Animals have nervous systems that detect external and internal signals, transmit and integrate information, and produce responses.	Create a visual representation of complex nervous systems to describe/explain how these systems detect external and internal signals, transmit and integrate information, and produce responses.	LO3.47
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK3.E.2: Animals have nervous systems that detect external and internal signals, transmit and integrate information, and produce responses.	Create a visual representation to describe how nervous systems detect external and internal signals.	LO3.48
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK3.E.2: Animals have nervous systems that detect external and internal signals, transmit and integrate information, and produce responses.	Create a visual representation to describe how nervous systems transmit information.	LO3.49
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK3.E.2: Animals have nervous systems that detect external and internal signals, transmit and integrate information, and produce responses.	Create a visual representation to describe how the vertebrate brain integrates information to produce a response.	LO3.50
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK2.B.2: Growth and dynamic homeostasis are maintained by the constant movement of molecules across membranes.	Use representations and models to analyze situations or solve problems qualitatively and quantitatively to investigate whether dynamic homeostasis is maintained by the active movement of molecules across membranes.	LO2.12
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK2.C.1: Organisms use feedback mechanisms to maintain their internal environments and respond to external environmental changes.	Justify a claim made about the effect(s) on a biological system at the molecular, physiological or organismal level when given a scenario in which one or more components within a negative regulatory system is altered.	LO2.15
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK2.C.1: Organisms use feedback mechanisms to maintain their internal environments and respond to external environmental changes.	Connect how organisms use negative feedback to maintain their internal environments.	LO2.16
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK2.C.1: Organisms use feedback mechanisms to maintain their internal environments and respond to external environmental changes.	Evaluate data that show the effect(s) of changes in concentrations of key molecules on negative feedback mechanisms.	LO2.17

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK2.C.1: Organisms use feedback mechanisms to maintain their internal environments and respond to external environmental changes.	Make predictions about how organisms use negative feedback mechanisms to maintain their internal environments.	LO2.18
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK2.C.1: Organisms use feedback mechanisms to maintain their internal environments and respond to external environmental changes.	Make predictions about how positive feedback mechanisms amplify activities and processes in organisms based on scientific theories and models.	LO2.19
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK2.C.1: Organisms use feedback mechanisms to maintain their internal environments and respond to external environmental changes.	Justify that positive feedback mechanisms amplify responses in organisms.	LO2.20
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK2.C.2: Organisms respond to changes in their external environments.	Justify the selection of the kind of data needed to answer scientific questions about the relevant mechanism that organisms use to respond to changes in their external environment.	LO2.21
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK2.D.2: Homeostatic mechanisms reflect both common ancestry and divergence due to adaptation in different environments.	Construct explanations based on scientific evidence that homeostatic mechanisms reflect continuity due to common ancestry and/or divergence due to adaptation in different environments.	LO2.25
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK2.D.2: Homeostatic mechanisms reflect both common ancestry and divergence due to adaptation in different environments.	Analyze data to identify phylogenetic patterns or relationships, showing that homeostatic mechanisms reflect both continuity due to common ancestry and change due to evolution in different environments.	LO2.26
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK2.D.2: Homeostatic mechanisms reflect both common ancestry and divergence due to adaptation in different environments.	Connect differences in the environment with the evolution of homeostatic mechanisms.	LO2.27
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK2.D.3: Biological systems are affected by disruptions to their dynamic homeostasis.	Use representations or models to analyze quantitatively and qualitatively the effects of disruptions to dynamic homeostasis in biological systems.	LO2.28
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK2.D.4: Plants and animals have a variety of chemical defenses against infections that affect dynamic homeostasis.	Create representations and models to describe immune responses.	LO2.29
Science	HS	AP Bio	Unit 5 - Cell Communication and Body Systems	EK2.D.4: Plants and animals have a variety of chemical defenses against infections that affect dynamic homeostasis.	Create representations or models to describe nonspecific immune defenses in plants and animals.	LO2.30

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	AP Bio	Unit 6 - Cell Reproduction and Genetics	EK3.A.2: In eukaryotes, heritable information is passed to the next generation via processes that include the cell cycle and mitosis or meiosis plus fertilization.	Describe the events that occur in the cell cycle.	LO3.8
Science	HS	AP Bio	Unit 6 - Cell Reproduction and Genetics	EK3.A.2: In eukaryotes, heritable information is passed to the next generation via processes that include the cell cycle and mitosis or meiosis plus fertilization.	Make predictions about natural phenomena occurring during the cell cycle.	LO3.7
Science	HS	AP Bio	Unit 6 - Cell Reproduction and Genetics	EK3.A.2: In eukaryotes, heritable information is passed to the next generation via processes that include the cell cycle and mitosis or meiosis plus fertilization.	Describe the events that occur in the cell cycle.	LO3.8
Science	HS	AP Bio	Unit 6 - Cell Reproduction and Genetics	EK3.A.2: In eukaryotes, heritable information is passed to the next generation via processes that include the cell cycle and mitosis or meiosis plus fertilization.	Construct an explanation, using visual representations or narratives, as to how DNA in chromosomes is transmitted to the next generation via mitosis, or meiosis followed by fertilization.	LO3.9
Science	HS	AP Bio	Unit 6 - Cell Reproduction and Genetics	EK3.A.1: DNA, and in some cases RNA, is the primary source of heritable information.	Construct scientific explanations that use the structures and mechanisms of DNA and RNA to support the claim that DNA and, in some cases, that RNA are the primary sources of heritable information.	LO3.1
Science	HS	AP Bio	Unit 6 - Cell Reproduction and Genetics	EK3.A.1: DNA, and in some cases RNA, is the primary source of heritable information.	Justify the selection of data from historical investigations that support the claim that DNA is the source of heritable information.	LO3.2
Science	HS	AP Bio	Unit 6 - Cell Reproduction and Genetics	EK3.A.1: DNA, and in some cases RNA, is the primary source of heritable information.	Describe representations and models that illustrate how genetic information is copied for transmission between generations.	LO3.3
Science	HS	AP Bio	Unit 6 - Cell Reproduction and Genetics	EK3.A.3: The chromosomal basis of inheritance provides an understanding of the pattern of passage (transmission) of genes from parent to offspring.	Apply mathematical routines to determine Mendelian patterns of inheritance provided by data sets.	LO3.14
Science	HS	AP Bio	Unit 6 - Cell Reproduction and Genetics	EK3.A.4: The inheritance pattern of many traits cannot be explained by simple Mendelian genetics.	Explain deviations from Mendel's model of the inheritance of traits.	LO3.15
Science	HS	AP Bio	Unit 6 - Cell Reproduction and Genetics	EK3.A.4: The inheritance pattern of many traits cannot be explained by simple Mendelian genetics.	Explain how the inheritance patterns of many traits cannot be accounted for by Mendelian genetics.	LO3.16
Science	HS	AP Bio	Unit 6 - Cell Reproduction and Genetics	EK3.A.4: The inheritance pattern of many traits cannot be explained by simple Mendelian genetics.	Describe representations of an appropriate example of inheritance patterns that cannot be explained by Mendel's model of the inheritance of traits.	LO3.17

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK3.A.1: DNA, and in some cases RNA, is the primary source of heritable information.	Describe representations and models illustrating how genetic information is translated into polypeptides.	LO3.4
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK4.A.3: Interactions between external stimuli and regulated gene expression result in specialization of cells, tissues and organs.	Refine representations to illustrate how interactions between external stimuli and gene expression result in specialization of cells, tissues and organs.	LO4.7
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK4.A.4: Organisms exhibit complex properties due to interactions between their constituent parts.	Evaluate scientific questions concerning organisms that exhibit complex properties due to the interaction of their constituent parts.	LO4.8
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK4.A.4: Organisms exhibit complex properties due to interactions between their constituent parts.	Predict the effects of a change in a component (s) of a biological system on the functionality of an organism(s).	LO4.9
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK4.A.4: Organisms exhibit complex properties due to interactions between their constituent parts.	Refine representations and models to illustrate biocomplexity due to interactions of the constituent parts.	LO4.10
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK4.C.2: Environmental factors influence the expression of the genotype in an organism.	Construct explanations of the influence of environmental factors on the phenotype of an organism.	LO4.23
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK4.C.2: Environmental factors influence the expression of the genotype in an organism.	Predict the effects of a change in an environmental factor on the genotypic expression of the phenotype.	LO4.24
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK3.B.1: Gene regulation results in differential gene expression, leading to cell specialization.	Describe the connection between the regulation of gene expression and observed differences between different kinds of organisms.	LO3.18
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK3.B.1: Gene regulation results in differential gene expression, leading to cell specialization.	Describe the connection between the regulation of gene expression and observed differences between individuals in a population.	LO3.19
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK3.B.1: Gene regulation results in differential gene expression, leading to cell specialization.	Explain how the regulation of gene expression is essential for the processes and structures that support efficient cell function.	LO3.20
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK3.B.1: Gene regulation results in differential gene expression, leading to cell specialization.	Use representations to describe how gene regulation influences cell products and function.	LO3.21
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK3.B.2: A variety of intercellular and intracellular signal transmissions mediate gene expression.	Explain how signal pathways mediate gene expression, including how this process can affect protein production.	LO3.22

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK3.B.2: A variety of intercellular and intracellular signal transmissions mediate gene expression.	Use representations to describe mechanisms of the regulation of gene expression.	LO3.23
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK2.E.1: Timing and coordination of specific events are necessary for the normal development of an organism, and these events are regulated by a variety of mechanisms.	Use a graph or diagram to analyze situations or solve problems (quantitatively or qualitatively) that involve timing and coordination of events necessary for normal development in an organism.	LO2.32
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK2.E.1: Timing and coordination of specific events are necessary for the normal development of an organism, and these events are regulated by a variety of mechanisms.	Justify scientific claims with scientific evidence to show that timing and coordination of several events are necessary for normal development in an organism and that these events are regulated by multiple mechanisms.	LO2.33
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK2.E.1: Timing and coordination of specific events are necessary for the normal development of an organism, and these events are regulated by a variety of mechanisms.	Describe the role of programmed cell death in development and differentiation, the reuse of molecules, and the maintenance of dynamic homeostasis.	LO2.34
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK2.E.2: Timing and coordination of physiological events are regulated by multiple mechanisms.	Design a plan for collecting data to support the scientific claim that the timing and coordination of physiological events involve regulation.	LO2.35
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK2.E.2: Timing and coordination of physiological events are regulated by multiple mechanisms.	Justify scientific claims with evidence to show how timing and coordination of physiological events involve regulation.	LO2.36
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK2.E.2: Timing and coordination of physiological events are regulated by multiple mechanisms.	Connect concepts that describe mechanisms that regulate the timing and coordination of physiological events.	LO2.37
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK3.A.1: DNA, and in some cases RNA, is the primary source of heritable information.	Justify the claim that humans can manipulate heritable information by identifying at least two commonly used technologies.	LO3.5
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK2.E.1: Timing and coordination of specific events are necessary for the normal development of an organism, and these events are regulated by a variety of mechanisms.	Connect concepts in and across domains to show that timing and coordination of specific events are necessary for normal development in an organism and that these events are regulated by multiple mechanisms.	LO2.31
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK3.A.3: The chromosomal basis of inheritance provides an understanding of the pattern of passage (transmission) of genes from parent to offspring.	Pose questions about ethical, social or medical issues surrounding human genetic disorders.	LO3.13

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK3.A.1: DNA, and in some cases RNA, is the primary source of heritable information.	Predict how a change in a specific DNA or RNA sequence can result in changes in gene expression.	LO3.6
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK3.C.1: Changes in genotype can result in changes in phenotype.	Predict how a change in genotype, when expressed as a phenotype, provides a variation that can be subject to natural selection.	LO3.24
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK3.C.1: Changes in genotype can result in changes in phenotype.	Create a visual representation to illustrate how changes in a DNA nucleotide sequence can result in a change in the polypeptide produced.	LO3.25
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK3.A.2: In eukaryotes, heritable information is passed to the next generation via processes that include the cell cycle and mitosis or meiosis plus fertilization.	Evaluate evidence provided by data sets to support the claim that heritable information is passed from one generation to another generation through mitosis, or meiosis followed by fertilization.	LO3.11
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK3.A.3: The chromosomal basis of inheritance provides an understanding of the pattern of passage (transmission) of genes from parent to offspring.	Construct a representation that connects the process of meiosis to the passage of traits from parent to offspring.	LO3.12
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK3.A.2: In eukaryotes, heritable information is passed to the next generation via processes that include the cell cycle and mitosis or meiosis plus fertilization.	Construct an explanation, using visual representations or narratives, as to how DNA in chromosomes is transmitted to the next generation via mitosis, or meiosis followed by fertilization.	LO3.9
Science	HS	AP Bio	Unit 7 - Molecular Genetics and Gene Technology	EK3.A.2: In eukaryotes, heritable information is passed to the next generation via processes that include the cell cycle and mitosis or meiosis plus fertilization.	Represent the connection between meiosis and increased genetic diversity necessary for evolution.	LO3.10
Science	HS	AP Bio	Unit 8 - Evolution	EK3.C.1: Changes in genotype can result in changes in phenotype.	Explain the connection between genetic variations in organisms and phenotypic variations in populations.	LO3.26
Science	HS	AP Bio	Unit 8 - Evolution	EK3.C.2: Biological systems have multiple processes that increase genetic variation.	Compare and contrast processes by which genetic variation is produced and maintained in organisms from multiple domains.	LO3.27
Science	HS	AP Bio	Unit 8 - Evolution	EK3.C.2: Biological systems have multiple processes that increase genetic variation.	Construct an explanation of the multiple processes that increase variation within a population.	LO3.28
Science	HS	AP Bio	Unit 8 - Evolution	EK3.C.3: Viral replication results in genetic variation, and viral infection can introduce genetic variation into the hosts.	Construct an explanation of how viruses introduce genetic variation in host organisms.	LO3.29
Science	HS	AP Bio	Unit 8 - Evolution	EK3.C.3: Viral replication results in genetic variation, and viral infection can introduce genetic variation into the hosts.	Use representations and appropriate models to describe how viral replication introduces genetic variation in the viral population.	LO3.30

