

MVS Course Alignment Document

Biology MMC

STANDARD B1: INQUIRY, REFLECTION, AND SOCIAL IMPLICATIONS

B1.1	Scientific Inquiry	Unit	Lesson	Resources Used
B1.1A	Generate new questions that can be investigated in the laboratory or field.	1	1	Etxt 14-20; Gizmos: Estimating Population Size
B1.1B	Evaluate the uncertainties or validity of scientific conclusions using an understanding of sources of measurement error, the challenges of controlling variables, accuracy of data analysis, logic of argument, logic of experimental design, and/or the dependence on underlying assumptions.	1	1,2	Etxt p 14-20; Teachers Domain Fuel Cells & Snapshot of US Energy Use Critical Review of Information Essay. United Streaming: The Conservation of Matter
B1.1C	Conduct scientific investigations using appropriate tools and techniques (e.g., selecting an instrument that measures the desired quantity—length, volume, weight, time interval, temperature—with the appropriate level of precision).	1	1	Etxt p 14-20; website on microscopes; Gizmos: Estimating Population Size; audio/visual presentation on types of microscopes
B1.1D	Identify patterns in data and relate them to theoretical models.	1	1	Etxt p 14-20; Gizmos: Estimating Population Size; chap 1 exercise Analyzing Experimental Data
B1.1E	Describe a reason for a given conclusion using evidence from an investigation.	1	1	Etxt p 14-20; United Streaming Video: The Conservation of Matter, essay based on video
B1.1f	Predict what would happen if the variables, methods, or timing of an investigation were changed.	1, 3	1, 1	Gizmos: Estimating Population Size, Gizmos: Osmosis
B1.1g	Based on empirical evidence, explain and critique the reasoning used to draw a scientific conclusion or explanation.	1	1,2	Etxt p 386-400; Gizmos: Estimating Population Size; Critical Review of Information essay
B1.1h	Design and conduct a systematic scientific investigation that tests a hypothesis. Draw conclusions from data presented in charts or tables.	1	2	Etxt p 14-20; Gizmos: Estimating Population Size
B1.1i	Distinguish between scientific explanations that are regarded as current scientific consensus and the emerging questions that active researchers investigate.	1	2	Critical Review of Information essay
B1.1i	Distinguish between scientific explanations that are regarded as current scientific consensus and the emerging questions that active researchers investigate.	5	1	Etxt p 251-268; Teachers Domain videos and essay
B1.2	Scientific Reflection and Social Implications	Unit	Lesson	Resources Used
B1.2A	Critique whether or not specific questions can be answered through scientific investigations.	4	3	Etxt p 361-378; Teachers Domain video and essay
B1.2B	Identify and critique arguments about personal or societal issues based on scientific evidence.	4	3	Etxt p 361-378; Teachers Domain video and essay
B1.2C	Develop an understanding of a scientific concept by accessing information from multiple sources. Evaluate the scientific accuracy and significance of the information.	1	2	Etxt p 386-400; Article: Global Warming - Why We Don't Believe It discussion board posting, Critical Review of Information Essay
B1.2D	Evaluate scientific explanations in a peer review process or discussion format.	1	2	Discussion board posting and reponse to peers - article
B1.2E	Evaluate the future career and occupational prospects of science fields.	1	2	Etxt p 14-20 and 386-400; research a career in environmental science and write a paper

B1.2f	Critique solutions to problems, given criteria and scientific constraints.	1	2	United Streaming Video: Connected Systems: Biodiversity, Ecosystems, and Ecology; article: Global Warming
B1.2g	Identify scientific tradeoffs in design decisions and choose among alternative solutions.	1	2	United Streaming Video: Connected Systems: Biodiversity, Ecosystems, and Ecology; article: Global Warming
B1.2h	Describe the distinctions between scientific theories, laws, hypotheses, and observations.	1	1	United Streaming Video: Conservation of Matter and associated essay; etxt pg 14-20
B1.2i	Explain the progression of ideas and explanations that lead to science theories that are part of the current scientific consensus or core knowledge.	1	1	United Streaming Video: Conservation of Matter and associated essay; etxt pg 14-20
B1.2j	Apply science principles or scientific data to anticipate effects of technological design decisions.	4	3	Etxt p 361-378; Teachers Domain video and essay
B1.2k	Analyze how science and society interact from a historical, political, economic, or social perspective.	4	3	Etxt p 361-378; Teachers Domain video and essay

