

The Bryan Allen Stevenson School of Excellence
Section 3 - Attachment 4.4: Science MOA Acknowledgement

The Bryan Allen Stevenson School of Excellence fully intends to join the Science Coalition.

In Year 0 and upon approval of this charter application, The Board of the Bryan Allen Stevenson School of Excellence and school leadership team will sign the Memorandum of Agreement to join the Science Coalition and pay the necessary fees.

Please see how we plan to address the NGSS in high school below.

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Science Scope and Sequence with respect to the NGSS High School Overview:

Physical Science 9th Grade	Life Science 10th Grade (Full sequence provided within the Science Coalition framework)	Earth and Space Sciences 11th/12th Grade
<p>Matter and its Interactions</p> <p>HS.PS: How can one explain the structure and properties of matter? HS.ESS: How do people reconstruct and date events in Earth's Planetary history? HS.ESS: How do people reconstruct and date events in Earth's Planetary history?</p>	<p>From Molecules to Organisms: Structures and Processes</p> <p>HS-LS1-1: Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells. HS-LS1-2: Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. HS-LS1-3: Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis. HS-LS1-4: Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complexing organisms. HS-LS1-5: Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy. HS-LS1-6: 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. HS-LS1-7: 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 the new compounds are formed resulting in a net transfer of energy. HS-LS2-1: Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. HS-LS2-2: Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.</p>	<p>Earth's Place in the Universe</p> <p>HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. HS-ESS3-2: Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios. HS-ESS3-3: Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity. HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural environments. HS-ESS3-5: Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems. HS-ESS3-6: Use a computational representation to illustrate the relationships among Earth Systems and how those relationships are being modified due to human activity. HS-ESS1-1: Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy in the form of radiation. HS-ESS1-4: Use mathematical or computational representations to predict the motion of orbiting objects in the solar system. ****PS4-2: Evaluate questions about the advantages of using digital transmission and storage of information ****LS2-8: Evaluate evidence for the role of group</p>

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		behavior on individual and species' chances to survive and reproduce.
<p>Motion and Stability: Forces and Interactions</p> <p>HS.PS: How do substances combine or change to make new substances? How does one characterize and explain these reactions and make predictions about them?</p> <p>HS.ESS: How do people reconstruct and date events in Earth's Planetary history?</p>	<p>Ecosystems: Interactions, Energy, and Dynamics</p> <p>HS-LS2-3: Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.</p> <p>HS-LS2-4: Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.</p> <p>HS-LS2-5: Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.</p> <p>HS-LS2-6: 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.</p> <p>HS-LS2-7: Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.</p> <p>HS-LS2-8: Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.</p> <p>HS-ESS2-6: Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.</p> <p>HS-ESS2-7: Construct an argument based on evidence about the simultaneous co-evolution of Earth's systems and life on Earth.</p>	<p>Earth's Systems</p> <p>HS-PS1-6: Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.</p> <p>HS-PS1-5: Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.</p> <p>HS-PS3-1: Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known. (A,i,ii,iii,iv-revisit from 9th) (2A,B; 3A, B)*</p> <p>HS-PS2-1: Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.</p> <p>HS-PS2-2: Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.</p> <p>HS-PS2-4: Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects.</p> <p>HS-PS2-6: Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials</p> <p>HS-PS4-3: Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.</p> <p>HS-PS4-4: Evaluate the validity and</p>

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		<p>reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.</p> <p>HS-PS4-5: Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.</p> <p>PS1-4: Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends on the changes in total bond energy.</p> <p>PS1-8: Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.</p>
<p>Energy</p> <p>HS.PS: How is energy transferred and conserved? How are waves used to transferred energy and send and store information? HS.ESS: How do people reconstruct and date events in Earth's Planetary history?</p>	<p>Heredity: Inheritance and Variation of Traits</p> <p>HS-LS3-1: Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.</p> <p>HS-LS3-2: 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.</p> <p>HS-LS3-3: Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.</p> <p>HS-LS4-1: Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.</p> <p>HS-LS4-2: Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase the 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</p>	<p>Earth and Human Activity</p> <p>HS-ETS1-1: analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.</p> <p>HS-ETS1-2: Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.</p> <p>HS-ETS1-3: Evaluate a solution to a complex real-world problem based on prioritized criteria and tradeoffs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.</p>

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	<p>survive and reproduce in the environment. HS-LS4-3: 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. HS-LS4-4: Construct an explanation based on evidence for how natural selection leads to adaptation of populations. HSLS4-6: Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity. HS-LS4-5: 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. HS-PS1-4 Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy. (Ai, Aii, Aiii)* HS-PS1-7: Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.(need to look at evidence statements closer) HS-PS3-1: Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.</p>	
<p>Waves and their Applications in Technologies for Information Transfer</p> <p>HS-ETS1-1: analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. HS-ETS1-2: Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. HS-ETS1-3: Evaluate a solution to a complex real-world problem based</p>	<p>Biological Evolution: Unity and Diversity</p> <p>HS-ETS1-1: analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. HS-ETS1-2: Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. HS-ETS1-3: Evaluate a solution to a complex real-world problem based on prioritized criteria and tradeoffs that account for a range of constraints,</p>	

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