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	AP Bio	Unit 8 - Evolution	EK4.C.3: The level of variation in a population affects population dynamics.	Use evidence to justify a claim that a variety of phenotypic responses to a single environmental factor can result from different genotypes within the population.	LO4.25
Science	HS	AP Bio	Unit 8 - Evolution	EK4.C.3: The level of variation in a population affects population dynamics.	Use theories and models to make scientific claims and/ or predictions about the effects of variation within populations on survival and fitness.	LO4.26
Science	HS	AP Bio	Unit 8 - Evolution	EK3.A.2: In eukaryotes, heritable information is passed to the next generation via processes that include the cell cycle and mitosis or meiosis plus fertilization.	Represent the connection between meiosis and increased genetic diversity necessary for evolution.	LO3.10
Science	HS	AP Bio	Unit 8 - Evolution	EK1.A.1: Natural selection is a major mechanism of evolution.	Convert a data set from a table of numbers that reflect a change in the genetic makeup of a population over time and to apply mathematical methods and conceptual understandings to investigate the cause(s) and effect(s) of this change.	LO1.1
Science	HS	AP Bio	Unit 8 - Evolution	EK1.A.1: Natural selection is a major mechanism of evolution.	Evaluate evidence provided by data to qualitatively and quantitatively investigate the role of natural selection in evolution.	LO1.2
Science	HS	AP Bio	Unit 8 - Evolution	EK1.A.1: Natural selection is a major mechanism of evolution.	Apply mathematical methods to data from a real or simulated population to predict what will happen to the population in the future.	LO1.3
Science	HS	AP Bio	Unit 8 - Evolution	EK1.A.2: Natural selection acts on phenotypic variations in populations.	Evaluate data-based evidence that describes evolutionary changes in the genetic makeup of a population over time.	LO1.4
Science	HS	AP Bio	Unit 8 - Evolution	EK1.A.2: Natural selection acts on phenotypic variations in populations.	Connect evolutionary changes in a population over time to a change in the environment.	LO1.5
Science	HS	AP Bio	Unit 8 - Evolution	EK1.A.3: Evolutionary change is also driven by random processes.	Use data from mathematical models based on the Hardy- Weinberg equilibrium to analyze genetic drift and effects of selection in the evolution of specific populations.	LO1.6
Science	HS	AP Bio	Unit 8 - Evolution	EK1.A.3: Evolutionary change is also driven by random processes.	Justify data from mathematical models based on the Hardy-Weinberg equilibrium to analyze genetic drift and the effects of selection in the evolution of specific populations.	LO1.7
Science	HS	AP Bio	Unit 8 - Evolution	EK1.A.3: Evolutionary change is also driven by random processes.	Make predictions about the effects of genetic drift, migration and artificial selection on the genetic makeup of a population.	LO1.8
Science	HS	AP Bio	Unit 8 - Evolution	EK1.A.4: Biological evolution is supported by scientific evidence from many disciplines, including mathematics.	Evaluate evidence provided by data from many scientific disciplines that support biological evolution.	LO1.9

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	AP Bio	Unit 8 - Evolution	EK1.A.4: Biological evolution is supported by scientific evidence from many disciplines, including mathematics.	Refine evidence based on data from many scientific disciplines that support biological evolution.	LO1.10
Science	HS	AP Bio	Unit 8 - Evolution	EK1.A.4: Biological evolution is supported by scientific evidence from many disciplines, including mathematics.	Design a plan to answer scientific questions regarding how organisms have changed over time using information from morphology, biochemistry and geology.	LO1.11
Science	HS	AP Bio	Unit 8 - Evolution	EK1.A.4: Biological evolution is supported by scientific evidence from many disciplines, including mathematics.	Connect scientific evidence from many scientific disciplines to support the modern concept of evolution.	LO1.12
Science	HS	AP Bio	Unit 8 - Evolution	EK1.A.4: Biological evolution is supported by scientific evidence from many disciplines, including mathematics.	Construct and/or justify mathematical models, diagrams or simulations that represent processes of biological evolution.	LO1.13
Science	HS	AP Bio	Unit 8 - Evolution	EK1.B.1: Organisms share many conserved core processes and features that evolved and are widely distributed among organisms today.	Pose scientific questions that correctly identify essential properties of shared, core life processes that provide insights into the history of life on Earth.	LO1.14
Science	HS	AP Bio	Unit 9 - Ecology	EK3.E.1: Individuals can act on information and communicate it to others.	Describe how organisms exchange information in response to internal changes or environmental cues.	LO3.42
Science	HS	AP Bio	Unit 9 - Ecology	EK2.E.3: Timing and coordination of behavior are regulated by various mechanisms and are important in natural selection.	Analyze data to support the claim that responses to information and communication of information affect natural selection.	LO2.38
Science	HS	AP Bio	Unit 9 - Ecology	EK2.E.3: Timing and coordination of behavior are regulated by various mechanisms and are important in natural selection.	Justify scientific claims, using evidence, to describe how timing and coordination of behavioral events in organisms are regulated by several mechanisms.	LO2.39
Science	HS	AP Bio	Unit 9 - Ecology	EK2.E.3: Timing and coordination of behavior are regulated by various mechanisms and are important in natural selection.	Connect concepts in and across domain(s) to predict how environmental factors affect responses to information and change behavior.	LO2.40
Science	HS	AP Bio	Unit 9 - Ecology	EK3.E.1: Individuals can act on information and communicate it to others.	Analyze data that indicate how organisms exchange information in response to internal changes and external cues, and which can change behavior.	LO3.40
Science	HS	AP Bio	Unit 9 - Ecology	EK3.E.1: Individuals can act on information and communicate it to others.	Create a representation that describes how organisms exchange information in response to internal changes and external cues, and which can result in changes in behavior.	LO3.41

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	AP Bio	Unit 9 - Ecology	EK4.A.5: Communities are composed of populations of organisms that interact in complex ways.	Justify the selection of the kind of data needed to answer scientific questions about the interaction of populations within communities.	LO4.11
Science	HS	AP Bio	Unit 9 - Ecology	EK4.A.5: Communities are composed of populations of organisms that interact in complex ways.	Apply mathematical routines to quantities that describe communities composed of populations of organisms that interact in complex ways.	LO4.12
Science	HS	AP Bio	Unit 9 - Ecology	EK4.A.5: Communities are composed of populations of organisms that interact in complex ways.	Predict the effects of a change in the community's populations on the community.	LO4.13
Science	HS	AP Bio	Unit 9 - Ecology	EK4.B.3: Interactions between and within populations influence patterns of species distribution and abundance.	Use data analysis to refine observations and measurements regarding the effect of population interactions on patterns of species distribution and abundance.	LO4.19
Science	HS	AP Bio	Unit 9 - Ecology	EK2.D.1: All biological systems from cells and organisms to populations, communities and ecosystems are affected by complex biotic and abiotic interactions involving exchange of matter and free energy.	Refine scientific models and questions about the effect of complex biotic and abiotic interactions on all biological systems, from cells and organisms to populations, communities and ecosystems.	LO2.22
Science	HS	AP Bio	Unit 9 - Ecology	EK2.D.1: All biological systems from cells and organisms to populations, communities and ecosystems are affected by complex biotic and abiotic interactions involving exchange of matter and free energy.	Design a plan for collecting data to show that all biological systems (cells, organisms, populations, communities and ecosystems) are affected by complex biotic and abiotic interactions.	LO2.23
Science	HS	AP Bio	Unit 9 - Ecology	EK2.D.1: All biological systems from cells and organisms to populations, communities and ecosystems are affected by complex biotic and abiotic interactions involving exchange of matter and free energy.	Analyze data to identify possible patterns and relationships between a biotic or abiotic factor and a biological system (cells, organisms, populations, communities or ecosystems).	LO2.24
Science	HS	AP Bio	Unit 9 - Ecology	EK2.A.3: Organisms must exchange matter with the environment to grow, reproduce and maintain organization.	Justify the selection of data regarding the types of molecules that an animal, plant or bacterium will take up as necessary building blocks and excrete as waste products.	LO2.8
Science	HS	AP Bio	Unit 9 - Ecology	EK2.A.3: Organisms must exchange matter with the environment to grow, reproduce and maintain organization.	Represent graphically or model quantitatively the exchange of molecules between an organism and its environment, and the subsequent use of these molecules to build new molecules that facilitate dynamic homeostasis, growth and reproduction.	LO2.9

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	AP Bio	Unit 9 - Ecology	EK2.A.1: All living systems require constant input of free energy.	Justify a scientific claim that free energy is required for living systems to maintain organization, to grow or to reproduce, but that multiple strategies exist in different living systems.	LO2.2
Science	HS	AP Bio	Unit 9 - Ecology	EK2.A.1: All living systems require constant input of free energy.	Predict how changes in free energy availability affect organisms, populations and ecosystems.	LO2.3
Science	HS	AP Bio	Unit 9 - Ecology	EK4.A.6: Interactions among living systems and with their environment result in the movement of matter and energy.	Apply mathematical routines to quantities that describe interactions among living systems and their environment, which result in the movement of matter and energy.	LO4.14
Science	HS	AP Bio	Unit 9 - Ecology	EK4.A.6: Interactions among living systems and with their environment result in the movement of matter and energy.	Use visual representations to analyze situations or solve problems qualitatively to illustrate how interactions among living systems and with their environment result in the movement of matter and energy.	LO4.15
Science	HS	AP Bio	Unit 9 - Ecology	EK4.A.6: Interactions among living systems and with their environment result in the movement of matter and energy.	Predict the effects of a change of matter or energy availability on communities.	LO4.16
Science	HS	AP Bio	Unit 9 - Ecology	EK2.D.3: Biological systems are affected by disruptions to their dynamic homeostasis.	Use representations or models to analyze quantitatively and qualitatively the effects of disruptions to dynamic homeostasis in biological systems.	LO2.28
Science	HS	AP Bio	Unit 9 - Ecology	EK4.B.3: Interactions between and within populations influence patterns of species distribution and abundance.	Explain how the distribution of ecosystems changes over time by identifying large-scale events that have resulted in these changes in the past.	LO4.20
Science	HS	AP Bio	Unit 9 - Ecology	EK4.B.3: Interactions between and within populations influence patterns of species distribution and abundance.	Predict consequences of human actions on both local and global ecosystems.	LO4.21
Science	HS	AP Bio	Unit 9 - Ecology	EK4.C.4: The diversity of species within an ecosystem may influence the stability of the ecosystem.	Make scientific claims and predictions about how species diversity within an ecosystem influences ecosystem stability.	LO4.27
Science	HS	Biology	Unit 1: Basic Principles of Biology	Explain the characteristics common to all organisms.	Describe the characteristics of life shared by all prokaryotic and eukaryotic organisms.	BIO.A.1.1.1
Science	HS	Biology	Unit 1: Basic Principles of Biology	Describe relationships between structure and function at biological levels of organization.	Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).	BIO.A.1.2.2
Science	HS	Biology	Unit 2: The Chemical Basis of Life	Explain how enzymes regulate biochemical reactions within a cell.	Describe the role of an enzyme as a catalyst in regulating a specific biochemical reaction	BIO.A.2.3.1

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Biology	Unit 2: The Chemical Basis of Life	Explain how enzymes regulate biochemical reactions within a cell.	Explain how factors such as pH, temperature, and concentration levels can affect enzyme function	BIO.A.2.3.2
Science	HS	Biology	Unit 2: The Chemical Basis of Life	Describe and interpret relationships between structure and function at various levels of biochemical organization (i.e., atoms, molecules, and macromolecules).	Explain how carbon is uniquely suited to form biological macromolecules.	BIO.A.2.2.1
Science	HS	Biology	Unit 2: The Chemical Basis of Life	Describe and interpret relationships between structure and function at various levels of biochemical organization (i.e., atoms, molecules, and macromolecules).	Describe how biological macromolecules form from monomers.	BIO.A.2.2.2
Science	HS	Biology	Unit 2: The Chemical Basis of Life	Describe and interpret relationships between structure and function at various levels of biochemical organization (i.e., atoms, molecules, and macromolecules).	Compare and contrast the structure and function of carbohydrates, lipids, proteins, and nucleic acids in organisms.	BIO.A.2.2.3
Science	HS	Biology	Unit 3: Bioenergetics	Identify and describe the cell structures involved in processing energy.	Describe the fundamental roles of plastids (e. g., chloroplasts) and mitochondria in energy transformations.	BIO.A.3.1.1
Science	HS	Biology	Unit 3: Bioenergetics	Identify and describe how energy is captured and transformed in organisms to drive their life processes.	Compare and contrast the basic transformation of energy during photosynthesis and cellular respiration.	BIO.A.3.2.1
Science	HS	Biology	Unit 3: Bioenergetics	Identify and describe how organisms obtain and transform energy for their life processes.	Describe the role of ATP in biochemical reactions.	BIO.A.3.2.2
Science	HS	Biology	Unit 3: Bioenergetics	Explain how enzymes regulate biochemical reactions within a cell.	Describe the role of an enzyme as a catalyst in regulating a specific biochemical reaction.	BIO.A.2.3.1
Science	HS	Biology	Unit 3: Bioenergetics	Explain how enzymes regulate biochemical reactions within a cell.	Explain how factors such as pH, temperature, and concentration levels can affect enzyme function.	BIO.A.2.3.2
Science	HS	Biology	Unit 4: Homeostasis & Cell Transport	Identify and describe the cell structures involved in transport of materials into, out of, and throughout a cell.	Describe how endoplasmic reticulum, Golgi apparatus, and other membrane-bound cellular organelles facilitate transport of materials within cells.	BIO.A.4.1.3
Science	HS	Biology	Unit 4: Homeostasis & Cell Transport	Explain mechanisms that permit organisms to maintain biological balance between their internal and external environments.	Explain how organisms maintain homeostasis (e.g., thermoregulation, water regulation, oxygen regulation).	BIO.A.4.2.1

