Arkansas Tutorials are designed specifically for the Arkansas Standards found in the Curriculum Framework documents to prepare students for English, reading, writing, math and science tests.

Biology Tutorials offer targeted instruction, practice, and review designed to help students develop fluency, deepen conceptual understanding, and apply scientific thinking skills. Students engage with the content in an interactive, feedback-rich environment as they progress through standards-aligned modules. By constantly honing their ability to explain and analyze biological scenarios, students build the depth of knowledge and higher-order skills required to demonstrate their mastery when put to the test.

In each module, the Learn It and Try It make complex ideas accessible through focused content, guided analysis, multi-modal representations, and personalized feedback as students reason through increasingly challenging problems. The Review It offers a high-impact summary of key concepts and relates those concepts to students' lives. The Test It assesses students' mastery of the module's concepts, providing granular performance data to students and teachers after each attempt. To help students focus on the content most relevant to them, unit-level pretests and posttests can quickly identify where students are strong and where they're still learning.

Unit 1: The Nature of Life

- **FROM ATOMS TO BIOSPHERE**
  - MC.2.B.1: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Construct a hierarchy of life from cells to ecosystems
  - CDL.7.B.17.a: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Describe the structure and function of the major parts of a plant: roots
  - CDL.7.B.17.b: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Describe the structure and function of the major parts of a plant: stems
  - CDL.7.B.17.c: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Describe the structure and function of the major parts of a plant: leaves
  - EBR.8.B.1: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Cite examples of abiotic and biotic factors of ecosystems
  - EBR.8.B.2: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Compare and contrast the characteristics of biomes
  - EBR.8.B.8.a: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Identify the properties of each of the five

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levels of ecology: organism

- EBR.8.B.8.b: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Identify the properties of each of the five levels of ecology: population
- EBR.8.B.8.c: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Identify the properties of each of the five levels of ecology: community
- EBR.8.B.8.d: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Identify the properties of each of the five levels of ecology: ecosystem
- EBR.8.B.8.e: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Identify the properties of each of the five levels of ecology: biosphere

- **CHARACTERISTICS OF LIFE**
  - MC.1.B.1.b: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: proteins
  - MC.2.B.2: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast prokaryotes and eukaryotes
  - EBR.8.B.8.a: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Identify the properties of each of the five levels of ecology: organism
  - MC.2.B.11: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Discuss homeostasis using thermoregulation as an example
  - MC.3.B.4.b: Molecules and Cells Students shall demonstrate an understanding of how cells obtain and use energy (energetics). Describe and model the conversion of light energy to chemical energy by photosynthetic organisms: light independent reactions
  - MC.3.B.5: Molecules and Cells Students shall demonstrate an understanding of how cells obtain and use energy (energetics). Compare and contrast cellular respiration and photosynthesis as energy conversion pathways
  - EBR.8.B.1: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Cite examples of abiotic and biotic factors of ecosystems
  - EBR.8.B.8.d: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Identify the properties of each of the five levels of ecology: ecosystem
  - CDL.7.B.8.a: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Compare and contrast life cycles of familiar organisms sexual reproduction

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- CDL.7.B.8.b: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Compare and contrast life cycles of familiar organisms asexual reproduction

Unit 2: The Chemistry of Life

- **BIOMOLECULES**
  - MC.1.B.1.a: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: carbohydrates
  - MC.1.B.1.b: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: proteins
  - MC.1.B.1.d: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: lipids
  - MC.1.B.1.e: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: nucleic acids
  - MC.1.B.1.c: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: enzymes
- **ENZYMES**
  - MC.1.B.1.c: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: enzymes
  - MC.1.B.2: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the relationship between an enzyme and its substrate molecule(s)

Unit 3: Cell Structure and Function

- **PROKARYOTIC AND EUKARYOTIC CELLS**
  - NS.12.B.4: Nature of Science Students shall demonstrate an understanding of current life science theories. Relate the development of the cell theory to current trends in cellular biology
  - MC.2.B.4: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Relate the function of the plasma (cell) membrane to its structure
  - MC.2.B.7.a: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: diffusion
  - MC.2.B.7.b: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: osmosis
  - MC.2.B.7.c: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms:

