



MHS Science Curriculum & Pacing Guide



BIOLOGY

	Marking Period 1		Marking Period 2
Semester 1	Unit: 1. From Molecules to Organisms Unit: 2. Structure and Function		Unit: 2. Structure and Function Unit: 3. Inheritance and Variation of Traits
	Marking Period 3		Marking Period 4
Semester 2	Unit 4. Natural Selection and Evolution		Unit 5. Interdependent Relationships in Ecosystems



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Content Area: Biology		Grade Level: 10	
Title of Unit: From Molecules to Organisms		Number of Weeks/Days: 6-8 weeks	
Standards:		Assessment:	Resources:
1-5 Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.		Summative: NorthEd Common Assessment: Matter and Energy in Organisms and Ecosystems Otus Checkpoint Quizzes	Teacher created and aligned materials, including laboratory activities.
1-6 Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.			
1-7 Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed, resulting in a net transfer of energy.			
2-3 Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.			
2-5 Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.			
2-4 Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.			



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Content Area: Biology		Grade Level: 10	
Title of Unit: Structure and Function		Number of Weeks/Days: 4-6 weeks	
Standards:	Assessment:	Resources:	
1-3 Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	Summative: NorthEd Common Assessment: Structure and Function Otus Checkpoint Quizzes	Teacher created and aligned materials, including laboratory activities.	
1-2 Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.			
1-1 Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.			



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Content Area: Biology		Grade Level: 10	
Title of Unit: Inheritance and Variation of Traits		Number of Weeks/Days: 6-8 weeks	
Standards:		Assessment:	Resources:
1-4 Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.		Summative: NorthEd Common Assessment: Inheritance and Variation of Traits Otus Checkpoint Quizzes	Teacher created and aligned materials, including laboratory activities.
3-1 Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.			
3-3 Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.			
3-2 Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.			



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Content Area: Biology		Grade Level: 10	
Title of Unit: Natural Selection and Evolution		Number of Weeks/Days: 8 weeks	
Standards:		Assessment:	Resources:
4-3 Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.		Summative: NorthEd Common Assessment: Natural Selection and Evolution Otus Checkpoint Quizzes	Teacher created and aligned materials, including laboratory activities.
4-2 Construct an explanation based on evidence that the process of evolution primarily results from four factors: (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 .			
4-4 Construct an explanation based on evidence for how natural selection leads to adaptation of populations.			
4-5 Evaluate the evidence supporting claims that 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.			
4-1 Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.			



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Content Area: Biology		Grade Level: 10	
Title of Unit: Interdependent Relationships in Ecosystems		Number of Weeks/Days: 6-8 weeks	
Standards:		Assessment:	Resources:
HS-LS2-8. Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.		Summative: NorthEd Common Assessment: Relationships in Ecosystems Otus Checkpoint Quizzes	Teacher created and aligned materials, including laboratory activities.
2-2 Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.			
2-1 Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.			
2-6 Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.			
2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.*			



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