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Biology	Unit 4: Homeostasis & Cell Transport	Identify and describe the cell structures involved in transport of materials into, out of, and throughout a cell.	Describe how the structure of the plasma membrane allows it to function as a regulatory structure and/or protective barrier for a cell.	BIO.A.4.1.1
Science	HS	Biology	Unit 4: Homeostasis & Cell Transport	Identify and describe the cell structures involved in transport of materials into, out of, and throughout a cell.	Compare and contrast the mechanisms that transport materials across the plasma membrane (i.e., passive transport -- diffusion, osmosis, facilitated diffusion; active transport -- pumps, endocytosis, exocytosis).	BIO.A.4.1.2
Science	HS	Biology	Unit 4: Homeostasis & Cell Transport	Describe how the unique properties of water support life on Earth.	Describe the unique properties of water and how these properties support life on Earth (e. g., freezing point, high specific heat, cohesion).	BIO.A.2.1.1
Science	HS	Biology	Unit 5: Cell Growth and Reproduction	Describe the three stages of the cell cycle: interphase, nuclear division, cytokinesis.	Describe the events that occur during the cell cycle: interphase, nuclear division (i.e., mitosis or meiosis), cytokinesis.	BIO.B.1.1.1
Science	HS	Biology	Unit 5: Cell Growth and Reproduction	Describe the three stages of the cell cycle: interphase, nuclear division, cytokinesis.	Compare and contrast the processes and outcomes of mitotic and meiotic nuclear divisions.	BIO.B.1.1.2
Science	HS	Biology	Unit 5: Cell Growth and Reproduction	Explain how genetic information is inherited.	Describe how the process of DNA replication results in the transmission and/or conservation of genetic information.	BIO.B.1.2.1
Science	HS	Biology	Unit 6: Genetics	Explain how genetic information is inherited.	Describe how the process of DNA replication results in the transmission and/or conservation of genetic information.	BIO.B.1.2.1
Science	HS	Biology	Unit 6: Genetics	Explain how genetic information is inherited.	Explain the functional relationships among DNA, genes, alleles, and chromosomes and their roles in inheritance.	BIO.B.1.2.2
Science	HS	Biology	Unit 6: Genetics	Compare Mendelian and non-Mendelian patterns of inheritance.	Describe and/or predict observed patterns of inheritance (i.e., dominant, recessive, co-dominance, incomplete dominance, sex-linked, polygenic, and multiple alleles).	BIO.B.2.1.1
Science	HS	Biology	Unit 6: Genetics	Compare Mendelian and non-Mendelian patterns of inheritance.	Describe processes that can alter composition or number of chromosomes (i.e., crossing-over, nondisjunction, duplication, translocation, deletion, insertion, and inversion).	BIO.B.2.1.2
Science	HS	Biology	Unit 6: Genetics	Explain the process of protein synthesis (i.e., transcription, translation, and protein modification).	Describe how the processes of transcription and translation are similar in all organisms.	BIO.B.2.2.1
Science	HS	Biology	Unit 6: Genetics	Explain the process of protein synthesis (i.e., transcription, translation, and protein modification).	Describe the role of ribosomes, endoplasmic reticulum, Golgi apparatus, and the nucleus in the production of specific types of proteins.	BIO.B.2.2.2
Science	HS	Biology	Unit 6: Genetics	Explain how genetic information is expressed.	Describe how genetic mutations alter the DNA sequence and may or may not affect phenotype (e.g., silent, nonsense, frame-shift).	BIO.B.2.3.1

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Biology	Unit 6: Genetics	Apply scientific thinking, processes, tools, and technologies in the study of genetics.	Explain how genetic engineering has impacted the fields of medicine, forensics, and agriculture (e.g., selective breeding, gene splicing, cloning, genetically modified organisms, gene therapy).	BIO.B.2.4.1
Science	HS	Biology	Unit 6: Genetics	Apply scientific thinking, processes, tools, and technologies in the study of the theory of evolution.	Distinguish between the scientific terms: hypothesis, inference, law, theory, principle, fact, and observation.	BIO.B.3.3.1
Science	HS	Biology	Unit 6: Genetics	Identify and describe the cell structures involved in transport of materials into, out of, and throughout a cell.	Describe how endoplasmic reticulum, Golgi apparatus, and other membrane-bound cellular organelles facilitate transport of materials within cells.	BIO.A.4.1.3
Science	HS	Biology	Unit 7: Evolution	Explain the mechanisms of evolution.	Explain how natural selection can impact allele frequencies of a population.	BIO.B.3.1.1
Science	HS	Biology	Unit 7: Evolution	Explain the mechanisms of evolution.	Describe the factors that can contribute to the development of new species (e.g., isolating mechanisms, genetic drift, founder effect, migration).	BIO.B.3.1.2
Science	HS	Biology	Unit 7: Evolution	Explain the mechanisms of evolution.	Explain how genetic mutations may result in genotypic and phenotypic variations within a population.	BIO.B.3.1.3
Science	HS	Biology	Unit 7: Evolution	Analyze the sources of evidence for biological evolution.	Interpret evidence supporting the theory of evolution (i.e., fossil, anatomical, physiological, embryological, biochemical, and universal genetic code).	BIO.B.3.2.1
Science	HS	Biology	Unit 7: Evolution	Apply scientific thinking, processes, tools, and technologies in the study of the theory of evolution.	Distinguish between the scientific terms: hypothesis, inference, law, theory, principle, fact, and observation.	BIO.B.3.3.1
Science	HS	Biology	Unit 7: Evolution	Describe interactions and relationships in an ecosystem.	Describe the effects of limiting factors on population dynamics and potential species extinction.	BIO.B.4.2.5
Science	HS	Biology	Unit 8: Ecology	Describe ecological levels of organization in the biosphere.	Describe the levels of ecological organization (i.e., organism, population, community, ecosystem, biome, biosphere).	BIO.B.4.1.1
Science	HS	Biology	Unit 8: Ecology	Describe ecological levels of organization in the biosphere.	Describe characteristic biotic and abiotic components of aquatic and terrestrial ecosystems.	BIO.B.4.1.2
Science	HS	Biology	Unit 8: Ecology	Describe interactions and relationships in an ecosystem.	Describe how energy flows through an ecosystem (e.g., food chains, food webs, energy pyramids)	BIO.B.4.2.1
Science	HS	Biology	Unit 8: Ecology	Describe interactions and relationships in an ecosystem.	Describe biotic interactions in an ecosystem (e.g., competition, predation, symbiosis).	BIO.B.4.2.2

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Biology	Unit 8: Ecology	Describe interactions and relationships in an ecosystem.	Describe how matter recycles through an ecosystem (i.e., water cycle, carbon cycle, oxygen cycle, and nitrogen cycle).	BIO.B.4.2.3
Science	HS	Biology	Unit 8: Ecology	Describe interactions and relationships in an ecosystem.	Describe how ecosystems change in response to natural and human disturbances (e.g., climate changes, introduction of nonnative species, pollution, fires).	BIO.B.4.2.4
Science	HS	Biology	Unit 8: Ecology	Describe interactions and relationships in an ecosystem.	Describe the effects of limiting factors on population dynamics and potential species extinction.	BIO.B.4.2.5
Science	HS	Honors Biology	Unit 1: Basic Principles of Biology	Explain the characteristics common to all organisms.	Describe the characteristics of life shared by all prokaryotic and eukaryotic organisms.	BIO.A.1.1.1
Science	HS	Honors Biology	Unit 1: Basic Principles of Biology	Describe relationships between structure and function at biological levels of organization.	Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).	BIO.A.1.2.2
Science	HS	Honors Biology	Unit 2: The Chemical Basis of Life	Explain how enzymes regulate biochemical reactions within a cell.	Describe the role of an enzyme as a catalyst in regulating a specific biochemical reaction	BIO.A.2.3.1
Science	HS	Honors Biology	Unit 2: The Chemical Basis of Life	Explain how enzymes regulate biochemical reactions within a cell.	Explain how factors such as pH, temperature, and concentration levels can affect enzyme function	BIO.A.2.3.2
Science	HS	Honors Biology	Unit 2: The Chemical Basis of Life	Describe and interpret relationships between structure and function at various levels of biochemical organization (i.e., atoms, molecules, and macromolecules).	Explain how carbon is uniquely suited to form biological macromolecules.	BIO.A.2.2.1
Science	HS	Honors Biology	Unit 2: The Chemical Basis of Life	Describe and interpret relationships between structure and function at various levels of biochemical organization (i.e., atoms, molecules, and macromolecules).	Describe how biological macromolecules form from monomers.	BIO.A.2.2.2
Science	HS	Honors Biology	Unit 2: The Chemical Basis of Life	Describe and interpret relationships between structure and function at various levels of biochemical organization (i.e., atoms, molecules, and macromolecules).	Compare and contrast the structure and function of carbohydrates, lipids, proteins, and nucleic acids in organisms.	BIO.A.2.2.3
Science	HS	Honors Biology	Unit 3: Bioenergetics	Identify and describe the cell structures involved in processing energy.	Describe the fundamental roles of plastids (e. g., chloroplasts) and mitochondria in energy transformations.	BIO.A.3.1.1
Science	HS	Honors Biology	Unit 3: Bioenergetics	Identify and describe how energy is captured and transformed in organisms to drive their life processes.	Compare and contrast the basic transformation of energy during photosynthesis and cellular respiration.	BIO.A.3.2.1

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Biology	Unit 3: Bioenergetics	Identify and describe how organisms obtain and transform energy for their life processes.	Describe the role of ATP in biochemical reactions.	BIO.A.3.2.2
Science	HS	Honors Biology	Unit 3: Bioenergetics	Explain how enzymes regulate biochemical reactions within a cell.	Describe the role of an enzyme as a catalyst in regulating a specific biochemical reaction.	BIO.A.2.3.1
Science	HS	Honors Biology	Unit 3: Bioenergetics	Explain how enzymes regulate biochemical reactions within a cell.	Explain how factors such as pH, temperature, and concentration levels can affect enzyme function.	BIO.A.2.3.2
Science	HS	Honors Biology	Unit 4: Homeostasis & Cell Transport	Identify and describe the cell structures involved in transport of materials into, out of, and throughout a cell.	Describe how endoplasmic reticulum, Golgi apparatus, and other membrane-bound cellular organelles facilitate transport of materials within cells.	BIO.A.4.1.3
Science	HS	Honors Biology	Unit 4: Homeostasis & Cell Transport	Explain mechanisms that permit organisms to maintain biological balance between their internal and external environments.	Explain how organisms maintain homeostasis (e.g., thermoregulation, water regulation, oxygen regulation).	BIO.A.4.2.1
Science	HS	Honors Biology	Unit 4: Homeostasis & Cell Transport	Identify and describe the cell structures involved in transport of materials into, out of, and throughout a cell.	Describe how the structure of the plasma membrane allows it to function as a regulatory structure and/or protective barrier for a cell.	BIO.A.4.1.1
Science	HS	Honors Biology	Unit 4: Homeostasis & Cell Transport	Identify and describe the cell structures involved in transport of materials into, out of, and throughout a cell.	Compare and contrast the mechanisms that transport materials across the plasma membrane (i.e., passive transport -- diffusion, osmosis, facilitated diffusion; active transport -- pumps, endocytosis, exocytosis).	BIO.A.4.1.2
Science	HS	Honors Biology	Unit 4: Homeostasis & Cell Transport	Describe how the unique properties of water support life on Earth.	Describe the unique properties of water and how these properties support life on Earth (e. g., freezing point, high specific heat, cohesion).	BIO.A.2.1.1
Science	HS	Honors Biology	Unit 5: Cell Growth and Reproduction	Describe the three stages of the cell cycle: interphase, nuclear division, cytokinesis.	Describe the events that occur during the cell cycle: interphase, nuclear division (i.e., mitosis or meiosis), cytokinesis.	BIO.B.1.1.1
Science	HS	Honors Biology	Unit 5: Cell Growth and Reproduction	Describe the three stages of the cell cycle: interphase, nuclear division, cytokinesis.	Compare and contrast the processes and outcomes of mitotic and meiotic nuclear divisions.	BIO.B.1.1.2
Science	HS	Honors Biology	Unit 5: Cell Growth and Reproduction	Explain how genetic information is inherited.	Describe how the process of DNA replication results in the transmission and/or conservation of genetic information.	BIO.B.1.2.1
Science	HS	Honors Biology	Unit 6: Genetics	Explain how genetic information is inherited.	Describe how the process of DNA replication results in the transmission and/or conservation of genetic information.	BIO.B.1.2.1
Science	HS	Honors Biology	Unit 6: Genetics	Explain how genetic information is inherited.	Explain the functional relationships among DNA, genes, alleles, and chromosomes and their roles in inheritance.	BIO.B.1.2.2

