Grade Curriculum Map for Grade 3
Instructional Plan for FOSS Science *(+added investigations and performance tasks)*
Steve Lehman
St. Paul's Lutheran School
Revised: June 2021

Grade 3 Curriculum
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Written by Steve Lehman
June 2021

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	Content Type	Objectives	Standards	Assessment	Materials
AUGUST & SEPTEMBER	• 24 • FOSS Structures of Life	Investigation 1- SWBAT: • Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. • Vocabulary: seed, fruit, estimate, histogram, property, dormant, embryo, seed coat, cotyledon • Part 1: What are the properties of a seed? • Part 2: What effect does water have on seeds? • Part 3: How much water does a seed soak up?	• SCI.CC1.3-5 Students identify similarities and differences in order to sort and classify natural objects and designed products. They identify patterns related to time, including simple rates of change and cycles, and use these patterns to make predictions. • SCI.CC2.3-5 Students routinely identify and test causal relationships and use these relationships to explain change. They understand events that occur together with regularity may or may not signify a cause-and-effect relationship. • SCI.SEP4.3-5 Analyze data to refine a problem statement or the design of a proposed object, tool, or process. Use data to evaluate and refine design solutions. • SCI.SEP5.3-5 Students extend quantitative measurements to a variety of physical properties, using computation and mathematics to analyze data and compare alternative design solutions. This includes the following: Organize simple data sets to reveal patterns that suggest relationships. Describe, measure, estimate, and/or graph quantities such as area, volume, weight, and time to address scientific and engineering questions and problems. Create and use graphs or charts generated from simple algorithms to compare alternative solutions to an engineering problem.	• Diagnostic assessments • Formative assessments • Summative assessments • Ipsative assessments • Norm-referenced assessments • Criterion-referenced assessments	FOSS Structures of Life Module
OCTOBER	• 20 • FOSS Structures of Life	Investigation 2- Growing Further • 1: How do plants change over time? • 2: How can you grow plants without soil? & What conditions do plants need in order to grow? • 3: What is the sequence of the bean plant's life cycle?	• SCI.SEP3.3-5 Make predictions about what would happen if a variable changes. Test two different models of the same proposed object, tool, or process to determine which better meets criteria for success. • SCI.SEP4.3-5 Students begin to use quantitative approaches to collect data and conduct multiple trials of qualitative observations. (When possible, digital tools should be used.) This includes the following: Represent data in tables or various graphical displays (bar graphs, pictographs, and pie charts) to reveal patterns that indicate relationships. Analyze and interpret data to make sense of phenomena, using logical reasoning, mathematics, or computation. Compare and contrast data collected by different groups in order to discuss similarities and differences in their findings. • SCI.LS1.A.4 Plants and animals have both internal and external macroscopic structures that allow for growth, survival, behavior, and reproduction. • SCI.LS1.B.3 Reproduction is essential to every kind of organism. Organisms have unique and diverse life cycles. • 3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles, but all have in common birth, growth, reproduction, and death. 4-LS1-1. Construct an argument that plants and animals have internal and external	• Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death. • Formative assessments (quiz, notes, drawings • Summative assessments	FOSS Structures of Life Module I

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			structures that function to support survival, growth, behavior, and reproduction. 4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. 5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water.		

