

Grade 8 Curriculum Map
Instructional Plan for Science Grade 8
Robert J. Buss
St. Paul's Lutheran School
Written: June 2020

Grade 8 Curriculum
Instructional Plan for Science 8 (Final Year of HMH Fusion)
Submitted by Robert J. Buss
July 2021

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	Content Type	Objectives	Standards	Assessment	Materials
A U G U S T & S E P T E M B E R	<ul style="list-style-type: none"> 24 FOSS Module: Chemical Interactions Investigation 1: Mystery mixture Mixing Substances Investigation 2: Periodic Table Elements of the World Investigation 3: GasExpansion/Con traction Liquid Expansion/Contra ction Solid Expansion/Contra ction	<ul style="list-style-type: none"> Cells and Their Role in All Life Characteristics of Cells Chemistry of Cells Cell Structures and Functions Levels of Cellular Organization Homeostasis and Cell Processes Cellular Engineering and Bio ethical questions Photosynthesis and Cellular Respiration 	<ul style="list-style-type: none"> LS1.A: Structure and Function State Standard for General Education: MS-LS1-3: Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. Essential Element: EE.MS-LS1-3 <ul style="list-style-type: none"> Target Level: Make a claim about how a structure (e.g., organs and organ systems) and its related function supports survival of animals (circulatory, digestive, and respiratory systems). Precursor Level: Use a model to demonstrate how organs are connected in major organ systems. Initial Level: Recognize major organs of animals. LS1: From Molecules to Organisms LS1.B: Growth and Development of Organisms State Standard for General Education: MS-LS1-5: Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. <ul style="list-style-type: none"> Essential Element: EE.MS-LS1-5 Target Level: Interpret data to show that environmental resources (e.g., food, light, space, water) influence growth of organisms (e.g., drought decreasing plant growth, fertilizer increasing plant growth, different varieties of plant seeds growing at different rates in different conditions, fish growing larger in large ponds than small ponds). Precursor Level: Identify factors that influence growth of organisms. Initial Level: Match organisms to their habitats. 	<ul style="list-style-type: none"> Daily homework Weekly quizzes “muddiest point” formative interview assessment Lab reports (3) Chapter tests (2) 	HMH Fusion Science Module A: Cells and Heredity Unit 1 Discovering God's Creation - Martin Luther College (Boehlke/Klockziem)
O C T O B E R	<ul style="list-style-type: none"> 20 FOSS Module: Chemical Interactions Investigations 4 and 5 Mixing Hot and Cold	Reproduction and Heredity <ul style="list-style-type: none"> Mitosis Meiosis <ul style="list-style-type: none"> Students will learn to use a microscope, collect various plant and animal cells and observe, record, sketch, and compare/contrast cells 	<ul style="list-style-type: none"> SCI.LS1.A.m All living things are made up of cells. In organisms, cells work together to form tissues and organs that are specialized for particular body functions. SCI.LS3.B.m In sexual reproduction, each parent contributes half of the genes acquired by the offspring resulting in variation between parent and offspring. Genetic information can be altered because of mutations, which may result in beneficial, negative, or no change to proteins in or traits of an organism. 	<ul style="list-style-type: none"> Daily homework Weekly quizzes “muddiest point” formative interview assessment Lab reports (3) Chapter tests (2) 	HMH Fusion Science Module A: Cells and Heredity Unit 2