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Biology	Unit 6: Genetics	Compare Mendelian and non-Mendelian patterns of inheritance.	Describe and/or predict observed patterns of inheritance (i.e., dominant, recessive, co-dominance, incomplete dominance, sex-linked, polygenic, and multiple alleles).	BIO.B.2.1.1
Science	HS	Honors Biology	Unit 6: Genetics	Compare Mendelian and non-Mendelian patterns of inheritance.	Describe processes that can alter composition or number of chromosomes (i.e., crossing-over, nondisjunction, duplication, translocation, deletion, insertion, and inversion).	BIO.B.2.1.2
Science	HS	Honors Biology	Unit 6: Genetics	Explain the process of protein synthesis (i.e., transcription, translation, and protein modification).	Describe how the processes of transcription and translation are similar in all organisms.	BIO.B.2.2.1
Science	HS	Honors Biology	Unit 6: Genetics	Explain the process of protein synthesis (i.e., transcription, translation, and protein modification).	Describe the role of ribosomes, endoplasmic reticulum, Golgi apparatus, and the nucleus in the production of specific types of proteins.	BIO.B.2.2.2
Science	HS	Honors Biology	Unit 6: Genetics	Explain how genetic information is expressed.	Describe how genetic mutations alter the DNA sequence and may or may not affect phenotype (e.g., silent, nonsense, frame-shift).	BIO.B.2.3.1
Science	HS	Honors Biology	Unit 6: Genetics	Apply scientific thinking, processes, tools, and technologies in the study of genetics.	Explain how genetic engineering has impacted the fields of medicine, forensics, and agriculture (e.g., selective breeding, gene splicing, cloning, genetically modified organisms, gene therapy).	BIO.B.2.4.1
Science	HS	Honors Biology	Unit 6: Genetics	Apply scientific thinking, processes, tools, and technologies in the study of the theory of evolution.	Distinguish between the scientific terms: hypothesis, inference, law, theory, principle, fact, and observation.	BIO.B.3.3.1
Science	HS	Honors Biology	Unit 6: Genetics	Identify and describe the cell structures involved in transport of materials into, out of, and throughout a cell.	Describe how endoplasmic reticulum, Golgi apparatus, and other membrane-bound cellular organelles facilitate transport of materials within cells.	BIO.A.4.1.3
Science	HS	Honors Biology	Unit 7: Evolution	Explain the mechanisms of evolutio	Explain how natural selection can impact allele frequencies of a population.	BIO.B.3.1.1
Science	HS	Honors Biology	Unit 7: Evolution	Explain the mechanisms of evolutio	Describe the factors that can contribute to the development of new species (e.g., isolating mechanisms, genetic drift, founder effect, migration).	BIO.B.3.1.2
Science	HS	Honors Biology	Unit 7: Evolution	Explain the mechanisms of evolutio	Explain how genetic mutations may result in genotypic and phenotypic variations within a population.	BIO.B.3.1.3
Science	HS	Honors Biology	Unit 7: Evolution	Analyze the sources of evidence for biological evolution.	Interpret evidence supporting the theory of evolution (i.e., fossil, anatomical, physiological, embryological, biochemical, and universal genetic code).	BIO.B.3.2.1

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Biology	Unit 7: Evolution	Apply scientific thinking, processes, tools, and technologies in the study of the theory of evolution.	Distinguish between the scientific terms: hypothesis, inference, law, theory, principle, fact, and observation.	BIO.B.3.3.1
Science	HS	Honors Biology	Unit 7: Evolution	Describe interactions and relationships in an ecosystem.	Describe the effects of limiting factors on population dynamics and potential species extinction.	BIO.B.4.2.5
Science	HS	Honors Biology	Unit 8: Ecology	Describe ecological levels of organization in the biosphere.	Describe the levels of ecological organization (i.e., organism, population, community, ecosystem, biome, biosphere).	BIO.B.4.1.1
Science	HS	Honors Biology	Unit 8: Ecology	Describe ecological levels of organization in the biosphere.	Describe characteristic biotic and abiotic components of aquatic and terrestrial ecosystems.	BIO.B.4.1.2
Science	HS	Honors Biology	Unit 8: Ecology	Describe interactions and relationships in an ecosystem.	Describe how energy flows through an ecosystem (e.g., food chains, food webs, energy pyramids)	BIO.B.4.2.1
Science	HS	Honors Biology	Unit 8: Ecology	Describe interactions and relationships in an ecosystem.	Describe biotic interactions in an ecosystem (e.g., competition, predation, symbiosis).	BIO.B.4.2.2
Science	HS	Honors Biology	Unit 8: Ecology	Describe interactions and relationships in an ecosystem.	Describe how matter recycles through an ecosystem (i.e., water cycle, carbon cycle, oxygen cycle, and nitrogen cycle).	BIO.B.4.2.3
Science	HS	Honors Biology	Unit 8: Ecology	Describe interactions and relationships in an ecosystem.	Describe how ecosystems change in response to natural and human disturbances (e.g., climate changes, introduction of nonnative species, pollution, fires).	BIO.B.4.2.4
Science	HS	Honors Biology	Unit 8: Ecology	Describe interactions and relationships in an ecosystem.	Describe the effects of limiting factors on population dynamics and potential species extinction.	BIO.B.4.2.5
Science	HS	Honors Physics 2	Unit 1: SHM and Waves	Waves and their Applications in Technologies for Information Transfer	Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.	MS-PS4-1
Science	HS	Honors Physics 2	Unit 1: SHM and Waves	Waves and their Applications in Technologies for Information Transfer	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	MS-PS4-2
Science	HS	Honors Physics 2	Unit 1: SHM and Waves	Waves and their Applications in Technologies for Information Transfer	Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.	HS-PS4-1
Science	HS	Honors Physics 2	Unit 1: SHM and Waves	Oscillations	Define terms and units associated with simple harmonic motion.	3.4.12.C.12
Science	HS	Honors Physics 2	Unit 1: SHM and Waves	Oscillations	Apply concepts of simple harmonic motion to solve problems.	3.4.12.C.13
Science	HS	Honors Physics 2	Unit 1: SHM and Waves	Vibrations and Waves	Define terms and units associated with waves and vibrations.	3.4.12.C.01

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Physics 2	Unit 1: SHM and Waves	Vibrations and Waves	Apply the conceptual properties of waves to solve problems.	3.4.12.C.02
Science	HS	Honors Physics 2	Unit 2: Sound-A	Waves and their Applications in Technologies for Information Transfer	Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.	MS-PS4-1
Science	HS	Honors Physics 2	Unit 2: Sound-A	Waves and their Applications in Technologies for Information Transfer	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	MS-PS4-2
Science	HS	Honors Physics 2	Unit 2: Sound-A	Waves and their Applications in Technologies for Information Transfer	Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.	HS-PS4-1
Science	HS	Honors Physics 2	Unit 2: Sound-A	Sound	Define terms and units associated with sound.	3.4.12.C.03
Science	HS	Honors Physics 2	Unit 2: Sound-A	Sound	Apply concepts involving air columns and strings to solve problems.	3.4.12.C.04
Science	HS	Honors Physics 2	Unit 2: Sound-A	Sound	Apply concepts involving the Doppler effect, sonic booms, and shock waves to solve problems	3.4.12.C.05
Science	HS	Honors Physics 2	Unit 3: Sound-B	Waves and their Applications in Technologies for Information Transfer	Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.	MS-PS4-1
Science	HS	Honors Physics 2	Unit 3: Sound-B	Waves and their Applications in Technologies for Information Transfer	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	MS-PS4-2
Science	HS	Honors Physics 2	Unit 3: Sound-B	Waves and their Applications in Technologies for Information Transfer	Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.	HS-PS4-1
Science	HS	Honors Physics 2	Unit 3: Sound-B	Sound	Define terms and units associated with sound.	3.4.12.C.03
Science	HS	Honors Physics 2	Unit 3: Sound-B	Sound	Apply concepts involving air columns and strings to solve problems.	3.4.12.C.04
Science	HS	Honors Physics 2	Unit 3: Sound-B	Sound	Apply concepts involving the Doppler effect, sonic booms, and shock waves to solve problems	3.4.12.C.05
Science	HS	Honors Physics 2	Unit 4: EM Waves and the Nature of Light	Motion and Stability: Forces and Interactions	Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.	HS-PS2-5
Science	HS	Honors Physics 2	Unit 4: EM Waves and the Nature of Light	Waves and their Applications in Technologies for Information Transfer	Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.	HS-PS4-1

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Physics 2	Unit 4: EM Waves and the Nature of Light	Light/Waves	Define terms and units associated with the wave nature of light.	3.4.12.C.12
Science	HS	Honors Physics 2	Unit 4: EM Waves and the Nature of Light	Light/Optics	Understand the historical development of the properties of light.	3.4.12.C.07
Science	HS	Honors Physics 2	Unit 4: EM Waves and the Nature of Light	Electrostatics	Define terms and units associated with electrostatics.	CYSCPH2.4.01
Science	HS	Honors Physics 2	Unit 4: EM Waves and the Nature of Light	Electrostatics	Solve problems involving Coulomb's Law.	CYSCPH2.4.02
Science	HS	Honors Physics 2	Unit 4: EM Waves and the Nature of Light	Electrostatics	Apply the concept of electric fields to solve problems.	CYSCPH2.4.03
Science	HS	Honors Physics 2	Unit 4: EM Waves and the Nature of Light	Magnetism	Define terms and units associated with magnetism.	CYSCPH2.4.04
Science	HS	Honors Physics 2	Unit 4: EM Waves and the Nature of Light	Electromagnetism	Define terms and units associated with electromagnetism.	CYSCPH2.4.05
Science	HS	Honors Physics 2	Unit 4: EM Waves and the Nature of Light	Electromagnetism	Apply the concept of magnetic field to solve problems.	CYSCPH2.4.06
Science	HS	Honors Physics 2	Unit 4: EM Waves and the Nature of Light	Electromagnetism	Analyze the forces on moving charges in magnetic fields.	CYSCPH2.4.07
Science	HS	Honors Physics 2	Unit 4: EM Waves and the Nature of Light	Electromagnetism	Apply the concept of induced EMF to solve problems.	CYSCPH2.4.08
Science	HS	Honors Physics 2	Unit 4: EM Waves and the Nature of Light	Electromagnetism	Apply Lenz's and Faraday's law to solve problems.	CYSCPH2.4.09
Science	HS	Honors Physics 2	Unit 5: Geometric Optics-A	Waves and their Applications in Technologies for Information Transfer	Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.	HS-PS4-1
Science	HS	Honors Physics 2	Unit 5: Geometric Optics-A	Waves and their Applications in Technologies for Information Transfer	Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.	HS-PS4-4
Science	HS	Honors Physics 2	Unit 5: Geometric Optics-A	Light/Optics	Define terms and units associated with geometrical optics.	3.4.12.C.06
Science	HS	Honors Physics 2	Unit 5: Geometric Optics-A	Light/Optics	Understand the historical development of the properties of light.	3.4.12.C.07
Science	HS	Honors Physics 2	Unit 5: Geometric Optics-A	Light/Optics	Apply concepts of geometrical optics to solve problems involving mirrors.	3.2.12.B.33
Science	HS	Honors Physics 2	Unit 5: Geometric Optics-A	Light/Optics	Apply concepts of geometrical optics to solve problems involving refraction.	3.2.12.B.04
Science	HS	Honors Physics 2	Unit 5: Geometric Optics-A	Light/Optics	Solve systems of geometrical optics using ray diagramming.	3.4.12.C.10
Science	HS	Honors Physics 2	Unit 5: Geometric Optics-A	Light/Optics	Solve systems of geometrical optics using the thin lens equipment.	3.4.12.C.11

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Physics 2	Unit 6: Geometric Optics-B	Waves and their Applications in Technologies for Information Transfer	Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.	HS-PS4-1
Science	HS	Honors Physics 2	Unit 6: Geometric Optics-B	Waves and their Applications in Technologies for Information Transfer	Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.	HS-PS4-4
Science	HS	Honors Physics 2	Unit 6: Geometric Optics-B	Light/Optics	Define terms and units associated with geometrical optics.	3.4.12.C.06
Science	HS	Honors Physics 2	Unit 6: Geometric Optics-B	Light/Optics	Understand the historical development of the properties of light.	3.4.12.C.07
Science	HS	Honors Physics 2	Unit 6: Geometric Optics-B	Light/Optics	Apply concepts of geometrical optics to solve problems involving mirrors.	3.2.12.B.33
Science	HS	Honors Physics 2	Unit 6: Geometric Optics-B	Light/Optics	Apply concepts of geometrical optics to solve problems involving refraction.	3.2.12.B.04
Science	HS	Honors Physics 2	Unit 6: Geometric Optics-B	Light/Optics	Solve systems of geometrical optics using ray diagramming.	3.4.12.C.10
Science	HS	Honors Physics 2	Unit 6: Geometric Optics-B	Light/Optics	Solve systems of geometrical optics using the thin lens equipment.	3.4.12.C.11
Science	HS	Honors Physics 2	Unit 7: Waves Optics-A	Waves and their Applications in Technologies for Information Transfer	Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.	HS-PS4-1
Science	HS	Honors Physics 2	Unit 7: Waves Optics-A	Waves and their Applications in Technologies for Information Transfer	Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.	HS-PS4-3
Science	HS	Honors Physics 2	Unit 7: Waves Optics-A	Waves and their Applications in Technologies for Information Transfer	Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.	HS-PS4-4
Science	HS	Honors Physics 2	Unit 7: Waves Optics-A	Light/Waves	Define terms and units associated with the wave nature of light.	3.4.12.C.12
Science	HS	Honors Physics 2	Unit 7: Waves Optics-A	Light/Waves	Apply concepts of wave nature of light to interference by slits.	3.4.12.C.13
Science	HS	Honors Physics 2	Unit 7: Waves Optics-A	Light/Waves	Apply concepts of the wave nature of light to interference by thin films.	3.4.12.C.14
Science	HS	Honors Physics 2	Unit 7: Waves Optics-A	Light/Waves	Apply concepts of polarization to solve problems.	3.4.12.C.15
Science	HS	Honors Physics 2	Unit 8: Waves Optics-B	Waves and their Applications in Technologies for Information Transfer	Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.	HS-PS4-1

