

Biology Curriculum Map and Pacing Guide (2025 - 2026)

Unit 1: Energy - Ecosystems: Interactions, Energy, and Dynamics

Duration: **7 days (Fall)** and **7 days (Spring)**

Topic(s)	Required Labs Labs/Activities	Savvas Materials	Tennessee Biology Academic Standards (DCIs)	Formative Writing Assessment SAS (Scientific Analysis Statement) #1
Energy Transfer Relationships Disruptions	Energy Transfer Lab	Interactivity: Symbiotic Relationships Interactivity: Limiting Factors	BIO1.LS1: From Molecules to Organisms: Structures and Processes BIO1.LS1.2 Plan and construct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	End of Unit Summative Assessment Common Assessment (30-35 question test via MasteryConnect)
Population Dynamics Carrying Capacity (DI and DD)	Population Dynamics (Carrying Capacity) Lab	Beyond Labz - Predator Competition Ecology Interactivity: The Great Acceleration	BIO1.LS2: Ecosystems: Interactions, Energy, and Dynamics BIO1.LS.2.1 - Use mathematical and/or computational representations to support explanations of factors that affect the carrying capacity of ecosystems at different scales.	
Ecological Succession	Succession Lab	Interactivity: Human Impact on Ecosystems Interactivity: Identifying impact of climate change	BIO1.LS.2.2 - Create, or use, a mathematical model to describe the transfer of energy from one trophic level to another. Explain how the efficiency of energy transfer between trophic levels affects the relative number of organisms that can be supported at each trophic level and necessitates a constant input of energy from sunlight and inorganic compounds from the environment.	
Carbon Cycle Environmental Feedback loops (positive & negative)	Carbon Cycle Lab		BIO1.LS.2.3 - Obtain, evaluate, and communicate information based on evidence to describe how the impact of varying levels of disturbance is related to the resilience of an ecosystem.	
Extinction Human Impact on Biodiversity			BIO1.LS.2.4 - Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. BIO1.LS2.5 - Analyze data about the role of group behavior on individual and species' chances to survive and reproduce.	

Unit 2: Anabolism of Carbohydrates

Duration: **8 days (Fall)** and **7 days (Spring)**

Organelles: chloroplast, cell wall, cell membrane

Topic(s)	Required Labs Labs/Activities	Savvas Materials	Tennessee Biology Academic Standards (DCIs)	Formative Writing Assessment SAS (Scientific Analysis Statement) - none End of Unit Summative Assessment Common Assessment (30-35 question <u>test</u> via MasteryConnect)
Anabolic / Potential energy Organic vs Inorganic Molecules Carbohydrates and Lipids: Monomer → Polymer, structure, and functions	Building Carbohydrates	Interactivity: Understanding macromolecules	BIO1.LS1: From Molecules to Organisms: Structures and Processes BIO1.LS1.2 Plan and construct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	
Photosynthesis Chemosynthesis ATP	Photosynthesis Lab	Interactivity: A model of Photosynthesis - Chloroplast and LD/LI overview	BIO1.LS.1.4 - Create, or use, a model to describe how the process of photosynthesis converts light energy into the stored chemical energy of bonds created by converting CO ₂ and H ₂ O into sugar and other organic molecules.	
Osmosis Simple diffusion (gas exchange) Plant parts (stomata, xylem & phloem) Transpiration Water Structure and Bonds Capillary Action	Osmosis Lab Water Properties Lab	Explain video: Osmosis and Interactivity: Osmosis	BIO1.LS1.5 - Construct an explanation based on evidence that matter taken into an organism can be broken down and recombined to make macromolecules necessary for life functions. BIO1.LS.2.2 - Create, or use, a mathematical model to describe the transfer of energy from one trophic level to another. Explain how the efficiency of energy transfer between trophic levels affects the relative number of organisms that can be supported at each trophic level and necessitates a constant input of energy from sunlight and inorganic compounds from the environment.	