Standard B2: FORMS OF ENERGY				
B2.1	Transformation of Matter and Energy in Cells	Unit	Lesson	Resources Used
B2.1A	Explain how cells transform energy from one form to another through the process of photosynthesis and respiration. Identify the reactants and products in the general reaction of photosynthesis	2	2	Etxt p 93-110; United Streaming video: Elements of Biology - Matter and Energy; Gizmos: Cell Energy Cycle; Photosynthesis Lab; Photosynthesis Activity B; Graphic Organizer and essay on plant and animal cells
B2.1B	Compare and contrast the transformation of matter and energy during photosynthesis and respiration	2	2	Etxt p 93-110; United Streaming video: Elements of Biology - Matter and Energy; Gizmos: Cell Energy Cycle; Photosynthesis Lab; Photosynthesis Activity B; Graphic Organizer and essay on plant and animal cells; Teachers Domain: The Powerhouse of the Cell
B2.1C	Explain cell division, growth, and development as a consequence of an increase in cell number, cell size, and/or cell products	3	1	Etxt p 117-132; Teachers Domain: How Cells Divide; Gizmos: Cell Division
B2.1x	Cell Differentiation	Unit	Lesson	Resources Used
B2.1d	Describe how, though cell division, cells can become specialized for specific function	3	2	Etxt p 140-154; Teachers Domain: Cell Differentiation, Organelles in the Cytoplasm, The Embryo Takes Shape; essay based on Teachers Domain resources
B2.1e	Predict what would happen if the cells from one part of a developing embryo were transplanted to another part of the embryo	3	2	Etxt p 140-154; Teachers Domain: Cell: The Embryo Takes Shape; essay based on Teachers Domain resources
B2.2	Organic Molecules	Unit	Lesson	Resources Used
B2.2A	Explain how carbon can join to other carbon atoms in chains and rings to form large and complex molecules	1	1	Etxt p27-42, United Streaming, Venn Diagram, essay, p 45 questions
B2.2B	Recognize the six most common elements in organic molecules (C, H, N, O, P, S)	1	1	Etxt p27-42, United Streaming, Venn Diagram, essay, p 45 questions
B2.2C	Describe the composition of the four major categories of organic molecules (carbohydrates, lipids, proteins, and nucleic acids)	1	1	Etxt p27-42, United Streaming, Venn Diagram, essay, p 45 questions
B2.2D	Explain the general structure and primary functions of the major complex organic molecules that compose living organisms	1	1	Etxt p27-42, United Streaming, Venn Diagram, essay, p 45 questions