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Physics 2	Unit 8: Waves Optics-B	Waves and their Applications in Technologies for Information Transfer	Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.	HS-PS4-3
Science	HS	Honors Physics 2	Unit 8: Waves Optics-B	Waves and their Applications in Technologies for Information Transfer	Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.	HS-PS4-4
Science	HS	Honors Physics 2	Unit 8: Waves Optics-B	Light/Waves	Define terms and units associated with the wave nature of light.	3.4.12.C.12
Science	HS	Honors Physics 2	Unit 8: Waves Optics-B	Light/Waves	Apply concepts of wave nature of light to interference by slits.	3.4.12.C.13
Science	HS	Honors Physics 2	Unit 8: Waves Optics-B	Light/Waves	Apply concepts of the wave nature of light to interference by thin films.	3.4.12.C.14
Science	HS	Honors Physics 2	Unit 8: Waves Optics-B	Light/Waves	Apply concepts of polarization to solve problems.	3.4.12.C.15
Science	HS	Honors Physics 2	Unit 9: Quantum and Atomic Physics	Atomic and Nuclear	Define terms and units associated with atomic and nuclear physics.	3.4.12.A.04
Science	HS	Honors Physics 2	Unit 9: Quantum and Atomic Physics	Atomic and Nuclear	Understand the historical development of atomic and nuclear physics.	3.4.12.A.05
Science	HS	Honors Physics 2	Unit 10: Nuclear Physics	Matter and its Interactions	Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.	HS-PS1-8
Science	HS	Honors Physics 2	Unit 10: Nuclear Physics	Atomic and Nuclear	Study basic nuclear decays and reactions.	3.4.12.A.03
Science	HS	Honors Physics 2	Unit 10: Nuclear Physics	Atomic and Nuclear	Define terms and units associated with atomic and nuclear physics.	3.4.12.A.04
Science	HS	Honors Physics 2	Unit 10: Nuclear Physics	Atomic and Nuclear	Understand the historical deve	3.4.12.A.05
				Atomic and Nuclear	Apply the concept of nuclear reactions to solve problems.	4.12.A.07
Science	HS	Honors Physics 2	Unit 10: Nuclear Physics	Atomic and Nuclear	Apply concepts of nuclear physics to solve problems involving radioactive decay.lopment of atomic and nuclear physics.	3.4.12.A.08
Science	HS	Honors Physics 2	Unit 11: Quantum Physics	Waves and their Applications in Technologies for Information Transfer	Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.	HS-PS4-3
Science	HS	Honors Physics 2	Unit 11: Quantum Physics	Quantum	Study experiments that are fundamental to quantum theory.	3.4.12.A.01
Science	HS	Honors Physics 3	Unit 11: Quantum Physics	Quantum	Study the basic terms of quantum theory.	3.4.12.A.02
Science	HS	Honors Physics 4	Unit 11: Quantum Physics	Atomic and Nuclear	Apply the concepts of photons and the photoelectric effect to solve problems.	3.4.12.A.06

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Chemistry	Mole/Stoich	HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	Apply the mole concept to representative particles (e.g., counting, determining mass of atoms, ions, molecules, and/or formula units).	CHEM.B.1.1.1
Science	HS	Chemistry	Mole/Stoich	HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	Relate the percent composition and mass of each element present in a compound.	CHEM.B.1.2.3
Science	HS	Chemistry	Mole/Stoich	HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	Use stoichiometric relationships to calculate the amounts of reactants and products involved in a chemical reaction	CHEM.B.2.1.2
Science	HS	Chemistry	Mole/Stoich	HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	Describe the roles of limiting and excess reactants in chemical reactions.	CHEM.B.2.1.1
Science	HS	Chemistry	Atomic Structure	HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Describe the evolution of atomic theory leading to the current model of the atom based on the works of Dalton, Thomson, Rutherford, and Bohr.	CHEM.A.2.1.1
Science	HS	Chemistry	Atomic Structure	HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Predict the ground state electronic configuration and/or orbital diagram for a given atom or ion.	CHEM.A.2.2.1
Science	HS	Chemistry	Atomic Structure	HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Relate the existence of quantized energy levels to atomic emission spectra.	CHEM.A.2.2.4
Science	HS	Chemistry	Chemical Interactions: Covalent	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Apply a systematic set of rules (IUPAC) for naming compounds and writing chemical formulas (e.g., binary covalent, binary ionic, ionic compounds containing polyatomic ions).	CHEM.A.1.1.5
Science	HS	Chemistry	Chemical Interactions: Covalent	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Describe how chemical bonding can affect whether a substance dissolves in a given liquid.	CHEM.A.1.2.5

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Chemistry	Chemical Interactions: Covalent	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Classify a bond as being polar covalent, nonpolar covalent, or ionic.	CHEM.B.1.3.2
Science	HS	Chemistry	Chemical Interactions: Covalent	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Use illustrations to predict the polarity of a molecule.	CHEM.B.1.3.3
Science	HS	Chemistry	Chemical Interactions: Covalent	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	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).	CHEM.B.1.4.1
Science	HS	Chemistry	Chemical Interactions: Covalent	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Utilize Lewis dot structures to predict the structure and bonding in simple compounds.	CHEM.B.1.4.2
Science	HS	Chemistry	Chemical Interactions: Covalent	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Classify and explain forces between molecules as hydrogen bonding.	CHEM.B.1.4.2.a
Science	HS	Chemistry	Chemical Interactions: Ionic	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Apply a systematic set of rules (IUPAC) for naming compounds and writing chemical formulas (e.g., binary covalent, binary ionic, ionic compounds containing polyatomic ions).	CHEM.A.1.1.5
Science	HS	Chemistry	Chemical Interactions: Ionic	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Classify a bond as being polar covalent, nonpolar covalent, or ionic.	CHEM.B.1.3.2

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Chemistry	Chemical Interactions: Ionic	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	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).	CHEM.B.1.4.1
Science	HS	Chemistry	Chemical Reactions	HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	Classify reactions as synthesis, decomposition, single replacement, double replacement, or combustion.	CHEM.B.2.1.3
Science	HS	Chemistry	Chemical Reactions	HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	Predict products of simple chemical reactions (e.g., synthesis, decomposition, single replacement, double replacement, combustion).	CHEM.B.2.1.4
Science	HS	Chemistry	Chemical Reactions	HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	Balance chemical equations by applying the Law of Conservation of Matter.	CHEM.B.2.1.5
Science	HS	Chemistry	Matter	HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Apply the law of definite proportions to the classification of elements and compounds as pure substances.	CHEM.B.1.2.2
Science	HS	Chemistry	Matter	HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Relate the percent composition and mass of each element present in a compound.	CHEM.B.1.2.3
Science	HS	Chemistry	Matter	HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Classify physical or chemical changes within a system in terms of matter and/or energy.	CHEM.A.1.1.1
Science	HS	Chemistry	Matter	HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Convert measurement distance, mass, capacity, time, or temperature within the same system (metric or standard).	CHEM.A.1.1.1.a
Science	HS	Chemistry	Matter	HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Apply appropriate techniques, tools, and formulas to determine measurements.	CHEM.A.1.1.1.b

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Chemistry	Matter	HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Determine the appropriate types of measurement (perimeter, circumference, area, surface area, and/or volume) for a given situation.	CHEM.A.1.1.1.c
Science	HS	Chemistry	Periodic Table	HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Predict the ground state electronic configuration and/or orbital diagram for a given atom or ion.	CHEM.A.2.2.1
Science	HS	Chemistry	Periodic Table	HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	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 bonds, reactivity).	CHEM.A.2.2.1.a
Science	HS	Chemistry	Solutions and Acid/Base	HS-PS1-3. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Describe how chemical bonding can affect whether a substance dissolves in a given liquid.	CHEM.A.1.2.5
Science	HS	Chemistry	Solutions and Acid/Base	HS-PS1-3. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Describe how factors (e.g., temperature, concentration, surface area) can affect solubility.	CHEM.A.1.2.3
Science	HS	Chemistry	Solutions and Acid/Base	HS-PS1-3. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Describe various ways that concentration can be expressed and calculated (e.g., molarity, percent by mass, percent by volume).	CHEM.A.1.2.4
Science	HS	Chemistry	Solutions and Acid/Base	HS-PS1-3. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Apply the mole concept to representative particles (e.g., counting, determining mass of atoms, ions, molecules, and/or formula units).	CHEM.B.1.1.1
Science	HS	Chemistry	Solutions and Acid/Base	HS-PS1-3. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Describe the properties of acids and bases.	CHEM.B.1.1.1.a

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Chemistry	Solutions and Acid/Base	HS-PS1-3. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Describe the pH scale and its use in determining the strength of acids and bases.	CHEM.B.1.1.1.b
Science	HS	Chemistry	Solutions and Acid/Base	HS-PS1-3. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Describe the outcome of neutralization reactions.	CHEM.B.1.1.1.c
Science	HS	Honors Chemistry	Atomic Structure	Matter and its Interactions	Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	HS-PS1-1
Science	HS	Honors Chemistry	Atomic Structure	HS-PS1-1 Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.	HS-PS4-3
Science	HS	Honors Chemistry	Atomic Structure	HS-PS1-1 Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.	HS-PS4-4
Science	HS	Honors Chemistry	Atomic Structure	HS-PS1-1 Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Describe the evolution of atomic theory leading to the current model of the atom based on the works of Dalton, Thomson, Rutherford, and Bohr.	CHEM.A.2.1.1
Science	HS	Honors Chemistry	Atomic Structure	HS-PS1-1 Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Predict the ground state electronic configuration and/or orbital diagram for a given atom or ion.	CHEM.A.2.2.1
Science	HS	Honors Chemistry	Atomic Structure	HS-PS1-1 Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Relate the existence of quantized energy levels to atomic emission spectra.	CHEM.A.2.2.4
Science	HS	Honors Chemistry	Chemical Interactions Covalent	Matter and its Interactions	Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	HS-PS1-3

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Chemistry	Chemical Interactions Covalent	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Apply a systematic set of rules (IUPAC) for naming compounds and writing chemical formulas (e.g., binary covalent, binary ionic, ionic compounds containing polyatomic ions).	CHEM.A.1.1.5
Science	HS	Honors Chemistry	Chemical Interactions Covalent	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Describe how chemical bonding can affect whether a substance dissolves in a given liquid.	CHEM.A.1.2.5
Science	HS	Honors Chemistry	Chemical Interactions Covalent	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Classify a bond as being polar covalent, nonpolar covalent, or ionic.	CHEM.B.1.3.2
Science	HS	Honors Chemistry	Chemical Interactions Covalent	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Use illustrations to predict the polarity of a molecule.	CHEM.B.1.3.3
Science	HS	Honors Chemistry	Chemical Interactions Covalent	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	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).	CHEM.B.1.4.1
Science	HS	Honors Chemistry	Chemical Interactions Covalent	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Utilize Lewis dot structures to predict the structure and bonding in simple compounds.	CHEM.B.1.4.2
Science	HS	Honors Chemistry	Chemical Interactions Covalent	Matter and its Interactions	Classify and explain forces between molecules as dispersion, dipole-dipole or hydrogen bonding.	HS-PS1-3.A
Science	HS	Honors Chemistry	Chemical Interactions Ionic	Matter and its Interactions	Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	HS-PS1-3

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Chemistry	Chemical Interactions Ionic	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Apply a systematic set of rules (IUPAC) for naming compounds and writing chemical formulas (e.g., binary covalent, binary ionic, ionic compounds containing polyatomic ions).	CHEM.A.1.1.5
Science	HS	Honors Chemistry	Chemical Interactions Ionic	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Classify a bond as being polar covalent, nonpolar covalent, or ionic.	CHEM.B.1.3.2
Science	HS	Honors Chemistry	Chemical Interactions Ionic	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	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).	CHEM.B.1.4.1
Science	HS	Honors Chemistry	Chemical Reactions	Matter and its Interactions	Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	HS-PS1-7
Science	HS	Honors Chemistry	Chemical Reactions	HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	Classify reactions as synthesis, decomposition, single replacement, double replacement, or combustion.	CHEM.B.2.1.3
Science	HS	Honors Chemistry	Chemical Reactions	HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	Predict products of simple chemical reactions (e.g., synthesis, decomposition, single replacement, double replacement, combustion).	CHEM.B.2.1.4
Science	HS	Honors Chemistry	Chemical Reactions	HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	Balance chemical equations by applying the Law of Conservation of Matter.	CHEM.B.2.1.5
Science	HS	Honors Chemistry	Matter	Matter and its Interactions	Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	HS-PS1-1
Science	HS	Honors Chemistry	Matter	HS-PS1-1 Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Classify physical or chemical changes within a system in terms of matter and/or energy.	CHEM.A.1.1.1

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Chemistry	Matter	HS-PS1-1 Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Apply the law of definite proportions to the classification of elements and compounds as pure substances.	CHEM.B.1.2.2
Science	HS	Honors Chemistry	Matter	HS-PS1-1 Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Relate the percent composition and mass of each element present in a compound.	CHEM.B.1.2.3
Science	HS	Honors Chemistry	Matter	HS-PS1-1 Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Convert measurement distance, mass, capacity, time, or temperature within the same system (metric or standard).	HS-PS1-1.A
Science	HS	Honors Chemistry	Matter	HS-PS1-1 Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Apply appropriate techniques, tools, and formulas to determine measurements.	HS-PS1-1.B
Science	HS	Honors Chemistry	Matter	HS-PS1-1 Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Determine the appropriate types of measurement (perimeter, circumference, area, surface area, and/or volume) for a given situation.	HS-PS1-1.C
Science	HS	Honors Chemistry	Mole, Percent Comp and Empirical, Molecular Formulas	Matter and its Interactions	Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	HS-PS1-7
Science	HS	Honors Chemistry	Mole, Percent Comp and Empirical, Molecular Formulas	HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	Apply the mole concept to representative particles (e.g., counting, determining mass of atoms, ions, molecules, and/or formula units).	CHEM.B.1.1.1
Science	HS	Honors Chemistry	Mole, Percent Comp and Empirical, Molecular Formulas	HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	Determine the empirical and molecular formulas of compounds.	CHEM.B.1.2.1
Science	HS	Honors Chemistry	Mole, Percent Comp and Empirical, Molecular Formulas	HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	Relate the percent composition and mass of each element present in a compound.	CHEM.B.1.2.3
Science	HS	Honors Chemistry	Periodic Table	Matter and its Interactions	Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	HS-PS1-1