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Particle Collisions Heat				
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N O V E M B E R		<p>Students observe, compare, categorize, and care for a selection of organisms, and in so doing they learn to identify properties of plants and animals and to sort and group organisms on the basis of observable properties.</p> <ul style="list-style-type: none"> • Students investigate structures of the organisms and learn how some of the structures function in growth and survival. • Develop an attitude of respect for life. • Gain experience with organisms, both plants and animals. • Observe and compare properties of seeds and fruits. • Investigate the effect of water on seeds. • Observe, describe, and record properties of germinated seeds. • Compare different kinds of germinated seeds. • Grow plants hydroponically and observe the life cycle of a bean plant. 	<ul style="list-style-type: none"> • SCI.CC6.m Students model complex and microscopic structures and systems and visualize how their function depends on the shapes, composition, and relationships among their parts. They analyze many complex natural and designed structures and systems to determine how they function. They design structures to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used. • SCI.SEP6.A.m Students construct explanations supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. This includes the following: Construct an explanation that includes qualitative or quantitative relationships between variables that predict and describe phenomena. • SCI.LS1.C.m Plants use the energy from light to make sugars through photosynthesis. Within individual organisms, food is broken down through a series of chemical reactions that rearrange molecules and release energy. • SCI.LS2.A.m Organisms and populations are dependent on their environmental interactions both with other living things and with nonliving factors, any of which can limit their growth. Competitive, predatory, and mutually beneficial interactions vary across ecosystems but the patterns are shared. • SCI.LS3.A.m Genes chiefly regulate a specific protein, which affect an individual's traits. • SCI.PS3.D.m Sunlight is captured by plants and used in a chemical reaction to produce sugar molecules for storing this energy. This stored energy can be released by respiration or combustion, which can be reversed by burning those molecules to release energy. 	<ul style="list-style-type: none"> • Daily homework • Weekly quizzes • "muddiest point" <ul style="list-style-type: none"> • formative interview • assessment • Lab reports (3) • Chapter tests (2) 	<p>FOSS Science Unit:</p> <p>Structure of Living Things</p> <p>Discovering God's Creation - Martin Luther College (Boehlke/Klockziem)</p>
D E C E M		<ul style="list-style-type: none"> • Observe and record crayfish and land snail structures and behavior. • Use knowledge of crayfish and snail life requirements to maintain the organisms in the classroom. 	<ul style="list-style-type: none"> • SCI.LS1.B.m Animals engage in behaviors that increase the odds of reproduction. An organism's growth is affected by both genetic and environmental factors 	<ul style="list-style-type: none"> • Daily homework • Weekly quizzes • "muddiest point" formative interview assessment 	<p>OSS Science Unit:</p> <p>Structure of Living Things</p>

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B E R		<ul style="list-style-type: none">• Organize data about crayfish territorial behavior.• Develop responsibility for the care of organisms.<ul style="list-style-type: none">• Exercise language, art, social studies, and math skills in the context of life science.• Use scientific thinking processes to conduct investigations and build explanations: observing, communicating, comparing, and organizing		<ul style="list-style-type: none">• Lab reports (3)• Chapter tests (2)	Discovering God's Creation - Martin Luther College (Boehlke/Klockziem)
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J A N U A R Y		<ul style="list-style-type: none"> • Natural Resources and Renewable vs Non-renewable Energies • Deforestation vs Sustainable Forestry • Oil Drilling <ul style="list-style-type: none"> o Oceanic o Alaska and the Tundra o Fracking in the Dakotas • Aquaculture and Sustainability <ul style="list-style-type: none"> o Fish o Plastics, pollution and the ocean's environmental health 	ESS3.A: Natural Resources <ul style="list-style-type: none"> • State Standard for General Education: MS-ESS3-1: Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. • Essential Element: EE.MS-ESS3-1 <ul style="list-style-type: none"> o Target Level: Interpret, based on evidence, how the geoscience processes (e.g., weathering, erosion) create resources. o Precursor Level: Identify the geoscience process that produces a natural resource (e.g., solar energy creating wind energy, rock cycle with ores and minerals). o Initial Level: Identify a natural resource (e.g., water, sand, wind). 	<ul style="list-style-type: none"> • Daily homework • Weekly quizzes • "muddiest point" <ul style="list-style-type: none"> • formative interview • assessment • Lab reports (3) • Chapter tests (2) 	HMH Fusion Science Module D: The Living Planet- Unit 1
F E B R U A R Y		Weather Cycles and Climate Change Science <ul style="list-style-type: none"> • Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions. • Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. • Ask questions to identify and clarify evidence of an argument explaining whether or not human factors have caused the rise in global temperatures over the past century. 	ESS2.D: Weather and Climate <ul style="list-style-type: none"> • State Standard for General Education: MS-ESS2-6: Develop and use a model to describe how unequal heating and rotation of Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. • Essential Element: EE.MS-ESS2-6 <ul style="list-style-type: none"> o Target Level: Interpret basic weather information (e.g., radar, map) to make predictions about future conditions (e.g., precipitation, temperature, wind). o Precursor Level: Interpret basic weather information (e.g., radar, map) to compare weather conditions (either over several days at the same location or different locations on the same day). o Initial Level: Interpret basic weather information (e.g., radar, map) to identify weather conditions. 	<ul style="list-style-type: none"> • Daily homework • Weekly quizzes • "muddiest point" <ul style="list-style-type: none"> • formative interview • assessment • Lab reports (3) • Chapter tests (2) 	HMH Fusion Science Module D: The Living Planet- Unit 2