	B2.2E Describe how dehydration and hydrolysis relate to organic molecules	1	1	Etxt p27-42; Gizmos Dehydration Synthesis
B2.2x	Proteins	Unit	Lesson	Resources Used
	B2.2f Explain the role of enzymes and other proteins in biochemical functions (e.g. the protein hemoglobin carries oxygen in some organisms, digestive enzymes, and hormones)	1	1	Etxt p27-42, United Streaming, Venn Diagram, essay, p 45 questions
	B2.2g Propose how moving an organism to a new environment may influence its ability to survive and predict the possible impact of this type of transfer	1	1	Etxt p27-42, United Streaming, Venn Diagram, essay, p 45 questions
B2.3	Maintaining Environmental Stability	Unit	Lesson	Resources Used
	B2.3A Describe how cells function in a narrow range of physical conditions, such as temp. and pH, to perform life functions	2	1	Etxt p 50-66 & 73-88; Cells Alive! website and paragraph; Gizmos: Cell Structure; Concept Definition Map and essay
	B2.3B Describe how the maintenance of a relatively stable internal environment is required for the continuation of life	2	1	extex p 50-66 & 73-88; Cells Alive! website and paragraph; SmartScience - Photosynthesis, Cell Metabolism
	B2.3C Explain how stability is challenged by changing physical, chemical, and environmental conditions as well as the presence of disease agents	2	1	extex p 50-66 & 73-88; Cells Alive! website and paragraph; SmartScience - Photosynthesis, Cell Metabolism
B2.3x	Homeostasis	Unit	Lesson	Resources Used
	B2.3d Identify the general functions of the major systems of the human body (digestion, respiration, reproduction, circulation, excretion, protection from disease, and movement, control and coordination) and describe ways that these systems interact with each other.	3	1	Etxt p 5-9 & 845-864; p 842 exercise; Gizmos; United Streaming video
	B2.3e Describe how human body systems maintain relatively constant internal conditions (temp, acidity, and blood sugar)	3	1	Etxt p 5-9 & 845-864; p 842 exercise; Gizmos; United Streaming video
	B2.3f Explain how human organ systems help maintain human health	3	1	Etxt p 5-9 & 845-864; p 842 exercise; Gizmos; United Streaming video
	B2.3g Compare the structure and function of a human body system or subsystem to a nonliving system (e.g human joints to hinges, enzyme and substrate to interlocking puzzle pieces.	3	1	Etxt p 5-9 & 845-864; p 842 exercise; Gizmos; United Streaming video
B2.4	Cell Specialization	Unit	Lesson	Resources Used
	B2.4A Explain that living things can be classified based on structural, embryological, and molecular (relatedness of DNA sequence) evidence	3	4	Etxt p 177-182 & 305-310; Teachers Domain: All in the Family, The Common Genetic Code, Gene Control, Single-Celled Organisms; essay based on Teachers Domain
	B2.4B Describe how various organisms have developed different specializations to accomplish a particular function and yet the end result is the same	3	4	Etxt p 177-182 & 305-310; Teachers Domain: All in the Family, The Common Genetic Code, Gene Control, Single-Celled Organisms; essay based on Teachers Domain
	B2.4C Explain how different organism accomplish the same result using different structural specializations (gills vs. lungs vs. membranes)	3	4	Etxt p 177-182 & 305-310; Teachers Domain: All in the Family, The Common Genetic Code; essay based on Teachers Domain
	B2.4d Analyze the relationships among organisms based on their shared physical, biochemical, genetic, and cellular characteristics and functional processes	3,4	4,2	Etxt p 305-310 & 433-450; Teachers Domain: All in the Family, The Common Genetic Code, Gene Control, Single-Celled Organisms; essay based on Teachers Domain