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Chemistry	Periodic Table	HS-PS1-1 Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	Predict the ground state electronic configuration and/or orbital diagram for a given atom or ion.	CHEM.A.2.2.1
Science	HS	Honors Chemistry	Periodic Table	HS-PS1-1 Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	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 bonds, reactivity).	HS-PS1-1.A
Science	HS	Honors Chemistry	Solutions and Acid/Base	Matter and its Interactions	Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	HS-PS1-3
Science	HS	Honors Chemistry	Solutions and Acid/Base	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Describe how chemical bonding can affect whether a substance dissolves in a given liquid.	CHEM.A.1.2.5
Science	HS	Honors Chemistry	Solutions and Acid/Base	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Describe how factors (e.g., temperature, concentration, surface area) can affect solubility.	CHEM.A.1.2.3
Science	HS	Honors Chemistry	Solutions and Acid/Base	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Describe various ways that concentration can be expressed and calculated (e.g., molarity, percent by mass, percent by volume).	CHEM.A.1.2.4
Science	HS	Honors Chemistry	Solutions and Acid/Base	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Apply the mole concept to representative particles (e.g., counting, determining mass of atoms, ions, molecules, and/or formula units).	CHEM.B.1.1.1
Science	HS	Honors Chemistry	Solutions and Acid/Base	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Describe the properties of acids and bases.	HS-PS1-3.A

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Chemistry	Solutions and Acid/Base	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Describe the pH scale and its use in determining the strength of acids and bases.	HS-PS1-3.B
Science	HS	Honors Chemistry	Solutions and Acid/Base	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Describe the outcome of neutralization reactions.	HS-PS1-3.C
Science	HS	Honors Chemistry	Stoichiometry	Matter and its Interactions	Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	HS-PS1-7
Science	HS	Honors Chemistry	Stoichiometry	HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	Describe the roles of limiting and excess reactants in chemical reactions.	CHEM.B.2.1.1
Science	HS	Honors Chemistry	Stoichiometry	HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	Use stoichiometric relationships to calculate the amounts of reactants and products involved in a chemical reaction.	CHEM.B.2.1.2
Science	HS	Earth Science	Unit 1 - Fundamentals of Science	3.3.A: Earth Structure, Processes and Cycles	Identify questions that can be answered through scientific investigations and evaluate the appropriateness of questions.	3.3.7.A7.b
Science	HS	Earth Science	Unit 1 - Fundamentals of Science	3.3.A: Earth Structure, Processes and Cycles	Design and conduct a scientific investigation and understand that current scientific knowledge guides scientific investigations.	3.3.7.A7.c
Science	HS	Earth Science	Unit 1 - Fundamentals of Science	3.3.A: Earth Structure, Processes and Cycles	Describe relationships using inference and prediction.	3.3.7.A7.d
Science	HS	Earth Science	Unit 1 - Fundamentals of Science	3.3.A: Earth Structure, Processes and Cycles	Use appropriate tools and technologies to gather, analyze, and interpret data and understand that it enhances accuracy and allows scientists to analyze and quantify results of investigations.	3.3.7.A7.e
Science	HS	Earth Science	Unit 1 - Fundamentals of Science	3.3.A: Earth Structure, Processes and Cycles	Use mathematics in all aspects of scientific inquiry.	3.3.7.A7.h
Science	HS	Earth Science	Unit 1 - Fundamentals of Science	MST1: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions	Understand that science uses both qualitative and quantitative observations as a means to study the natural world.	MST1.a

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Earth Science	Unit 1 - Fundamentals of Science	MST1: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions	Use process skills to make inferences and predictions using collected information by means of a lab report	MST1.b
Science	HS	Earth Science	Unit 1 - Fundamentals of Science	MST1: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions	Use process skills to collect, organize, and show metric measurements (Metric-Metric)	MST1.c
Science	HS	Earth Science	Unit 1 - Fundamentals of Science	MST1: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions	Use deductive and inductive reasoning to reach mathematical conclusions including area, volume, rate of change, percent error, density, and graph analysis	MST1.d
Science	HS	Earth Science	Unit 1 - Fundamentals of Science	MST1: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions	Develop appropriate scientific experiments by raising questions, formulating hypotheses, testing, controlled experiments, recognizing variables, manipulating variables, interpreting data, and producing solutions	MST1.e
Science	HS	Earth Science	Unit 2 - Minerals & Rocks	HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	Explain the properties of materials in terms of the arrangement and properties of the atoms that compose them	HS-ESS2-3.a
Science	HS	Earth Science	Unit 2 - Minerals & Rocks	HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	Categorize/group objects using physical characteristics.	S4.C.1.1.2
Science	HS	Earth Science	Unit 2 - Minerals & Rocks	HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	Define basic features of the rock cycle.	3.3.7.A1
Science	HS	Earth Science	Unit 2 - Minerals & Rocks	HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	Identify the three basic rock types and describe their formation (i.e., igneous [granite, basalt, obsidian, and pumice]; sedimentary [limestone, sandstone, shale, and coal]; and metamorphic [slate, quartzite, marble, and gneiss]).	S6.D.1.1.2
Science	HS	Earth Science	Unit 2 - Minerals & Rocks	HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	Explain how matter on earth is conserved throughout the geological processes over time.	3.3.8.A3

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Earth Science	Unit 3 - Earth's Interior & Plate Tectonics	HS-ESS1-5. Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.	Properties of Earth's internal structure (crust, mantle, inner core, and outer core) can be inferred from the analysis of the behavior of seismic waves (including velocity and refraction).	HS-ESS1-5.a
Science	HS	Earth Science	Unit 3 - Earth's Interior & Plate Tectonics	HS-ESS1-5. Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.	Describe and indicate the motions that show the Earth is a dynamic, changing, geological system	HS-ESS1-5.b
Science	HS	Earth Science	Unit 3 - Earth's Interior & Plate Tectonics	HS-ESS1-5. Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.	Plate motions have resulted in global changes in geography, and the patterns of organic evolution.	HS-ESS1-5.c
Science	HS	Earth Science	Unit 3 - Earth's Interior & Plate Tectonics	HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	Describe the layers of the earth.	3.3.7.A1.a
Science	HS	Earth Science	Unit 3 - Earth's Interior & Plate Tectonics	HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	Differentiate among the mechanisms by which heat is transferred through the Earth's system.	3.3.7.A1.b
Science	HS	Earth Science	Unit 3 - Earth's Interior & Plate Tectonics	HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	Relate plate tectonics to both slow and rapid changes in the earth's surface	3.3.10.A1
Science	HS	Earth Science	Unit 4 - Earthquakes and Volcanoes	HS-ESS2-3 Earth's Systems	Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	HS-ESS2-3.
Science	HS	Earth Science	Unit 4 - Earthquakes and Volcanoes	HS-ESS1-5 Earth's Place in the Universe	Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.	HS-ESS1-5.
Science	HS	Earth Science	Unit 4 - Earthquakes and Volcanoes	3.3.A: Earth Structure, Processes and Cycles	Relate plate tectonics to both slow and rapid changes in the earth's surface	3.3.10.A1
Science	HS	Earth Science	Unit 4 - Earthquakes and Volcanoes	3.3.12.A1 Analyze the processes that cause the movement of material in the Earth's systems.	Evaluate the impact of geologic activities/hazards (e.g. earthquakes, volcanoes).	3.3.12.A1.a
Science	HS	Earth Science	Unit 4 - Earthquakes and Volcanoes	3.3.12.A1 Analyze the processes that cause the movement of material in the Earth's systems.	Interpret a seismogram generated by a seismic event (earthquake), in order to draw conclusion on the location of an epicenter, magnitude of a earthquake, and compare types of damage created by the seismic event.	3.3.12.A1.b
Science	HS	Earth Science	Unit 4 - Earthquakes and Volcanoes	3.3.12.A1 Analyze the processes that cause the movement of material in the Earth's systems.	Identify the pattern that exists between location of earthquakes and volcanoes with plate boundaries.	3.3.12.A1.c

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Earth Science	Unit 1 - Fundamentals of Science	3.3.A: Earth Structure, Processes and Cycles	Identify questions that can be answered through scientific investigations and evaluate the appropriateness of questions.	3.3.7.A7.b
Science	HS	Honors Earth Science	Unit 1 - Fundamentals of Science	3.3.A: Earth Structure, Processes and Cycles	Design and conduct a scientific investigation and understand that current scientific knowledge guides scientific investigations.	3.3.7.A7.c
Science	HS	Honors Earth Science	Unit 1 - Fundamentals of Science	3.3.A: Earth Structure, Processes and Cycles	Describe relationships using inference and prediction.	3.3.7.A7.d
Science	HS	Honors Earth Science	Unit 1 - Fundamentals of Science	3.3.A: Earth Structure, Processes and Cycles	Use appropriate tools and technologies to gather, analyze, and interpret data and understand that it enhances accuracy and allows scientists to analyze and quantify results of investigations.	3.3.7.A7.e
Science	HS	Honors Earth Science	Unit 1 - Fundamentals of Science	3.3.A: Earth Structure, Processes and Cycles	Use mathematics in all aspects of scientific inquiry.	3.3.7.A7.h
Science	HS	Honors Earth Science	Unit 1 - Fundamentals of Science	MST1: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions	Understand that science uses both qualitative and quantitative observations as a means to study the natural world.	MST1.a
Science	HS	Honors Earth Science	Unit 1 - Fundamentals of Science	MST1: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions	Use process skills to make inferences and predictions using collected information by means of a lab report	MST1.b
Science	HS	Honors Earth Science	Unit 1 - Fundamentals of Science	MST1: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions	Use process skills to collect, organize, and show metric measurements (Metric-Metric)	MST1.c
Science	HS	Honors Earth Science	Unit 1 - Fundamentals of Science	MST1: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions	Use deductive and inductive reasoning to reach mathematical conclusions including area, volume, rate of change, percent error, density, and graph analysis	MST1.d
Science	HS	Honors Earth Science	Unit 1 - Fundamentals of Science	MST1: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions	Develop appropriate scientific experiments by raising questions, formulating hypotheses, testing, controlled experiments, recognizing variables, manipulating variables, interpreting data, and producing solutions	MST1.e

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Earth Science	Unit 1 - Fundamentals of Science	MST1: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions	Understand and use dimensional analysis/factor label method for English-English or English-Metric Conversions	MST1.f
Science	HS	Honors Earth Science	Unit 1 - Fundamentals of Science	MST1: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions	Use Significant Figures when solving a mathematical calculation	MST1.g
Science	HS	Honors Earth Science	Unit 2 - Minerals & Rocks	HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	Explain the properties of materials in terms of the arrangement and properties of the atoms that compose them	HS-ESS2-3.a
Science	HS	Honors Earth Science	Unit 2 - Minerals & Rocks	HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	Categorize/group objects using physical characteristics.	S4.C.1.1.2
Science	HS	Honors Earth Science	Unit 2 - Minerals & Rocks	HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	Define basic features of the rock cycle.	3.3.7.A1
Science	HS	Honors Earth Science	Unit 2 - Minerals & Rocks	HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	Identify the three basic rock types and describe their formation (i.e., igneous [granite, basalt, obsidian, and pumice]; sedimentary [limestone, sandstone, shale, and coal]; and metamorphic [slate, quartzite, marble, and gneiss]).	S6.D.1.1.2
Science	HS	Honors Earth Science	Unit 2 - Minerals & Rocks	HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	Explain how matter on earth is conserved throughout the geological processes over time.	3.3.8.A3
Science	HS	Honors Earth Science	Unit 3 - Earth's Interior & Plate Tectonics	HS-ESS1-5. Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.	Properties of Earth's internal structure (crust, mantle, inner core, and outer core) can be inferred from the analysis of the behavior of seismic waves (including velocity and refraction).	HS-ESS1-5.a
Science	HS	Honors Earth Science	Unit 3 - Earth's Interior & Plate Tectonics	HS-ESS1-5. Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.	Describe and indicate the motions that show the Earth is a dynamic, changing, geological system	HS-ESS1-5.b

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Earth Science	Unit 3 - Earth's Interior & Plate Tectonics	HS-ESS1-5. Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.	Plate motions have resulted in global changes in geography, and the patterns of organic evolution.	HS-ESS1-5.c
Science	HS	Honors Earth Science	Unit 3 - Earth's Interior & Plate Tectonics	HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	Describe the layers of the earth.	3.3.7.A1.a
Science	HS	Honors Earth Science	Unit 3 - Earth's Interior & Plate Tectonics	HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	Differentiate among the mechanisms by which heat is transferred through the Earth's system.	3.3.7.A1.b
Science	HS	Honors Earth Science	Unit 3 - Earth's Interior & Plate Tectonics	HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	Relate plate tectonics to both slow and rapid changes in the earth's surface	3.3.10.A1
Science	HS	Honors Earth Science	Unit 4 - Earthquakes and Volcanoes	HS-ESS2-3 Earth's Systems	Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	HS-ESS2-3.
Science	HS	Honors Earth Science	Unit 4 - Earthquakes and Volcanoes	HS-ESS1-5 Earth's Place in the Universe	Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.	HS-ESS1-5.
Science	HS	Honors Earth Science	Unit 4 - Earthquakes and Volcanoes	3.3.A: Earth Structure, Processes and Cycles	Relate plate tectonics to both slow and rapid changes in the earth's surface	3.3.10.A1
Science	HS	Honors Earth Science	Unit 4 - Earthquakes and Volcanoes	3.3.12.A1 Analyze the processes that cause the movement of material in the Earth's systems.	Evaluate the impact of geologic activities/hazards (e.g. earthquakes, volcanoes).	3.3.12.A1.a
Science	HS	Honors Earth Science	Unit 4 - Earthquakes and Volcanoes	3.3.12.A1 Analyze the processes that cause the movement of material in the Earth's systems.	Interpret a seismogram generated by a seismic event (earthquake), in order to draw conclusion on the location of an epicenter, magnitude of a earthquake, and compare types of damage created by the seismic event.	3.3.12.A1.b
Science	HS	Honors Earth Science	Unit 4 - Earthquakes and Volcanoes	3.3.12.A1 Analyze the processes that cause the movement of material in the Earth's systems.	Identify the pattern that exists between location of earthquakes and volcanoes with plate boundaries.	3.3.12.A1.c
Science	HS	Earth Science II	Unit 1 - Astronomy	Earth's Place in the Universe	Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy that eventually reaches Earth in the form of radiation.	HS-ESS1-1.
Science	HS	Earth Science II	Unit 1 - Astronomy	Earth's Place in the Universe	Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe.	HS-ESS1-2.