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- MC.2.B.7.d: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: exocytosis
- MC.2.B.7.e: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: phagocytosis
- MC.2.B.7.f: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: pinocytosis
- MC.2.B.11: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Discuss homeostasis using thermoregulation as an example
- MC.1.B.1.b: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: proteins
- MC.1.B.1.d: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: lipids
- MC.2.B.3.a: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Describe the role of sub-cellular structures in the life of a cell: organelles
- MC.2.B.3.b: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Describe the role of sub-cellular structures in the life of a cell: ribosomes
- MC.2.B.3.c: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Describe the role of sub-cellular structures in the life of a cell: cytoskeleton
- MC.3.B.1: Molecules and Cells Students shall demonstrate an understanding of how cells obtain and use energy (energetics). Compare and contrast the structure and function of mitochondria and chloroplasts
- MC.2.B.2: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast prokaryotes and eukaryotes
- MC.2.B.6: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast the functions of autotrophs and heterotrophs

- **PLANT AND ANIMAL CELLS**
  - MC.2.B.3.a: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Describe the role of sub-cellular structures in the life of a cell: organelles
  - MC.2.B.5: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast the structures of an animal cell to a plant cell

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- MC.2.B.4: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Relate the function of the plasma (cell) membrane to its structure
- MC.3.B.1: Molecules and Cells Students shall demonstrate an understanding of how cells obtain and use energy (energetics). Compare and contrast the structure and function of mitochondria and chloroplasts

Unit 4: Active and Passive Transport

- **PASSIVE TRANSPORT**
  - MC.1.B.1.b: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: proteins
  - MC.2.B.3.a: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Describe the role of sub-cellular structures in the life of a cell: organelles
  - MC.2.B.4: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Relate the function of the plasma (cell) membrane to its structure
  - MC.2.B.7.a: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: diffusion
  - MC.2.B.7.b: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: osmosis
  - MC.2.B.7.c: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: endocytosis
  - MC.2.B.7.d: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: exocytosis
  - MC.2.B.7.e: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: phagocytosis
  - MC.2.B.7.f: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: pinocytosis
  - MC.2.B.11: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Discuss homeostasis using thermoregulation as an example
- **ACTIVE TRANSPORT**
  - MC.2.B.4: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Relate the function of the plasma (cell) membrane to its structure
  - MC.2.B.7.c: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms:

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- MC.2.B.7.d: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: exocytosis
- MC.2.B.7.e: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: phagocytosis
- MC.2.B.7.f: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: pinocytosis
- MC.2.B.11: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Discuss homeostasis using thermoregulation as an example
- MC.2.B.7.a: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: diffusion
- MC.2.B.7.b: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: osmosis

Unit 5: Cellular Energetics

- **PHOTOSYNTHESIS**
  - MC.1.B.4.c: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Explain the role of energy in chemical reactions of living systems: endergonic reactions
  - MC.2.B.6: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast the functions of autotrophs and heterotrophs
  - MC.3.B.4.a: Molecules and Cells Students shall demonstrate an understanding of how cells obtain and use energy (energetics). Describe and model the conversion of light energy to chemical energy by photosynthetic organisms: light dependent reactions
  - MC.3.B.4.b: Molecules and Cells Students shall demonstrate an understanding of how cells obtain and use energy (energetics). Describe and model the conversion of light energy to chemical energy by photosynthetic organisms: light independent reactions
  - MC.3.B.5: Molecules and Cells Students shall demonstrate an understanding of how cells obtain and use energy (energetics). Compare and contrast cellular respiration and photosynthesis as energy conversion pathways
  - MC.3.B.1: Molecules and Cells Students shall demonstrate an understanding of how cells obtain and use energy (energetics). Compare and contrast the structure and function of mitochondria and chloroplasts
- **CELLULAR RESPIRATION**