B2.4e	Explain how cellular respiration is important for the production of ATP (build on aerobic vs. anaerobic).	2	2	Gizmos: Cell Energy Cycle; etxt pg 93-110; United Streaming Video: Elements of Biology: Matter and Energy
B2.4f	Recognize and describe that both living and nonliving things are composed of compounds, which are themselves made up of elements joined by energy containing bonds such as those in ATP	4	2	Etxt p 336-354; United Steaming video, flow of energy essay
B2.4g	Explain that some structures in the modern eukaryotic cell developed from early prokaryotes, such as mitochondria, and in plants, chloroplasts	3	4	Etxt p 305-310
B2.4h	Describe the structures of viruses and bacteria	4	2	Etxt p 433-450; Teachers Domain: Immune Cells in Action, Microbe Clock and essay; United Streaming: viruses and Bacteria and discussion board posting
B2.4i	Recognize that while viruses lack cellular structure, they have the genetic material to invade living cells.	4	2	Etxt p 433-450; Teachers Domain: Immune Cells in Action, Microbe Clock and essay; United Streaming: viruses and Bacteria and discussion board posting
B2.5	Living Organism Composition	Unit	Lesson	Resources Used
B2.5A	Recognize and explain that macromolecules such as lipids contain high energy bonds	1,3	1,1	Etxt p; 27-42, 5-9 & 845-864; p 842 exercise; Gizmos; United Streaming video; Venn Diagram and essay
B2.5B	Explain how major systems and processes work together in animals and plants, inc. relationships between organelles, cells, tissues, organs, organ systems, and organisms. Relate these to molecular functions	3	1	Etxt p 5-9 & 845-864; p 842 exercise; Gizmos; United Streaming video
B2.5C	Describe how energy is transferred and transformed from Sun to energy-rich molecules during photosynthesis	2	2	Etxt p 93-110; Gizmos; Photsynthesis Lab, Photosynthesis Activity B; Matter and Energy video quiz and discussion board posting
B2.5D	Describe how individual cells break down energy-rich molecules to provide energy for cell functions	2	2	Etxt p 93-110; Teachers Domain: The Powerhouse of the Cell; United Streaming: elements of Biology; Gizmos: Cell Energy Cycle; Matter and Energy video quiz and discussion board posting
B2.5x	Energy Transfer	Unit	Lesson	Resources Used
B2.5e	Explain the interrelated nature of photosynthesis and cellular respiration in terms of ATP synthesis and degradation	2	2	Etxt p 93-110; United Streaming: Elements of Biology; Gizmos: Cell Energy Cycle, Photosynthesis Lab, Photosynthesis Activity B; graphic organizer and essay - plant and animal cells
B2.5f	Related plant structures and functions to the process of photosynthesis and respiration	2	2	Etxt p 93-110; Gizmos; Photsynthesis Lab, Photosynthesis Activity B; Matter; graphic organizer and essay
B2.5g	Compare and contrast plant and animal cells	2	2	Etxt p 93-110; Graphic Organizer and essay - plant and animal cells
B2.5h	Explain the role of cell membranes as a highly selective barrier (diffusion, osmosis, and active transport)	3	1	Etxt p 117-132; Gizmos: Diffusion, Osmosis
B2.5i	Relate cell parts/organelles to their function	2,3	2,1	Etxt p 93-110 & 117-132; Teachers Domain: How Cells Divide; Gizmos: Cell Energy Cycle, Photosynthesis Lab, Photosynthesis Activity B
B2.6x	Internal/External Cell Regulation	Unit	Lesson	Resources Used

B2.6a	Explain that the regulatory and behavioral responses of an organism to external stimuli occur in order to maintain both short and long-term equilibrium	3	1	Etxt p 5-9 & 845-864; p 842 exercise; Gizmos; United Streaming video
B2.r6b	Explain that complex interactions among the different kinds of molecules in the cell cause distinct cycles of activities, such as growth and divisions,. Note that cell behavior can also be affected by molecules from other parts of the organism, such as hormones.(recommended)	4	1	Etxt p 189-200; Etxt assignment p 197
B2.r6c	Recognize and explain that communication and/or interaction are required between cells to coordinate their activities.(recommended)	3	1	Etxt p 5-9 & 845-864; p 842 exercise; Gizmos; United Streaming video
B2.r6d	Explain how higher levels or organization result from specific complex interactions of smaller units and that their maintenance requires a constant input of energy as well as new material. (recommended)	5	1	Etxt p 251-268; Teachers Domain videos and essay
B2.r6e	Analyze the body's response to medical interventions such as organ transplants, medicines, and inoculations. (recommended)	4	2	Etxt p 433-450; Teachers Domain: Immune Cells in Action; essay based on Teachers Domain