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Earth Science II	Unit 1 - Astronomy	Earth's Place in the Universe	Communicate scientific ideas about the way stars, over their life cycle, produce elements.	HS-ESS1-3.
Science	HS	Earth Science II	Unit 1 - Astronomy	Earth Structure, Processes and Cycles	Describe the motions of tides and identify their causes.	3.3.7.A4
Science	HS	Earth Science II	Unit 1 - Astronomy	Origin and Evolution of the Universe	Explain how gravity is the major force in the formation of the planets, stars, and the solar system.	3.3.7.B1.a
Science	HS	Earth Science II	Unit 1 - Astronomy	Composition and Structure of the Universe	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, and time).	S7.D.3.1.1
Science	HS	Earth Science II	Unit 1 - Astronomy	Origin and Evolution of the Universe	Describe gravity as a major force in determining the motions of planets, stars, and the solar system.	3.3.7.B1.b
Science	HS	Earth Science II	Unit 1 - Astronomy	Origin and Evolution of the Universe	Compare and contrast properties and conditions of objects in the solar system to those on Earth.	3.3.7.B1.c
Science	HS	Earth Science II	Unit 1 - Astronomy	Origin and Evolution of the Universe	Describe the basic nuclear processes involved in energy production in a star.	3.3.10.B1
Science	HS	Earth Science II	Unit 1 - Astronomy	Origin and Evolution of the Universe	Explain how scientists obtain information about the universe by using technology to detect electromagnetic radiation that is emitted, reflected, or absorbed by stars and other objects.	3.3.10.B2.a
Science	HS	Earth Science II	Unit 1 - Astronomy	Origin and Evolution of the Universe	Describe changes in the universe over billions of years.	3.3.10.B2.b
Science	HS	Earth Science II	Unit 1 - Astronomy	Origin and Evolution of the Universe	Explain the scale used to measure the sizes of stars and galaxies and the distances between them	3.3.10.B2.c
Science	HS	Earth Science II	Unit 1 - Astronomy	Origin and Evolution of the Universe	Describe the life cycle of stars based on their mass.	3.3.12.B1.a
Science	HS	Earth Science II	Unit 1 - Astronomy	Origin and Evolution of the Universe	Analyze the influence of gravity on the formation and life cycles of galaxies, including our own Milky Way galaxy; stars; planetary systems; and residual material left from the creation of the solar system.	3.3.12.B1.b
Science	HS	Earth Science II	Unit 1 - Astronomy	Origin and Evolution of the Universe	Relate the nuclear processes involved in energy production in stars and supernovas to their life cycles.	3.3.12.B1.c
Science	HS	Earth Science II	Unit 2 - Oceanography	HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth’s systems result in changes in climate.	Differentiate among Earth’s water systems.	3.3.7.A4

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Earth Science II	Unit 2 - Oceanography	HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.	Distinguish between physical and chemical weathering.	3.3.8.A1
Science	HS	Earth Science II	Unit 2 - Oceanography	HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.	Explain how the oceans form one interconnected circulation system powered by wind, tides, the Earth's rotation, and water density differences.	3.3.8.A4
Science	HS	Earth Science II	Unit 2 - Oceanography	HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.	Explain how the oceans form one interconnected circulation system powered by wind, tides, the Earth's rotation, and water density differences.	3.3.8.A4
Science	HS	Earth Science II	Unit 2 - Oceanography	HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.	Explain the dynamics of oceanic currents and their relationship to global circulation within the marine environment.	3.3.10.A5
Science	HS	Earth Science II	Unit 2 - Oceanography	HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.	Explain how there is only one ocean.	3.3.10.A5
Science	HS	Earth Science II	Unit 3 - Meteorology	HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.	Describe basic elements of meteorology.	3.3.7.A5
Science	HS	Earth Science II	Unit 3 - Meteorology	HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.	Compare and contrast water vapor, clouds, and humidity.	3.3.8.A5
Science	HS	Earth Science II	Unit 3 - Meteorology	HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.	Interpret meteorological data to describe and/or predict weather.	3.3.10.A6
Science	HS	Earth Science II	Unit 3 - Meteorology	HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.	Explain how the unequal heating of the Earth's surface leads to atmospheric global circulation changes, climate, local short term changes, and weather.	3.3.12.A6

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Earth Science II	Unit 3 - Meteorology	HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.	Relate the transfer of energy through radiation, conduction, and convection to global atmospheric processes.	3.3.12.A6
Science	HS	Honors Organic Chemistry	Unit 1 Introduction to Organic Chemistry	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Classify a bond as being polar covalent, non-polar covalent, or ionic.	CHEM.B.1.3.2
Science	HS	Honors Organic Chemistry	Unit 1 Introduction to Organic Chemistry	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Use illustrations to predict the polarity of a molecule.	CHEM.B.1.3.3
Science	HS	Honors Organic Chemistry	Unit 1 Introduction to Organic Chemistry	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	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).	CHEM.B.1.4.1
Science	HS	Honors Organic Chemistry	Unit 1 Introduction to Organic Chemistry	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Utilize Lewis dot structures to predict the structure and bonding in simple compounds.	CHEM.B.1.4.2
Science	HS	Honors Organic Chemistry	Unit 2 Acids and Bases	Matter and its Interactions	Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	HS-PS1-3.
Science	HS	Honors Organic Chemistry	Unit 2 Acids and Bases	CHEM.A.1.1 Identify and describe how observable and measurable properties can be used to classify and describe matter and energy.	Relate the physical properties of matter to its atomic or molecular structure.	CHEM.A.1.1.4
Science	HS	Honors Organic Chemistry	Unit 2 Acids and Bases	CHEM.A.1.2 Compare the properties of mixtures.	Compare properties of solutions containing ionic or molecular solutes (e.g., dissolving, dissociating).	CHEM.A.1.2.1
Science	HS	Honors Organic Chemistry	Unit 2 Acids and Bases	CHEM.A.1.2 Compare the properties of mixtures.	Describe how factors (e.g., temperature, concentration, surface area) can affect solubility.	CHEM.A.1.2.3
Science	HS	Honors Organic Chemistry	Unit 2 Acids and Bases	CHEM.A.1.2 Compare the properties of mixtures.	Describe how chemical bonding can affect whether a substance dissolves in a given liquid.	CHEM.A.1.2.5

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Organic Chemistry	Unit 2 Acids and Bases	CHEM.B.1.4 Explain how models can be used to represent bonding.	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).	CHEM.B.1.4.1
Science	HS	Honors Organic Chemistry	Unit 2 Acids and Bases	CHEM.B.2.1 Predict what happens during a chemical reaction.	Classify reactions as synthesis, decomposition, single replacement, double replacement, or combustion.	CHEM.B.2.1.3
Science	HS	Honors Organic Chemistry	Unit 3 Alkanes and Cycloalkanes	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Apply a systematic set of rules (IUPAC) for naming compounds and writing chemical formulas (e.g., binary covalent, binary ionic, ionic compounds containing polyatomic ions).	CHEM.A.1.1.5
Science	HS	Honors Organic Chemistry	Unit 3 Alkanes and Cycloalkanes	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Describe how chemical bonding can affect whether a substance dissolves in a given liquid.	CHEM.A.1.2.5
Science	HS	Honors Organic Chemistry	Unit 3 Alkanes and Cycloalkanes	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Classify a bond as being polar covalent, nonpolar covalent, or ionic.	CHEM.B.1.3.2
Science	HS	Honors Organic Chemistry	Unit 3 Alkanes and Cycloalkanes	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Use illustrations to predict the polarity of a molecule.	CHEM.B.1.3.3
Science	HS	Honors Organic Chemistry	Unit 3 Alkanes and Cycloalkanes	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	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).	CHEM.B.1.4.1
Science	HS	Honors Organic Chemistry	Unit 3 Alkanes and Cycloalkanes	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Utilize Lewis dot structures to predict the structure and bonding in simple compounds	CHEM.B.1.4.2

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Organic Chemistry	Unit 3 Alkanes and Cycloalkanes	HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Classify and explain forces between molecules as dispersion, dipole-dipole or hydrogen bonding.	HS-PS1-3.a
Science	HS	Honors Organic Chemistry	Unit 4 Alkenes and Alkynes	Matter and its Interactions	Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	HS-PS1-3.
Science	HS	Honors Organic Chemistry	Unit 4 Alkenes and Alkynes	CHEM.A.1.1 Identify and describe how observable and measurable properties can be used to classify and describe matter and energy.	Relate the physical properties of matter to its atomic or molecular structure.	CHEM.A.1.1.4
Science	HS	Honors Organic Chemistry	Unit 4 Alkenes and Alkynes	CHEM.A.1.1 Identify and describe how observable and measurable properties can be used to classify and describe matter and energy.	Apply a systematic set of rules (IUPAC) for naming compounds and writing chemical formulas (e.g., binary covalent, binary ionic, ionic compounds containing polyatomic ions).	CHEM.A.1.1.5
Science	HS	Honors Organic Chemistry	Unit 4 Alkenes and Alkynes	CHEM.B.1.4 Explain how models can be used to represent bonding.	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).	CHEM.B.1.4.1
Science	HS	Honors Organic Chemistry	Unit 4 Alkenes and Alkynes	CHEM.B.2.1 Predict what happens during a chemical reaction.	Predict products of simple chemical reactions (e.g., synthesis, decomposition, single replacement, double replacement, combustion).	CHEM.B.2.1.4
Science	HS	Honors Organic Chemistry	Unit 5 Reactions of Alkenes and Alkynes	Matter and its Interactions	Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.	HS-PS1-2.
Science	HS	Honors Organic Chemistry	Unit 5 Reactions of Alkenes and Alkynes	CHEM.A.1.1 Identify and describe how observable and measurable properties can be used to classify and describe matter and energy.	Classify physical or chemical changes within a system in terms of matter and/or energy.	CHEM.A.1.1.1
Science	HS	Honors Organic Chemistry	Unit 5 Reactions of Alkenes and Alkynes	CHEM.B.2.1 Predict what happens during a chemical reaction.	Describe the roles of limiting and excess reactants in chemical reactions.	CHEM.B.2.1.1
Science	HS	Honors Organic Chemistry	Unit 5 Reactions of Alkenes and Alkynes	CHEM.B.2.1 Predict what happens during a chemical reaction.	Predict products of simple chemical reactions (e.g., synthesis, decomposition, single replacement, double replacement, combustion).	CHEM.B.2.1.4

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Organic Chemistry	Unit 6 Chirality	Matter and its Interactions	Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	HS-PS1-3.
Science	HS	Honors Organic Chemistry	Unit 6 Chirality	CHEM.A.1.1 Identify and describe how observable and measurable properties can be used to classify and describe matter and energy.	Apply a systematic set of rules (IUPAC) for naming compounds and writing chemical formulas (e.g., binary covalent, binary ionic, ionic compounds containing polyatomic ions).	CHEM.A.1.1.5
Science	HS	Honors Organic Chemistry	Unit 6 Chirality	CHEM.B.1.3 Explain how atoms form chemical bonds.	Classify a bond as being polar covalent, nonpolar covalent, or ionic.	CHEM.B.1.3.2
Science	HS	Honors Organic Chemistry	Unit 6 Chirality	CHEM.B.1.4 Explain how models can be used to represent bonding.	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).	CHEM.B.1.4.1
Science	HS	Honors Organic Chemistry	Unit 6 Chirality	CHEM.B.1.4 Explain how models can be used to represent bonding.	Utilize Lewis dot structures to predict the structure and bonding in simple compounds.	CHEM.B.1.4.2
Science	HS	Honors Organic Chemistry	Unit 7 Haloalkanes and Reaction Mechanisms	Matter and its Interactions	Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.	HS-PS1-2.
Science	HS	Honors Organic Chemistry	Unit 7 Haloalkanes and Reaction Mechanisms	CHEM.B.2.1 Predict what happens during a chemical reaction.	Predict products of simple chemical reactions (e.g., synthesis, decomposition, single replacement, double replacement, combustion).	CHEM.B.2.1.4
Science	HS	Honors Organic Chemistry	Unit 8 Alcohols	Matter and its Interactions	Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	HS-PS1-3.
Science	HS	Honors Organic Chemistry	Unit 8 Alcohols	CHEM.A.1.1 Identify and describe how observable and measurable properties can be used to classify and describe matter and energy.	Apply a systematic set of rules (IUPAC) for naming compounds and writing chemical formulas (e.g., binary covalent, binary ionic, ionic compounds containing polyatomic ions).	CHEM.A.1.1.5
Science	HS	Honors Organic Chemistry	Unit 8 Alcohols	CHEM.A.1.2 Compare the properties of mixtures.	Describe how chemical bonding can affect whether a substance dissolves in a given liquid.	CHEM.A.1.2.5
Science	HS	Honors Organic Chemistry	Unit 9 Benzene and its Derivatives	Matter and its Interactions	Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	HS-PS1-3.
Science	HS	Honors Organic Chemistry	Unit 9 Benzene and its Derivatives	CHEM.A.1.1 Identify and describe how observable and measurable properties can be used to classify and describe matter and energy.	Apply a systematic set of rules (IUPAC) for naming compounds and writing chemical formulas (e.g., binary covalent, binary ionic, ionic compounds containing polyatomic ions).	CHEM.A.1.1.5