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- MC.2.B.3.a: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Describe the role of sub-cellular structures in the life of a cell: organelles
- MC.3.B.2.a: Molecules and Cells Students shall demonstrate an understanding of how cells obtain and use energy (energetics). Describe and model the conversion of stored energy in organic molecules into usable cellular energy (ATP): glycolysis
- MC.3.B.2.b: Molecules and Cells Students shall demonstrate an understanding of how cells obtain and use energy (energetics). Describe and model the conversion of stored energy in organic molecules into usable cellular energy (ATP): citric acid cycle
- MC.3.B.2.c: Molecules and Cells Students shall demonstrate an understanding of how cells obtain and use energy (energetics). Describe and model the conversion of stored energy in organic molecules into usable cellular energy (ATP): electron transport chain
- MC.3.B.5: Molecules and Cells Students shall demonstrate an understanding of how cells obtain and use energy (energetics). Compare and contrast cellular respiration and photosynthesis as energy conversion pathways
- MC.1.B.4.b: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Explain the role of energy in chemical reactions of living systems: exergonic reactions
- MC.2.B.3.c: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Describe the role of sub-cellular structures in the life of a cell: cytoskeleton
- MC.2.B.7.c: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: endocytosis
- MC.2.B.7.d: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: exocytosis
- MC.2.B.7.e: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: phagocytosis
- MC.2.B.7.f: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast active transport and passive transport mechanisms: pinocytosis
- MC.3.B.1: Molecules and Cells Students shall demonstrate an understanding of how cells obtain and use energy (energetics). Compare and contrast the structure and function of mitochondria and chloroplasts

Unit 6: Cell Growth and Reproduction

- **THE CELL CYCLE**
  - MC.2.B.8.a: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Describe the main events in the cell cycle, including the differences in plant and animal cell division: interphase

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- MC.2.B.8.b: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Describe the main events in the cell cycle, including the differences in plant and animal cell division: mitosis
- MC.2.B.8.c: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Describe the main events in the cell cycle, including the differences in plant and animal cell division: cytokinesis
- CDL.7.B.8.b: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Compare and contrast life cycles of familiar organisms asexual reproduction
- MC.2.B.9.a: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. List in order and describe the stages of mitosis: prophase
- MC.2.B.9.b: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. List in order and describe the stages of mitosis: metaphase
- MC.2.B.9.c: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. List in order and describe the stages of mitosis: anaphase
- HE.5.B.4: Heredity and Evolution Students shall investigate the molecular basis of genetics. Describe and model the processes of replication, transcription, and translation
- MC.2.B.9.d: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. List in order and describe the stages of mitosis: telophase.
- MC.1.B.1.a: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: carbohydrates
- MC.1.B.1.b: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: proteins
- MC.1.B.1.d: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: lipids
- MC.1.B.1.e: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: nucleic acids

- **MITOSIS**
  - MC.2.B.8.a: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Describe the main events in the cell cycle, including the differences in plant and animal cell division: interphase
  - MC.2.B.8.b: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Describe the main events in the cell cycle, including the differences in plant and animal cell division: mitosis

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- MC.2.B.9.a: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. List in order and describe the stages of mitosis: prophase
- MC.2.B.9.b: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. List in order and describe the stages of mitosis: metaphase
- MC.2.B.9.c: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. List in order and describe the stages of mitosis: anaphase
- MC.2.B.9.d: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. List in order and describe the stages of mitosis: telophase.
- MC.2.B.10: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Analyze the meiotic maintenance of a constant chromosome number from one generation to the next
- MC.2.B.8.c: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Describe the main events in the cell cycle, including the differences in plant and animal cell division: cytokinesis

Unit 7: DNA Structure and Function

- **COMPONENTS OF DNA**
  - MC.1.B.1.e: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: nucleic acids
  - HE.5.B.1: Heredity and Evolution Students shall investigate the molecular basis of genetics. Model the components of a DNA nucleotide and an RNA nucleotide
  - HE.5.B.2: Heredity and Evolution Students shall investigate the molecular basis of genetics. Describe the Watson-Crick double helix model of DNA, using the base-pairing rule (adenine-thymine, cytosine-guanine)
  - HE.5.B.3: Heredity and Evolution Students shall investigate the molecular basis of genetics. Compare and contrast the structure and function of DNA and RNA
  - HE.4.B.5: Heredity and Evolution Students shall demonstrate an understanding of heredity. Analyze the historically significant work of prominent geneticists
- **THE GENETIC CODE**
  - MC.1.B.1.e: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: nucleic acids
  - MC.2.B.3.b: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Describe the role of sub-cellular structures in the life of a cell: ribosomes
  - HE.5.B.2: Heredity and Evolution Students shall investigate the molecular basis of genetics. Describe the Watson-Crick double helix model of DNA, using the base-pairing rule (adenine-thymine, cytosine-guanine)