Standard B3 INTERDEPENDENCE OF LIVING SYSTEMS AND THE ENVIRONMENT

B3.1	Photosynthesis and Respiration	Unit	Lesson	Resources Used
B3.1A	Describe how organisms acquire energy directly or indirectly from sunlight.	2	2	Etxt p 93-110; United Streaming: Elements of Biology; Gizmos: Cell Energy Cycle, Photosynthesis Lab Photosynthesis Activity B
B3.1B	Illustrate and describe the energy conversions that occur during photosynthesis and respiration.	2	2	Etxt p 93-110; Gizmos: Cell Energy Cycle, Photosynthesis Lab Photosynthesis Activity B
B3.1C	Recognize the equations for photosynthesis and respiration and identify the reactants and products for both	2	2	Etxt p 93-110; United Streaming: Elements of Biology; Gizmos: Cell Energy Cycle, Photosynthesis Lab Photosynthesis Activity B
B3.1D	Explain how living organisms gain and use mass through the processes of photosynthesis and respiration	2	2	Etxt p 93-110; United Streaming: Elements of Biology; Gizmos: Cell Energy Cycle, Photosynthesis Lab Photosynthesis Activity B
B3.1e	Write the chemical equation for photosynthesis and cellular respiration and explain in words what they mean	2	2	Etxt p 93-110; United Streaming: Elements of Biology; Gizmos: Cell Energy Cycle, Photosynthesis Lab Photosynthesis Activity B; graphic organizer and essay
B3.1f	Summarize the process of photosynthesis	2	2	Etxt p 93-110;Gizmos: Cell Energy Cycle, Photosynthesis Lab Photosynthesis Activity B; graphic organizer and essay
B3.2	Ecosystems	Unit	Lesson	Resources Used
B3.2A	Identify how energy is stored in an ecosystem.	4	2	Etxt p 336-354; United Steaming video, flow of energy essay
B3.2B	Describe energy transfer through an ecosystem, accounting for energy lost to the environment as heat.	4	2	Etxt p 336-354; United Steaming video, flow of energy essay
B3.2C	Draw the flow of energy through an ecosystem. Predict changes in the food web when one or more organisms are removed	4	2	Etxt p 336-354; United Steaming video, flow of energy essay
B3.3	Element Recombination	Unit	Lesson	Resources Used
B3.3A	Use a food web to identify and distinguish producers, consumers, and decomposers and explain the transfer of energy through trophic levels.	4	2	Etxt p 336-354; United Steaming video, flow of energy essay
B3.3b	Describe environmental processes (e.g., the carbon and nitrogen cycles) and their role in processing matter crucial for sustaining life.	4	2	Etxt p 336-354; United Steaming video, flow of energy essay