Unit 3: Catabolism of Carbohydrates

Duration: **7 days (Fall)** and **7 days (Spring)**

Organelles: mitochondria

Topic(s)	Required Labs Labs/Activities	Savvas Materials	Tennessee Biology Academic Standards (DCIs)	Formative Writing Assessment SAS (Scientific Analysis Statement) #2
pH and enzymes allosteric regulation activation energy	ph Lab enzyme Lab	Interactivity: Functioning of Enzymes Interactivity: Cellular Respiration Interactivity: The mechanics of cellular respiration	BIO1.LS1: From Molecules to Organisms: Structures and Processes BIO1.LS1.2 Plan and construct an investigation to provide evidence that feedback mechanisms maintain homeostasis. BIO1.LS1.5 - Construct an explanation based on evidence that matter taken into an organism can be broken down and recombined to make macromolecules necessary for life functions. BIO1.LS.1.6 - Create, or use, a model to describe how cellular respiration transforms the stored chemical energy of food, resulting in a net transfer of energy. Compare aerobic respiration to alternative processes of glucose metabolism.	End of Unit Summative Assessment Common Assessment (40-45 question <u>cumulative benchmark</u> (units 1-3) via MasteryConnect)
polymer → monomer catabolic potential energy cellular respiration ETC chemiosmosis active transport fermentation	anaerobic respiration lab aerobic respiration lab			OMGs! - Specific Examples from Standards Reference Guide

Unit 4: Nucleic Acids and the Regulation of the Cell Cycle

Duration: **7 days (Fall)** and **7 days (Spring)**

Organelles: centriole, cytoskeleton, nucleus

Topic(s)	Required Labs Labs/Activities	Savvas Materials	Tennessee Biology Academic Standards (DCIs)	Formative Writing Assessment SAS (Scientific Analysis Statement) - none
Chromosome Structure Gene location		Interactivity: DNA structure Interactivity: Exploring mitosis	BIO1.LS1: From Molecules to Organisms: Structures and Processes BIO1.LS1.5 - Construct an explanation based on evidence that matter taken into an organism can be broken down and recombined to make macromolecules necessary for life functions. BIO1.LS3: Heredity: Inheritance and Variation of Traits BIO1.LS3.1 - Engage in an argument from evidence that the process of cellular division (mitosis) creates diploid daughter cells that are genetically identical to the diploid parent cells. BIO1.LS3.4 - Construct an explanation based on evidence that genetic variations may result from (a) new genetic combinations via the processes of crossing over and random segregation of chromosomes during meiosis, (b) mutations that occur during replication, and/or (c) mutations caused by environmental factors. Evidence should include that the mutations that occur in gametes can be passed to offspring.	End of Unit Summative Assessment Common Assessment (40 question <u>test</u> via MasteryConnect)
Mitotic Cell Cycle Varying Rates of Mitotic Division Cellular Regulation				
DNA: Structure and Function Chargaff's Rule				
DNA Replication				

Unit 5: Gene Expression

Duration: **7 days (Fall)** and **7 days (Spring)**

Organelles: ER and ribosomes

Topic(s)	Required Labs Labs/Activities	Savvas Materials	Tennessee Biology Academic Standards (DCIs)	Formative Writing Assessment SAS (Scientific Analysis Statement) #3
Parts of a gene Operons		Interactivity: Gene regulation	BIO1.LS1: From Molecules to Organisms: Structures and Processes BIO1LS1.1 - Construct an explanation based on evidence that the essential functions of life are primarily carried out through the work of proteins that are coded for by genes in DNA, as described by the Central Dogma (transcription, translation) BIO1.LS1.5 - Construct an explanation based on evidence that matter taken into an organism can be broken down and recombined to make macromolecules necessary for life functions. BIO1.LS3: Heredity: Inheritance and Variation of Traits BIO1LS3.3 - Ask questions to clarify that variation of traits arises from differences in genes (alleles) and how cells regulate gene expression. BIO1LS3.4 - Construct an explanation based on evidence that genetic variations may result from (a) new genetic combinations via the processes of crossing over and random segregation of chromosomes during meiosis, (b) mutations that occur during replication, and/or (c) mutations caused by environmental factors. Evidence should include that the mutations that occur in gametes can be passed to offspring.	End of Unit Summative Assessment Common Assessment (40 question test via MasteryConnect)
Environmental factors (Lac/Trp) Transcription factors				
Transcription and Translation	Cookie Lab			
Alternative Splicing				