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- HE.5.B.3: Heredity and Evolution Students shall investigate the molecular basis of genetics. Compare and contrast the structure and function of DNA and RNA
- HE.5.B.4: Heredity and Evolution Students shall investigate the molecular basis of genetics. Describe and model the processes of replication, transcription, and translation
- MC.1.B.1.b: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: proteins

- **DNA REPLICATION**
  - HE.5.B.1: Heredity and Evolution Students shall investigate the molecular basis of genetics. Model the components of a DNA nucleotide and an RNA nucleotide
  - HE.5.B.4: Heredity and Evolution Students shall investigate the molecular basis of genetics. Describe and model the processes of replication, transcription, and translation

Unit 8: Gene Expression

- **TRANSCRIPTION**
  - MC.1.B.1.e: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: nucleic acids
  - HE.5.B.1: Heredity and Evolution Students shall investigate the molecular basis of genetics. Model the components of a DNA nucleotide and an RNA nucleotide
  - HE.5.B.3: Heredity and Evolution Students shall investigate the molecular basis of genetics. Compare and contrast the structure and function of DNA and RNA
  - MC.2.B.3.b: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Describe the role of sub-cellular structures in the life of a cell: ribosomes
  - HE.5.B.4: Heredity and Evolution Students shall investigate the molecular basis of genetics. Describe and model the processes of replication, transcription, and translation
- **TRANSLATION**
  - MC.1.B.1.e: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: nucleic acids
  - HE.5.B.3: Heredity and Evolution Students shall investigate the molecular basis of genetics. Compare and contrast the structure and function of DNA and RNA
  - HE.5.B.4: Heredity and Evolution Students shall investigate the molecular basis of genetics. Describe and model the processes of replication, transcription, and translation
  - MC.1.B.1.b: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: proteins

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- MC.1.B.1.c: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: enzymes
- MC.1.B.2: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the relationship between an enzyme and its substrate molecule(s)

Unit 9: Mutations

- **GENETIC CHANGES IN DNA**
  - MC.1.B.1.b: Molecules and Cells Students shall demonstrate an understanding of the role of chemistry in life processes. Describe the structure and function of the major organic molecules found in living systems: proteins
  - HE.5.B.6.b: Heredity and Evolution Students shall investigate the molecular basis of genetics. Identify effects of changes brought about by mutations: harmful
  - HE.5.B.6.c: Heredity and Evolution Students shall investigate the molecular basis of genetics. Identify effects of changes brought about by mutations: neutral
  - HE.5.B.6.a: Heredity and Evolution Students shall investigate the molecular basis of genetics. Identify effects of changes brought about by mutations: beneficial
  - HE.5.B.5: Heredity and Evolution Students shall investigate the molecular basis of genetics. Compare and contrast the different types of mutation events, including point mutation, frameshift mutation, deletion, and inversion
  - HE.6.B.2: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Recognize that evolution involves a change in allele frequencies in a population across successive generations
- **GENETIC CHANGES IN CHROMOSOMES**
  - NS.12.B.6: Nature of Science Students shall demonstrate an understanding of current life science theories. Relate the chromosome theory of heredity to recent findings in genetic research (e.g., Human Genome Project-HGP, chromosome therapy)
  - MC.2.B.10: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Analyze the meiotic maintenance of a constant chromosome number from one generation to the next
  - HE.5.B.6.b: Heredity and Evolution Students shall investigate the molecular basis of genetics. Identify effects of changes brought about by mutations: harmful
  - HE.5.B.6.c: Heredity and Evolution Students shall investigate the molecular basis of genetics. Identify effects of changes brought about by mutations: neutral
  - HE.4.B.4.c: Heredity and Evolution Students shall demonstrate an understanding of heredity. Examine different modes of inheritance: crossing over
  - HE.4.B.6.a: Heredity and Evolution Students shall demonstrate an understanding of heredity. Evaluate karyotypes for abnormalities: monosomy