B3.4 Changes in Ecosystems		Unit	Lesson	Resources Used
B3.4A	Describe ecosystem stability. Understand that if a disaster such as flood or fire occurs, the damaged ecosystem is likely to recover in stages of succession that eventually result in a system similar to the original one.	4	3	Ettx p 361-378; Teachers Domain video and essay
B3.4B	Recognize and describe that a great diversity of species increases the chance that at least some living organisms will survive in the face of cataclysmic changes in the environment.	4	3	Ettx p 361-378; Teachers Domain video and essay
B3.4C	Examine the negative impact of human activities.	4	3	Ettx p 361-378; Teachers Domain video and essay
B3.4x Human Impact		Unit	Lesson	Resources Used
B3.4d	Describe the greenhouse effect and list possible causes.	1	2	Ettx p 386-400; Teachers Domain: Snapshot of US Energy Use; article global Warming - Why We Don't Believe It
B3.4d	Describe the greenhouse effect and list possible causes.	4	3	Ettx p 361-378; Teachers Domain video and essay
B3.4e	List the possible causes and consequences of global warming.	1	2	Ettx p 386-400; Teachers Domain: Snapshot of US Energy Use; article global Warming - Why We Don't Believe It
B3.4e	List the possible causes and consequences of global warming.	4	3	Ettx p 361-378; Teachers Domain video and essay
B3.5 Populations		Unit	Lesson	Resources Used
B3.5A	Graph changes in population growth, given a data table	4	1	Ettx p 319-332 p 332 sec 2 review; Gizmos
B3.5B	Explain the influences that affect population growth.	4	1	Ettx p 319-332 p 332 sec 2 review; Gizmos
B3.5C	Predict the consequences of an invading organism on the survival of other organisms	4	1	Ettx p 319-332 p 332 sec 2 review; Gizmos
B3.5x Environmental Factors		Unit	Lesson	Resources Used
B3.5d	Describe different reproductive strategies employed by various organisms and explain their advantages and disadvantages.	4	3	Ettx p 361-378; Teachers Domain video and essay
B3.5e	Recognize that and describe how the physical or chemical environment may influence the rate, extent, and nature of population dynamics within ecosystems.	4	3	Ettx p 361-378; Teachers Domain video and essay
B3.5f	Graph an example of exponential growth. Then show the population leveling off at the carrying capacity of the environment.	4	3	Ettx p 361-378; Teachers Domain video and essay
B3.r5g	Diagram and describe the stages of the life cycle for a human disease-causing organism. (recommended)	5	1	Ettx p 251-268; Teachers Domain videos and essay
Standard B4 GENETICS				
B4.1 Genetics and Inherited Traits		Unit	Lesson	Resources Used
B4.1A	Draw and label a homologous chromosome pair with heterozygous alleles highlighting a particular gene location	2	3	Ettx p 117-124 & 124-132, question p 135; United Streaming video; Gizmos
B4.1B	Explain that the information passed from parents to offspring is transmitted by means of genes that are coded in DNA molecules. These genes contain the information for the production of proteins	2	3	Ettx p 117-124 & 124-132, question p 135; United Streaming video; Gizmos
B4.1c	Differentiate between dominant, recessive, codominant, polygenic, and sex-linked traits	2	3	Ettx p 117-124 & 124-132, question p 135; United Streaming video; Gizmos
B4.1c	Differentiate between dominate, recessive, co-dominant, polygenic, and sex-linked traits.	3	3	Ettx p 161-176; Ettx Punnett Square Activity, Ettx Data Lab