Unit 6: Proteins and Cell Transport

Duration: **7 days (Fall)** and **7 days (Spring)**

Organelles: nucleolus, golgi, and ribosomes

Topic(s)	Required Labs Labs/Activities	Savvas Materials	Tennessee Biology Academic Standards (DCIs)	Formative Writing Assessment SAS (Scientific Analysis Statement) - none
Protein Structure and Shape			BIO1.LS1: From Molecules to Organisms: Structures and Processes BIO1LS1.1 - Construct an explanation based on evidence that the essential functions of life are primarily carried out through the work of proteins that are coded for by genes in DNA, as described by the Central Dogma (transcription, translation)	End of Unit Summative Assessment Common Assessment (40 question <u>test</u> via MasteryConnect) MasteryConnect Checkpoint (units 1-6)
Endomembrane and Protein Functions			BIO1.LS1.5 - Construct an explanation based on evidence that matter taken into an organism can be broken down and recombined to make macromolecules necessary for life functions. BIO1.LS1.7 Construct an explanation from evidence to explain how the integrated functions of the brain in complex animals result in the successful interpretation of input and generation of behaviors in response to those inputs.	
Diffusion Facilitated diffusion Permeability Active Transport			BIO1.LS3: Heredity: Inheritance and Variation of Traits BIO1LS3.3 - Ask questions to clarify that variation of traits arises from differences in genes (alleles) and how cells regulate gene expression. BIO1LS3.4 - Construct an explanation based on evidence that genetic variations may result from (a) new genetic combinations via the processes of crossing over and random segregation of chromosomes during meiosis, (b) mutations that occur during replication, and/or (c) mutations caused by environmental factors. Evidence should include that the mutations that occur in gametes can be passed to offspring.	

Unit 7: Cell Specialization, Feedback, and the Brain

Duration: **10 days (Fall)** and **8 days (Spring)**

Topic(s)	Required Labs Labs/Activities	Savvas Materials	Tennessee Biology Academic Standards (DCIs)	Formative Writing Assessment SAS (Scientific Analysis Statement) #4
cell specialization			BIO1.LS1: From Molecules to Organisms: Structures and Processes BIO1.LS1.2 Plan and construct an investigation to provide evidence that feedback mechanisms maintain homeostasis. BIO1.LS1.3 Use a model to describe how differentiation in a multicellular organism creates specialized cells that perform diverse functions to work together to meet the needs of the entire organism, including human development. BIO1.LS1.7 Construct an explanation from evidence to explain how the integrated functions of the brain in complex animals result in the successful interpretation of input and generation of behaviors in response to those inputs.	End of Unit Summative Assessment Common Assessment (40 question test via MasteryConnect)
feedback loops (positive and negative)				
brain				

Unit 8: Reproduction and Non-Mendelian Genetics

Duration: **11 days (Fall)** and **8 days (Spring)**

Topic(s)	Required Labs Labs/Activities	Savvas Materials	Tennessee Biology Academic Standards (DCIs)	Formative Writing Assessment SAS (Scientific Analysis Statement) #5
Meiotic Cell Cycle Fertilization Law of Independent Assortment Law of Segregation Non-disjunction			BIO1.LS3: Heredity: Inheritance and Variation of Traits BIO1.LS3.2 - Engage in an argument from evidence that the process of meiosis exists to create genetic variation in a population from the creation of new combinations of genetic material in each of the haploid gametes. BIO1.LS3.4 - Construct an explanation based on evidence that genetic variations may result from (a) new genetic combinations via the processes of crossing over and random segregation of chromosomes during meiosis, (b) mutations that occur during replication, and/or (c) mutations caused by environmental factors. Evidence should include that the mutations that occur in gametes can be passed to offspring.	End of Unit Summative Assessment Common Assessment (45-50 question <u>cumulative benchmark</u> (units 4-8) via MasteryConnect)
Interpreting genetic problems Non-mendelian Linked genes	Puppy Lab / Gel Electrophoresis Lab			
Chromosome Mutations				

Unit 9: Biological Change: Unity and Diversity

Duration: **14 days (Fall)** and **7 days (Spring)**

Topic(s)	Required Labs Labs/Activities	Savvas Materials	Tennessee Biology Academic Standards (DCIs)	Assessments
History of Biological Change Hardy Weinberg			BIO1.LS4: Biological Change: Unity and Diversity BIO1.LS4.1 - Analyze and interpret scientific data that common ancestry and biological evolution are supported by multiple lines of empirical evidence (e.g. DNA sequences, amino acid sequences, anatomical structures, the fossil record, biogeography, or order of appearance of structures during embryological development). BIO1.LS4.2 - Apply concepts of statistics (i.e. probability) to support explanations that organisms in a population with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait BIO1.LS4.3 - Analyze and interpret data that natural selection is influenced by (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment. BIO1.LS4.4 - Construct an explanation based on evidence for how natural selection leads to adaptation in populations. BIO1.LS4.5 - Obtain, evaluate, and communicate information about how changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species BIO1.LS2.5 - Analyze data about the role of group behavior on individual and species' chances to survive and reproduce.	Formative Writing Assessment SAS (Scientific Analysis Statement) #9 End of Unit Summative Assessment Common Assessment (45-50 question <u>test</u> via MasteryConnect)
Scientific Evidence of Biological Change				
Causative Agents of Allele Frequency Changes	Allele Frequency Lab			
Molecular Relatedness				
Speciation Cladograms Classification Behavior				