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- HE.4.B.6.b: Heredity and Evolution Students shall demonstrate an understanding of heredity. Evaluate karyotypes for abnormalities: trisomy

Unit 10: Heredity

- **MENDELIAN LAWS OF HEREDITY**
  - HE.4.B.1: Heredity and Evolution Students shall demonstrate an understanding of heredity. Summarize the outcomes of Gregor Mendels experimental procedures
  - HE.4.B.2.a: Heredity and Evolution Students shall demonstrate an understanding of heredity. Differentiate among the laws and principles of inheritance: dominance
  - HE.4.B.2.b: Heredity and Evolution Students shall demonstrate an understanding of heredity. Differentiate among the laws and principles of inheritance: segregation
  - HE.4.B.2.c: Heredity and Evolution Students shall demonstrate an understanding of heredity. Differentiate among the laws and principles of inheritance: independent assortment
  - HE.4.B.4.d: Heredity and Evolution Students shall demonstrate an understanding of heredity. Examine different modes of inheritance: incomplete dominance
  - HE.4.B.4.e: Heredity and Evolution Students shall demonstrate an understanding of heredity. Examine different modes of inheritance: multiple alleles
  - HE.4.B.5: Heredity and Evolution Students shall demonstrate an understanding of heredity. Analyze the historically significant work of prominent geneticists
  - HE.6.B.2: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Recognize that evolution involves a change in allele frequencies in a population across successive generations
  - NS.10.B.4.d: Nature of Science Students shall demonstrate an understanding that science is a way of knowing. Summarize the guidelines of science: scientific knowledge must have peer review and verification before acceptance
  - HE.4.B.3: Heredity and Evolution Students shall demonstrate an understanding of heredity. Use the laws of probability and Punnett squares to predict genotypic and phenotypic ratios
  - NS.13.B.1: Nature of Science Students shall use mathematics, science equipment, and technology as tools to communicate and solve life science problems. Collect and analyze scientific data using appropriate mathematical calculations, figures, and tables
- **MULTIPLE ALLELES AND ALLELES WITHOUT DOMINANCE**
  - HE.4.B.2.a: Heredity and Evolution Students shall demonstrate an understanding of heredity. Differentiate among the laws and principles of inheritance: dominance
  - HE.4.B.3: Heredity and Evolution Students shall demonstrate an understanding of heredity. Use the laws of probability and Punnett squares to predict genotypic and phenotypic ratios
  - HE.4.B.4.d: Heredity and Evolution Students shall demonstrate an understanding of heredity. Examine different modes of inheritance: incomplete dominance

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- HE.4.B.4.e: Heredity and Evolution Students shall demonstrate an understanding of heredity. Examine different modes of inheritance: multiple alleles
- HE.4.B.4.b: Heredity and Evolution Students shall demonstrate an understanding of heredity. Examine different modes of inheritance: codominance
- HE.6.B.2: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Recognize that evolution involves a change in allele frequencies in a population across successive generations

Unit 11: Reproduction

- **MEIOSIS**
  - MC.2.B.10: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Analyze the meiotic maintenance of a constant chromosome number from one generation to the next
  - HE.4.B.2.c: Heredity and Evolution Students shall demonstrate an understanding of heredity. Differentiate among the laws and principles of inheritance: independent assortment
  - HE.4.B.4.c: Heredity and Evolution Students shall demonstrate an understanding of heredity. Examine different modes of inheritance: crossing over
  - HE.6.B.2: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Recognize that evolution involves a change in allele frequencies in a population across successive generations
  - HE.6.B.3: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Analyze the effects of mutations and the resulting variations within a population in terms of natural selection
- **SEXUAL AND ASEXUAL REPRODUCTION**
  - CDL.7.B.8.a: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Compare and contrast life cycles of familiar organisms sexual reproduction
  - MC.2.B.8.a: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Describe the main events in the cell cycle, including the differences in plant and animal cell division: interphase
  - MC.2.B.8.b: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Describe the main events in the cell cycle, including the differences in plant and animal cell division: mitosis
  - MC.2.B.9.a: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. List in order and describe the stages of mitosis: prophase
  - MC.2.B.9.b: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. List in order and describe the stages of mitosis: metaphase
  - MC.2.B.9.c: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. List in order and describe the stages of mitosis: anaphase

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- CDL.7.B.8.b: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Compare and contrast life cycles of familiar organisms asexual reproduction
- MC.2.B.9.d: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. List in order and describe the stages of mitosis: telophase.