	B4.1d	Explain the genetic basis for Mendel's laws of segregation and independent assortment	2	3	United Streaming: Elements of Biology: Genetics: The Molecular Basis of Heredity; etxt pg 177-182 & 305-310
	B4.1d	Explain the genetic basis for Mendel's laws of segregation and independent assortment	3	3	Etxt p 161-176; Etxt Punnett Square Activity, Etxt Data Lab, Venn Diagram and essay - Mitosis and Meiosis
	B4.1e	Determine the genotype and phenotype of monohybrid crosses using a Punnett Square.	2	3	Etxt p 117-124 & 124-132, question p 135; United Streaming video; Gizmos
	B4.1e	Determine the genotype and phenotype of monohybrid crosses using a Punnett Square.	3	3	Etxt p 161-176; Etxt Punnett Square Activity
B4.2	DNA		Unit	Lesson	Resources Used
	B4.2A	Show that when mutations occur in sex cells, they can be passed on to offspring (inherited mutations), but if they occur in other cells, they can be passed on to descendant cells only (noninherited mutations).	2	1,3	Etxt p 207-220, 117-124 & 124-132, question p 135; United Streaming video; Gizmos
	B4.2B	Recognize that every species has its own characteristic DNA sequence.	2	1,3	Etxt p 207-220, 117-124 & 124-132, question p 135; United Streaming video; Gizmos
	B4.2C	Describe the structure and function of DNA.	2	1,3	Etxt p 207-220, 117-124 & 124-132, question p 135; United Streaming video; Gizmos
	B4.2D	Predict the consequences that changes in the DNA composition of particular genes may have on an organism (e.g., sickle cell anemia, other).	2	1	Etxt 207-220; United Streaming video; Gizmos
	B4.2E	Propose possible effects (on the genes) of exposing an organism to radiation and toxic chemicals	2	1,3	Etxt p 207-220, 117-124 & 124-132, question p 135; United Streaming video; Gizmos
B4.2x	DNA, RNA, and Protein Synthesis		Unit	Lesson	Resources Used
	B4.2f	Demonstrate how the genetic information in DNA molecules provides instructions for assembling	2	1	Etxt 207-220; United Streaming video; Gizmos
	B4.2g	Describe the processes of replication, transcription, and translation and how they relate to each other in molecular biology	4	1	Etxt p 189-200; United Streaming: Viruses and Bacteria and discussion board posting; Etxt assignment p 197
	B4.2g	Describe the processes of replication, transcription, and translation and how they relate to each other in molecular biology	2	1	Etxt 207-220; United Streaming video; Gizmos
	B4.2h	Recognize that genetic engineering techniques provide great potential and responsibilities	2	1	Etxt 207-220; United Streaming video; Gizmos
	B4.2i	Explain how recombinant DNA technology allows scientists to analyze the structure and function of genes. (recommended)	2	1	Etxt 207-220; United Streaming video; Gizmos
B4.3	Cell Division - Mitosis and Meiosis		Unit	Lesson	Resources Used
	B4.3A	Compare and contrast the processes of cell division (mitosis and meiosis), particularly as those processes relate to production of new cells and to passing on genetic information between generations.	3,3	1,3	Etxt p 117-132 & 161-176; Teachers Domain: How Cells Divide; Gizmos: Cell Division; Venn Diagram and essay - Mitosis and Meiosis
	B4.3B	Explain why only mutations occurring in gametes (sex cells) can be passed on to offspring.	2, 4	3, 1	Etxt pg 117-132 & 319-332, Gizmos: Human Karyotyping; Mutation and Natural Selection; United Streaming Video: Elements of biology: Genetics: The Molecular Basis of Heredity
	B4.3C	Explain how it might be possible to identify genetic defects from a karyotype of a few cells.	2	3	Gizmos: Human Karyotyping; United Streaming Video: Elements of Biology: Genetics: The Molecular Basis of Life
	B4.3d	Explain that the sorting and recombination of genes in sexual reproduction result in a great variety of possible gene combinations from the offspring of two parents.	2	3	Gizmos: Human Karyotyping; United Streaming Video: Elements of Biology: Genetics: The Molecular Basis of Life

B4.3e	Recognize that genetic variation can occur from such processes as crossing over, jumping genes, and deletion and duplication of genes.	2	3	Gizmos: Human Karyotyping; United Streaming Video: Elements of Biology: Genetics: The Molecular Basis of Life
B4.3f	Predict how mutations may be transferred to progeny.	3	4	etxt pg 177-182 & 305-310; Teachers Domain: Gene Control
B4.3g	Explain that cellular differentiation results from gene expression and/or environmental influence (e.g., metamorphosis, nutrition).	3	4	etxt pg 177-182 & 305-310; Teachers Domain: Gene Control

B4.4x	Genetic Variation	Unit	Lesson	Resources Used
B4.4a	Describe how inserting, deleting, or substituting DNA segments can alter a gene. Recognize that an altered gene may be passed on to every cell that develops from it and that the resulting features may help, harm, or have little or no effect on the offspring's success in its environment.	2	2	Ettx p 227-242; United Streaming videos and essay; Gizmos
B4.4b	Explain that gene mutation in a cell can result in uncontrolled cell division called cancer. Also know that exposure of cells to certain chemicals and radiation increases mutations and thus increases the chance of cancer.	2	2	Ettx p 227-242; United Streaming videos and essay; Gizmos
B4.4c	Explain how mutations in the DNA sequence of a gene may be silent or result in phenotypic change in an organism and in its offspring.	2	2	Ettx p 227-242; United Streaming videos and essay; Gizmos
B4.r5x	Recombinant DNA	Unit	Lesson	Resources Used
B4.r5a	Explain how recombinant DNA technology allows scientists to analyze the structure and function of genes. (recommended)	2	2	Ettx p 227-242; United Streaming videos and essay; Gizmos
B4.r5b	Evaluate the advantages and disadvantages of human manipulation of DNA. (recommended)	2	2	Ettx p 227-242; United Streaming videos and essay; Gizmos