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M A R C H		<ul style="list-style-type: none"> • Describe the necessities of life and the characteristics of living things • Describe the role of genetic and environmental factors in the theory of evolution by natural selection and its mathematical impossibilities outside of a creator • Describe the role of microevolution and adaptation as a separate observable phenomenon from macro-evolution <ul style="list-style-type: none"> • Compare and contrast the evolutionary time scale and geologic ages vs. the creation science model and proofs in geology, the fossil record, and biology. • Classification of living things as proff of creation and the ordered world of our God. 	<ul style="list-style-type: none"> • LS2.A: Interdependent Relationships in Ecosystems • State Standard for General Education: MS-LS2-2: Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. • Essential Element: EE.MS-LS2-2 <ul style="list-style-type: none"> ○ Target Level: Use models of food chains/webs to identify producers and consumers in aquatic and terrestrial ecosystems. ○ Precursor Level: Classify animals based on what they eat (e.g., herbivore, omnivore, carnivore). ○ Initial Level: Identify food that animals eat. 	<ul style="list-style-type: none"> • Daily homework • Weekly quizzes • “muddiest point” formative interview assessment • Lab reports (3) • Chapter tests (2) 	HMH Fusion Science Module B: The Diversity of Living Things- Unit 1
A P R I L		<ul style="list-style-type: none"> • Describe the characteristics of archaea, bacteria, and viruses <ul style="list-style-type: none"> ○ Describe their reproduction or replication • Describe the characteristics of protists fungi, and explain how they grow and reproduce. • List the characteristics of plants and their classification. • Describe the processes by which plants reproduce, obtain energy, and respond to their environments. • Explain the characteristics of animals and describe different types of animals using a dichotomous key. <ul style="list-style-type: none"> • Describe behaviors that help animals survive and reproduce. 	<ul style="list-style-type: none"> • • LS3.B: Variation of Traits • • State Standard for General Education: MS-LS3-2: Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. ○ Essential Element: EE.MS-LS3-2 Target Level: <ul style="list-style-type: none"> • Make a claim supported by evidence that offspring inherit traits from their parents. • ○ Precursor Level: Identify similarities and differences between plant and animal parents and their offspring (e.g., eye color, hair/fur color, height, leaf shape, and/or markings). • ○ Initial Level: Recognize that organisms differ within same species (e.g., dogs, chickens, oaks that differ in color and size). 	<ul style="list-style-type: none"> • Daily homework • Weekly quizzes • “muddiest point” formative interview assessment • Lab reports (3) • Chapter tests (2) 	HMH Fusion Science Module C: The Diversity of Living Things- Unit 2

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M A Y		<ul style="list-style-type: none"> • Analyze the parts of an ecosystem. • Describe the flow of energy through an ecosystem. <ul style="list-style-type: none"> • Determine the factors that regulate the size of populations within an ecosystem. • Predict the outcomes of various interactions and factors among organisms in an ecosystem. <ul style="list-style-type: none"> • Describe the characteristics of different biomes that exist on land. • Describe the characteristics of marine, freshwater, and other aquatic ecosystems. • Describe how natural processes change ecosystems and help them develop after a natural disturbance. <ul style="list-style-type: none"> • Describe the effects of human activities on ecosystems, and explain the role of conservation in protecting natural resources. 	<ul style="list-style-type: none"> • • ESS3.C: Human Impacts on Earth Systems State Standard for General Education: MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. Essential Element: • EE.MS-ESS3-3 Target Level: Develop a plan to monitor and minimize a human impact on the local environment (e.g., water, land, pollution). Precursor Level: Recognize ways in which humans impact the environment (e.g., agriculture, pollution, recycling, city growth). Initial Level: Recognize resources (e.g., food, water, shelter, air) in the local • environment that are important for human life. 	<ul style="list-style-type: none"> • • Daily homework • • Weekly quizzes • • “muddiest point” <ul style="list-style-type: none"> • formative interview • assessment • • Lab reports (3) • • Chapter tests (2) 	HMH Fusion Science Module D: Ecology and The Environment: Units 1 & 2