Unit 12: Evolution

- **MULTIPLE LINES OF EVIDENCE**
  - MC.3.B.2.b: Molecules and Cells Students shall demonstrate an understanding of how cells obtain and use energy (energetics). Describe and model the conversion of stored energy in organic molecules into usable cellular energy (ATP): citric acid cycle
  - HE.6.B.4: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Illustrate mass extinction events using a time line
  - HE.6.B.5.a: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Evaluate evolution in terms of evidence as found in the following: fossil record
  - HE.6.B.5.d: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Evaluate evolution in terms of evidence as found in the following: morphology
  - NS.12.B.3: Nature of Science Students shall demonstrate an understanding of current life science theories. Summarize biological evolution
  - HE.6.B.5.g: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Evaluate evolution in terms of evidence as found in the following: geographic distribution of related species
  - HE.6.B.5.e: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Evaluate evolution in terms of evidence as found in the following: embryology
  - HE.6.B.7: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Interpret a Cladogram
  - HE.6.B.5.b: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Evaluate evolution in terms of evidence as found in the following: DNA analysis
  - HE.6.B.6: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Compare the processes of relative dating and radioactive dating to determine the age of fossils
- **THE FOSSIL RECORD**
  - HE.6.B.4: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Illustrate mass extinction events using a time line
  - HE.6.B.5.a: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Evaluate evolution in terms of evidence as found in the following: fossil record
  - HE.6.B.5.d: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Evaluate evolution in terms of evidence as found in the following: morphology

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- NS.12.B.3: Nature of Science Students shall demonstrate an understanding of current life science theories. Summarize biological evolution
- HE.6.B.6: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Compare the processes of relative dating and radioactive dating to determine the age of fossils

Unit 13: Mechanisms of Evolution

- **NATURAL SELECTION**
  - HE.6.B.3: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Analyze the effects of mutations and the resulting variations within a population in terms of natural selection
  - NS.12.B.3: Nature of Science Students shall demonstrate an understanding of current life science theories. Summarize biological evolution
  - HE.6.B.1: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Compare and contrast Lamarcks explanation of evolution with Darwins theory of evolution by natural selection
  - EBR.8.B.5: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Identify and predict the factors that control population, including predation, competition, crowding, water, nutrients, and shelter
  - HE.6.B.5.c: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Evaluate evolution in terms of evidence as found in the following: artificial selection
- **EVOLUTION OF SPECIES**
  - NS.12.B.3: Nature of Science Students shall demonstrate an understanding of current life science theories. Summarize biological evolution
  - HE.6.B.3: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Analyze the effects of mutations and the resulting variations within a population in terms of natural selection
  - HE.6.B.5.a: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Evaluate evolution in terms of evidence as found in the following: fossil record
  - HE.6.B.1: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Compare and contrast Lamarcks explanation of evolution with Darwins theory of evolution by natural selection

Unit 14: Classification

- **TAXONOMY**
  - CDL.7.B.2.f: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Differentiate the characteristics of the six kingdoms: Animalia
  - CDL.7.B.3.a: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Identify the seven major taxonomic categories: kingdom

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- CDL.7.B.3.b: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Identify the seven major taxonomic categories: phylum
- CDL.7.B.3.c: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Identify the seven major taxonomic categories: class
- CDL.7.B.3.d: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Identify the seven major taxonomic categories: order
- CDL.7.B.3.e: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Identify the seven major taxonomic categories: family
- CDL.7.B.3.f: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Identify the seven major taxonomic categories: genus
- CDL.7.B.3.g: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Identify the seven major taxonomic categories: species
- CDL.7.B.4: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Classify and name organisms based on their similarities and differences applying taxonomic nomenclature using dichotomous keys
- HE.6.B.7: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Interpret a Cladogram
- CDL.7.B.2.e: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Differentiate the characteristics of the six kingdoms: Plantae