Standard B5 EVOLUTION AND BIODIVERSITY				
B5.1	Theory of Evolution	Unit	Lesson	Resources Used
B5.1A	Summarize the major concepts of natural selection (differential survival and reproduction of chance inherited variants, depending on environmental conditions).	5	1	Ettx p 251-268; Teachers Domain videos and essay
B5.1B	Describe how natural selection provides a mechanism for evolution.	5	1	Ettx p 251-268; Teachers Domain videos and essay
B5.1c	Summarize the relationships between present-day organisms and those that inhabited the Earth in the past (e.g., use fossil record, embryonic stages, homologous structures, chemical basis)	5	1	Ettx p 251-268; Teachers Domain videos and essay
B5.1d	Explain how a new species or variety originates through the evolutionary process of natural selection.	5	1	Ettx p 251-268; Teachers Domain videos and essay
B5.1e	Explain how natural selection leads to organisms that are well suited for the environment (differential survival and reproduction of chance inherited variants, depending upon environmental conditions).	5	1	Ettx p 251-268; Teachers Domain videos and essay
B5.1f	Explain, using examples, how the fossil record, comparative anatomy, and other evidence supports the theory of evolution.	5	1	Ettx p 251-268; Teachers Domain videos and essay
B5.1g	Illustrate how genetic variation is preserved or eliminated from a population through natural selection (evolution) resulting in biodiversity.	5	1	Ettx p 251-268; Teachers Domain videos and essay
B5.2x	Molecular Evidence	Unit	Lesson	Resources Used
B5.2a	Describe species as reproductively distinct groups of organisms that can be classified based on morphological, behavioral, and molecular similarities	5	1	Ettx p 251-268; Teachers Domain videos and essay
B5.2b	Explain that the degree of kinship between organisms or species can be estimated from the similarity of their DNA and protein sequences	5	1	Ettx p 251-268; Teachers Domain videos and essay

B5.2c	Trace the relationship between environmental changes and changes in the gene pool, such as genetic drift and isolation of subpopulations.	5	1	Etxt p 251-268; Teachers Domain videos and essay
B5.r2d	Interpret a cladogram or phylogenetic tree showing evolutionary relationships among organisms (recommended)	4	2	Etxt p 305-310; Teachers Domain: All in the Family, The Common Genetic Code; essay based on Teachers Domain
B5.3	Natural Selection	Unit	Lesson	Resources Used
B5.3A	Explain how natural selection acts on individuals, but it is populations that evolve. Relate genetic mutations and genetic variety produced by sexual reproduction to diversity within a given population	5	2	Etxt p 275-292; Gizmos; gpahic organizer and essay; p 292 math lab
B5.3B	Describe the role of geographic isolation in speciation	5	2	Etxt p 275-292; Gizmos; gpahic organizer and essay; p 292 math lab
B4.3C	Give examples of ways in which genetic variation and environmental factors are causes of evolution and the diversity of organisms	5	2	Etxt p 275-292; Gizmos; gpahic organizer and essay; p 292 math lab
B5.3d	Explain how evolution through natural selection can result in changes in biodiversity	5	2	Etxt p 275-292; Gizmos; gpahic organizer and essay; p 292 math lab
B5.3e	Explain how changes at the gene level are the foundation for changes in populations and eventually the formation of new species	4	2	Etxt p 336-354; United Steaming video, flow of energy essay
B5.3f	Demonstrate and explain how biotechnology can improve a population and species.	4	2	Etxt p 336-354; United Steaming video, flow of energy essay