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Organic Chemistry	Unit 9 Benzene and its Derivatives	CHEM.B.1.3 Explain how atoms form chemical bonds.	Classify a bond as being polar covalent, nonpolar covalent, or ionic.	CHEM.B.1.3.2
Science	HS	Honors Organic Chemistry	Unit 9 Benzene and its Derivatives	CHEM.B.1.4 Explain how models can be used to represent bonding.	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).	CHEM.B.1.4.1
Science	HS	Honors Organic Chemistry	Unit 10 Aldehydes and Ketones	Matter and its Interactions	Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	HS-PS1-3.
Science	HS	Honors Organic Chemistry	Unit 10 Aldehydes and Ketones	CHEM.A.1.1 Identify and describe how observable and measurable properties can be used to classify and describe matter and energy.	Apply a systematic set of rules (IUPAC) for naming compounds and writing chemical formulas (e.g., binary covalent, binary ionic, ionic compounds containing polyatomic ions)	CHEM.A.1.1.5
Science	HS	Honors Organic Chemistry	Unit 10 Aldehydes and Ketones	CHEM.B.1.4 Explain how models can be used to represent bonding.	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)	CHEM.B.1.4.1
Science	HS	Honors Organic Chemistry	Unit 10 Aldehydes and Ketones	Matter and its Interactions	Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	HS-PS1-7.
Science	HS	Honors Organic Chemistry	Unit 11 Carboxylic Acids and Derivatives	Matter and its Interactions	Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	HS-PS1-3.
Science	HS	Honors Organic Chemistry	Unit 11 Carboxylic Acids and Derivatives	CHEM.A.1.1 Identify and describe how observable and measurable properties can be used to classify and describe matter and energy.	Apply a systematic set of rules (IUPAC) for naming compounds and writing chemical formulas (e.g., binary covalent, binary ionic, ionic compounds containing polyatomic ions).	CHEM.A.1.1.5
Science	HS	Honors Organic Chemistry	Unit 11 Carboxylic Acids and Derivatives	CHEM.A.1.2 Compare the properties of mixtures.	Describe how chemical bonding can affect whether a substance dissolves in a given liquid.	CHEM.A.1.2.5
Science	HS	Honors Organic Chemistry	Unit 11 Carboxylic Acids and Derivatives	CHEM.B.1.3 Explain how atoms form chemical bonds.	Classify a bond as being polar covalent, nonpolar covalent, or ionic.	CHEM.B.1.3.2
Science	HS	Honors Organic Chemistry	Unit 11 Carboxylic Acids and Derivatives	CHEM.B.1.3 Explain how atoms form chemical bonds.	Use illustrations to predict the polarity of a molecule.	CHEM.B.1.3.3

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Organic Chemistry	Unit 11 Carboxylic Acids and Derivatives	CHEM.B.1.4 Explain how models can be used to represent bonding.	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).	CHEM.B.1.4.1
Science	HS	Honors Organic Chemistry	Unit 11 Carboxylic Acids and Derivatives	HS-PS1-3. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	Classify and explain forces between molecules as dispersion, dipole-dipole or hydrogen bonding.	HS-PS1-3.a
Science	HS	Honors Organic Chemistry	Unit 11 Carboxylic Acids and Derivatives	Matter and its Interactions	Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.	HS-PS1-2.
Science	HS	Honors Organic Chemistry	Unit 11 Carboxylic Acids and Derivatives	CHEM.B.2.1 Predict what happens during a chemical reaction.	Classify reactions as synthesis, decomposition, single replacement, double replacement, or combustion.	CHEM.B.2.1.3
Science	HS	Honors Organic Chemistry	Unit 11 Carboxylic Acids and Derivatives	CHEM.B.2.1 Predict what happens during a chemical reaction.	Predict products of simple chemical reactions (e.g., synthesis, decomposition, single replacement, double replacement, combustion).	CHEM.B.2.1.4
Science	HS	Honors Organic Chemistry	Unit 11 Carboxylic Acids and Derivatives	CHEM.B.2.1 Predict what happens during a chemical reaction.	Balance chemical equations by applying the Law of Conservation of Matter.	CHEM.B.2.1.5
Science	HS	Honors Organic Chemistry	Unit 12 Polymers	Matter and its Interactions	Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	HS-PS1-3.
Science	HS	Honors Organic Chemistry	Unit 12 Polymers	Matter and its Interactions	Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.	HS-PS1-2.
Science	HS	Honors Organic Chemistry	Unit 12 Polymers	CHEM.A.1.1 Identify and describe how observable and measurable properties can be used to classify and describe matter and energy.	Relate the physical properties of matter to its atomic or molecular structure.	CHEM.A.1.1.4
Science	HS	Honors Organic Chemistry	Unit 12 Polymers	CHEM.A.1.1 Identify and describe how observable and measurable properties can be used to classify and describe matter and energy.	Apply a systematic set of rules (IUPAC) for naming compounds and writing chemical formulas (e.g., binary covalent, binary ionic, ionic compounds containing polyatomic ions).	CHEM.A.1.1.5
Science	HS	Honors Organic Chemistry	Unit 12 Polymers	CHEM.B.1.3 Explain how atoms form chemical bonds.	Explain how atoms combine to form compounds through ionic and covalent bonding.	CHEM.B.1.3.1

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Honors Organic Chemistry	Unit 12 Polymers	CHEM.B.1.4 Explain how models can be used to represent bonding.	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).	CHEM.B.1.4.1
Science	HS	Honors Organic Chemistry	Unit 12 Polymers	CHEM.B.2.1 Predict what happens during a chemical reaction.	Classify reactions as synthesis, decomposition, single replacement, double replacement, or combustion.	CHEM.B.2.1.3
Science	HS	Honors Organic Chemistry	Unit 12 Polymers	CHEM.B.2.1 Predict what happens during a chemical reaction.	Predict products of simple chemical reactions (e.g., synthesis, decomposition, single replacement, double replacement, combustion).	CHEM.B.2.1.4
Science	HS	Ecology and Environment	Unit 1 - Sustainability and Environmental History	4.3: Natural Resources	Analyze factors that influence the local, regional, national, and global availability of natural resources.	4.3.12.B.a
Science	HS	Ecology and Environment	Unit 1 - Sustainability and Environmental History	4.3: Natural Resources	Analyze the social, economic, and political factors that affect the distribution and use of natural resources (e.g., wars, political systems, classism, racism).	4.3.12.B.b
Science	HS	Ecology and Environment	Unit 1 - Sustainability and Environmental History	4.3: Natural Resources	Explain how consumption rate affects the sustainability of resource use.	4.3.12.A
Science	HS	Ecology and Environment	Unit 1 - Sustainability and Environmental History	4.5: Humans and the Environment	Research laws and policies that address the sustainable use of natural resources	4.5.10.A
Science	HS	Ecology and Environment	Unit 1 - Sustainability and Environmental History	Examine the concept of sustainability (current and historical) as it relates to the human consumption of natural resources.	Examine the growth rate of the human population over time.	CYSCEE.1.01
Science	HS	Ecology and Environment	Unit 1 - Sustainability and Environmental History	Examine the concept of sustainability (current and historical) as it relates to the human consumption of natural resources.	Examine the history of natural resource consumption in the United States.	CYSCEE.1.02
Science	HS	Ecology and Environment	Unit 1 - Sustainability and Environmental History	Examine the concept of sustainability (current and historical) as it relates to the human consumption of natural resources.	Investigate the reasons for the creation of major environmental legislation in the United States.	CYSCEE.1.03
Science	HS	Ecology and Environment	Unit 1 - Sustainability and Environmental History	Examine the concept of sustainability (current and historical) as it relates to the human consumption of natural resources.	Discuss major global environmental issues and their root causes.	CYSCEE.1.04
Science	HS	Ecology and Environment	Unit 2: Interdependent Relationships in Ecosystems	Examine the fundamental principles of ecology.	Evaluate the efficiency of energy flow within food chains and food webs.	4.1.10.C.

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Ecology and Environment	Unit 2: Interdependent Relationships in Ecosystems	Examine the fundamental principles of ecology.	Analyze the significance of biological diversity in an ecosystem.	4.1.12.A.
Science	HS	Ecology and Environment	Unit 2: Interdependent Relationships in Ecosystems	Examine the fundamental principles of ecology.	Research practices that impact biodiversity in specific ecosystems.	4.1.10.D.
Science	HS	Ecology and Environment	Unit 2: Interdependent Relationships in Ecosystems	Examine the fundamental principles of ecology.	Examine the effects of limiting factors on population dynamics.	4.1.10.A.
Science	HS	Ecology and Environment	Unit 2: Interdependent Relationships in Ecosystems	Examine the fundamental principles of ecology.	Analyze how humans influence the pattern of natural changes (e.g., primary/secondary succession) in ecosystems over time.	4.1.10.E.
Science	HS	Ecology and Environment	Unit 2: Interdependent Relationships in Ecosystems	Examine the fundamental principles of ecology.	Explain the biotic (i.e., plant, animal, microbial communities) and abiotic (i.e., soil, air, water, and temperature) components of an ecosystem and their interaction.	CYSCEE.2.01
Science	HS	Ecology and Environment	Unit 2: Interdependent Relationships in Ecosystems	Examine the fundamental principles of ecology.	Differentiate between the major living components of ecosystems.	CYSCEE.2.02
Science	HS	Ecology and Environment	Unit 2: Interdependent Relationships in Ecosystems	Examine the fundamental principles of ecology.	Explain the processes involved in the water, carbon, nitrogen, and phosphorous cycles.	CYSCEE.2.03
Science	HS	Ecology and Environment	Unit 2: Interdependent Relationships in Ecosystems	Examine the fundamental principles of ecology.	Evaluate human influences on the water, carbon, nitrogen, and phosphorous cycles.	CYSCEE.2.04
Science	HS	Ecology and Environment	Unit 2: Interdependent Relationships in Ecosystems	Examine the fundamental principles of ecology.	Analyze the ways in which species interact with each other.	CYSCEE.2.05
Science	HS	Ecology and Environment	Unit 2: Interdependent Relationships in Ecosystems	Examine the fundamental principles of ecology.	Compare the similarities and differences in the major biomes (e.g., desert, tropical rain forest, temperate forest, coniferous forest, tundra) and the communities that inhabit them.	CYSCEE.2.06
Science	HS	Ecology and Environment	Unit 2: Interdependent Relationships in Ecosystems	Examine the fundamental principles of ecology.	Use quadrats and transects to collect both biotic and abiotic data within an ecosystem.	CYSCEE.2.07
Science	HS	Ecology and Environment	Unit 2: Interdependent Relationships in Ecosystems	Examine the fundamental principles of ecology.	Predict population size by using the capture/mark/recapture method and the removal method.	CYSCEE.2.08
Science	HS	Ecology and Environment	Unit 3: Aquatic Ecology	Examine the fundamental concepts of aquatic ecology.	Interpret physical, chemical, and biological data as a means of assessing the environmental quality of both lentic and lotic aquatic ecosystems.	CYSCEE.3.01
Science	HS	Ecology and Environment	Unit 3: Aquatic Ecology	Examine the fundamental concepts of aquatic ecology.	Apply appropriate techniques in the analysis of an aquatic ecosystem (e.g., water quality, biological diversity, erosion, sedimentation).	CYSCEE.3.02
Science	HS	Ecology and Environment	Unit 3: Aquatic Ecology	Examine the fundamental concepts of aquatic ecology.	Describe and analyze different types of wetlands.	CYSCEE.3.03
Science	HS	Ecology and Environment	Unit 3: Aquatic Ecology	Examine the fundamental concepts of aquatic ecology.	Explain how a wetland influences water quality, wildlife, and water retention.	CYSCEE.3.04
Science	HS	Ecology and Environment	Unit 3: Aquatic Ecology	Examine the fundamental concepts of aquatic ecology.	Compare and contrast the physical differences found in the stream continuum from headwater to mouth.	CYSCEE.3.05

Subject	Level	Course	Unit	Big Idea	Benchmarks	CY and NGSS
Science	HS	Ecology and Environment	Unit 3: Aquatic Ecology	Examine the fundamental concepts of aquatic ecology.	Assess the intended and unintended effects of public policies and regulations relating to water quality.	CYSCEE.3.06
Science	HS	Ecology and Environment	Unit 3: Aquatic Ecology	Examine the fundamental concepts of aquatic ecology.	Analyze factors that influence the local, regional, national, and global availability of water.	CYSCEE.3.07
Science	HS	Ecology and Environment	Unit 4: Energy and Air Quality	Examine the relationship between energy and air quality.	Evaluate the advantages and disadvantages of using alternative sources of energy.	4.3.12.A.
Science	HS	Ecology and Environment	Unit 4: Energy and Air Quality	Examine the relationship between energy and air quality.	Differentiate between perpetual, renewable, and nonrenewable sources of energy.	CYSCEE.4.01
Science	HS	Ecology and Environment	Unit 4: Energy and Air Quality	Examine the relationship between energy and air quality.	Identify and compare fuels used in industrial and agricultural societies.	CYSCEE.4.02
Science	HS	Ecology and Environment	Unit 4: Energy and Air Quality	Examine the relationship between energy and air quality.	Examine the relationships between nonrenewable resource consumption and acid deposition.	CYSCEE.4.03
Science	HS	Ecology and Environment	Unit 4: Energy and Air Quality	Examine the relationship between energy and air quality.	Use a model to describe how variations in the flow of energy into and out of Earth’s systems result in changes in climate.	CYSCEE.4.04
Science	HS	Ecology and Environment	Unit 4: Energy and Air Quality	Examine the relationship between energy and air quality.	Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.	CYSCEE.4.05