- **THE SIX KINGDOMS**
  - MC.2.B.5: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast the structures of an animal cell to a plant cell
  - CDL.7.B.1.a: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Differentiate among the different domains: Bacteria
  - CDL.7.B.1.b: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Differentiate among the different domains: Archaea
  - CDL.7.B.1.c: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Differentiate among the different domains: Eukarya
  - CDL.7.B.2.a: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Differentiate the characteristics of the six kingdoms: Eubacteria
  - CDL.7.B.2.b: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Differentiate the characteristics of the six kingdoms: Archaea
  - CDL.7.B.2.c: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Differentiate the characteristics of the six kingdoms: Protista
  - CDL.7.B.2.d: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Differentiate the characteristics of the six kingdoms: Fungi

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- CDL.7.B.2.e: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Differentiate the characteristics of the six kingdoms: Plantae
- CDL.7.B.2.f: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Differentiate the characteristics of the six kingdoms: Animalia
- CDL.7.B.3.a: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Identify the seven major taxonomic categories: kingdom
- CDL.7.B.3.b: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Identify the seven major taxonomic categories: phylum
- CDL.7.B.3.c: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Identify the seven major taxonomic categories: class
- CDL.7.B.3.d: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Identify the seven major taxonomic categories: order
- CDL.7.B.3.e: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Identify the seven major taxonomic categories: family
- CDL.7.B.3.f: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Identify the seven major taxonomic categories: genus
- CDL.7.B.3.g: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Identify the seven major taxonomic categories: species
- CDL.7.B.9: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Classify bacteria according to their characteristics and adaptations
- CDL.7.B.11.a: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Describe the characteristics used to classify protists: plant-like
- CDL.7.B.11.b: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Describe the characteristics used to classify protists: animal-like
- CDL.7.B.11.c: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Describe the characteristics used to classify protists: fungal-like
- CDL.7.B.13: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Compare and contrast fungi with other eukaryotic organisms
- HE.6.B.7: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Interpret a Cladogram
- CDL.7.B.8.a: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Compare and contrast life cycles of familiar organisms sexual reproduction
- CDL.7.B.8.b: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Compare and contrast life cycles of familiar organisms asexual reproduction
- CDL.7.B.14: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Evaluate the medical and economic importance of fungi

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- CDL.7.B.15: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Differentiate between vascular and nonvascular plants
- CDL.7.B.16: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Differentiate among cycads, gymnosperms, and angiosperms
- CDL.7.B.21: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Compare and contrast the major invertebrate classes according to their nervous, respiratory, excretory, circulatory, and digestive systems
- CDL.7.B.22: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Compare and contrast the major vertebrate classes according to their nervous, respiratory, excretory, circulatory, digestive, reproductive and integumentary systems
- CDL.7.B.20.a: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Identify the symmetry of organisms: radial
- CDL.7.B.20.b: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Identify the symmetry of organisms: bilateral
- CDL.7.B.20.c: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Identify the symmetry of organisms: asymmetrical

Unit 15: Homeostasis

- **HOMEOSTASIS AND DYNAMIC EQUILIBRIUM**
  - MC.2.B.11: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Discuss homeostasis using thermoregulation as an example
  - MC.2.B.1: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Construct a hierarchy of life from cells to ecosystems
- **FEEDBACK MECHANISMS IN ANIMALS**
  - MC.2.B.11: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Discuss homeostasis using thermoregulation as an example
  - MC.2.B.1: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Construct a hierarchy of life from cells to ecosystems

Unit 16: Functions of Plant Systems

- **PLANT TISSUES**
  - CDL.7.B.17.a: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Describe the structure and function of the major parts of a plant: roots
  - CDL.7.B.17.b: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Describe the structure and function of the major parts of a plant: stems
  - CDL.7.B.17.c: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Describe the structure and function of the major parts of a plant: leaves

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- CDL.7.B.18.a: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Relate the structure of plant tissue to its function epidermal
- CDL.7.B.18.b: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Relate the structure of plant tissue to its function ground
- CDL.7.B.18.c: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Relate the structure of plant tissue to its function vascular
- CDL.7.B.17.d: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Describe the structure and function of the major parts of a plant: flowers

- **PLANT RESPONSES**
  - CDL.7.B.17.a: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Describe the structure and function of the major parts of a plant: roots
  - CDL.7.B.17.b: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Describe the structure and function of the major parts of a plant: stems
  - CDL.7.B.17.c: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Describe the structure and function of the major parts of a plant: leaves
  - CDL.7.B.18.a: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Relate the structure of plant tissue to its function epidermal
  - CDL.7.B.18.b: Classification and the Diversity of Life Students shall demonstrate an understanding that organisms are diverse. Relate the structure of plant tissue to its function ground

Unit 17: Functions of Animal Systems

- **THE NERVOUS SYSTEM**
  - MC.2.B.1: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Construct a hierarchy of life from cells to ecosystems
- **THE IMMUNE AND LYMPHATIC SYSTEMS**
  - MC.2.B.11: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Discuss homeostasis using thermoregulation as an example

Unit 18: Matter and Energy

- **FOOD CHAINS AND WEBS**
  - MC.2.B.6: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast the functions of autotrophs and heterotrophs
  - EBR.8.B.4: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Analyze an ecosystems energy flow through food chains, food webs, and energy pyramids
  - EBR.8.B.5: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Identify and predict the factors that control population, including predation, competition, crowding, water, nutrients, and shelter

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- EBR.8.B.4: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Analyze an ecosystems energy flow through food chains, food webs, and energy pyramids
- EBR.8.B.4: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Analyze an ecosystems energy flow through food chains, food webs, and energy pyramids
- EBR.8.B.4: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Analyze an ecosystems energy flow through food chains, food webs, and energy pyramids

- **PYRAMIDS OF ENERGY, NUMBERS, AND BIOMASS**
  - MC.2.B.6: Molecules and Cells Students shall demonstrate an understanding of the structure and function of cells. Compare and contrast the functions of autotrophs and heterotrophs
  - EBR.8.B.4: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Analyze an ecosystems energy flow through food chains, food webs, and energy pyramids
  - EBR.8.B.1: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Cite examples of abiotic and biotic factors of ecosystems
  - EBR.8.B.4: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Analyze an ecosystems energy flow through food chains, food webs, and energy pyramids
  - EBR.8.B.5: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Identify and predict the factors that control population, including predation, competition, crowding, water, nutrients, and shelter
  - EBR.8.B.4: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Analyze an ecosystems energy flow through food chains, food webs, and energy pyramids

Unit 19: Cycles in Nature

- **THE CARBON CYCLE**
  - EBR.8.B.3: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Diagram the carbon, nitrogen, phosphate, and water cycles in an ecosystem
  - EBR.9.B.1: Ecology and Behavioral Relationships Students shall demonstrate an understanding of the ecological impact of global issues. Analyze the effects of human population growth and technology on the environment/biosphere
  - EBR.9.B.3: Ecology and Behavioral Relationships Students shall demonstrate an understanding of the ecological impact of global issues. Assess current world issues applying scientific themes (e.g., global

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changes in climate, epidemics, pandemics, ozone depletion, UV radiation, natural resources, use of technology, and public policy)

- **THE NITROGEN AND PHOSPHORUS CYCLES**
  - EBR.8.B.3: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Diagram the carbon, nitrogen, phosphate, and water cycles in an ecosystem
  - EBR.8.B.1: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Cite examples of abiotic and biotic factors of ecosystems

Unit 20: Ecology of Succession

- **SUCCESSION IN COMMUNITIES**
  - EBR.8.B.1: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Cite examples of abiotic and biotic factors of ecosystems
  - EBR.8.B.7: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Compare and contrast primary succession with secondary succession
- **NATURAL IMPACTS ON ECOSYSTEMS**
  - EBR.8.B.7: Ecology and Behavioral Relationships Students shall demonstrate an understanding of ecological and behavioral relationships among organisms. Compare and contrast primary succession with secondary succession
  - HE.6.B.4: Heredity and Evolution Students shall examine the development of the theory of biological evolution. Illustrate mass extinction events using a time line

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