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NOVEMBER	• 19 • FOSS Science Module: Pebbles, Sand, and Silt	Investigation 1- First Rocks SWBAT • classify, note, and differentiate the mineral portion of the planet on which they live. • investigate several kinds of volcanic rocks • begin to understand the properties of rocks. • observe rocks (using hand lenses), rub rocks, wash rocks, sort rocks, and describe rocks. • organize a class rock collection • learn about the properties of rocks and the colorful minerals they contain. Vocabulary • germination • seedling • growth • root • stem • leaf • hydroponics • nutrient • flower • life cycle	• SCI.CC6.3-5 Students understand different materials have different substructures, which can sometimes be observed, and substructures have shapes and parts that serve functions. • SCI.CC7.3-5 Students measure change in terms of differences over time and observe that change may occur at different rates. They understand some systems appear stable, but over long periods of time they will eventually change. • SCI.LS2.B.5 Matter cycles between the air and soil and among organisms as they live and die. • SCI.LS3.A.3 Many characteristics of organisms are inherited from their parents. Other characteristics result from individuals' interactions with the environment. Many characteristics involve both inheritance and environment. • SCI.LS3.B.3 Different organisms vary in how they look and function because they have different inherited information; the environment also affects the traits that an organism develops. • 3-LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms. 3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment.	• Construct an argument with evidence, data, and/or a model. • Use data to evaluate claims about cause and effect. • Make a claim about the merit of a solution to a problem by citing relevant evidence • Lab pages • Quizzes	Questions in the Project Folder Individual and Class Discussions Teacher Observation Student Journals Performance Assessment Tasks Data Sheets Lab Notebooks
DECEMBE	• 15 • FOSS Science Module: Energy	Investigation 1: Energy and Circuits Energy is evident whenever there is motion, electric current, sound, light, or heat. Energy can transfer from place to place. • An electric circuit is a system that includes a complete pathway through which electric current	• SCI.SEP3.3-5 Students plan and carry out investigations that control variables and provide evidence to support explanations or design solutions. This includes the following: Collaboratively plan and conduct an investigation to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. Evaluate appropriate methods and tools for collecting data. Make	Written Responses • What is needed to light a bulb? • What materials transfer electricity?	Questions in the Project Folder Individual and Class Discussions Teacher Observation Student Journals Performance

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R		flows from an energy source to its components. ● Conductors are materials through which electric current can flow; all metals are conductors. ● In a series circuit, there is a single pathway from the energy source to the components; in a parallel circuit, each component has its own direct pathway to the energy source. • The energy of two energy sources (D-cells or solar cells) adds when they are wired in series, delivering more power than a single source. Two cells in parallel have the same power as a single cell.	observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.	● How can you light two bulbs brightly with one D-cell? ● Which design is better for manufacturing long strings of ● lights—series or parallel ●	Assessment Tasks Data Sheets Lab Notebooks

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JANUARY	• 21 • FOSS Science Module: Energy	Investigation 2- Energy SWBAT Investigation 2: The Force of Magnetism • Investigate the phenomenon of magnets and their interactions with materials and each other. • Go outdoors and into other places on campus to find objects in the environment that are attracted to magnets. • Conduct an investigation to determine if like or opposite poles of a magnet attract. • Construct a simple compass and use it to detect magnetic effects. • Discover that magnetism can be induced in a piece of iron. • Investigate the strength of the force of attraction between two magnets by graphing data to look for patterns of interaction. • The magnetic force acting between magnets declines as the distance between them increases. • Earth has a magnetic field.	• SCI.CC3.3-5 Students recognize natural objects and observable phenomena exist from the very small to the immensely large. They use standard units to measure and describe physical quantities such as mass, time, temperature, and volume. • SCI.CC5.3-5 Students understand matter is made of particles and energy can be transferred in various ways and between objects. Students observe the conservation of matter by tracking matter flows and cycles before and after processes, recognizing the total mass of substances does not change. Note: In this grade band, students are not expected to be able to differentiate between mass and weight. • SCI.SEP6.A.3-5 Students use evidence to construct explanations that specify variables that describe and predict phenomena. This includes the following: Construct an explanation of observed relationships (e.g., the distribution of plants in the back yard). Use evidence (e.g., measurements, observations, patterns) to construct or support an explanation. Identify the evidence that supports particular points in an explanation. • SCI.PS1.A.4 Matter exists as particles that are too small to see. Matter is always conserved even if it seems to disappear. Measurements of a variety of observable properties can be used to identify particular materials.	• Diagnostic assessments • Formative assessments • Summative assessments • Ipsative assessments • Norm-referenced assessments • Criterion-referenced assessment • https://dpi.wi.gov/sites/default/files/imce/science/Energy-Collisions-Task-4th.pdf	Notebooks magnets iron filings, various metal objects Khan Academy Videos: Virtual Investigation: What Sticks and What Conducts?" "Magnetic Poles" "Magnetic Fields" "Magnetic Poles" "Magnetic Poles Quiz"
FEBRUARY	• 18 • FOSS Science Module:Environments	Investigation 1: Environmental Factors • All living things need food, water, a way to dispose of waste, and an environment in which they can live. • Animals and plants have structures and behaviors that serve various functions in growth, survival, and reproduction. • Animals detect, process, and use information about their environment to survive. • Different sense receptors are specialized for particular kinds of information gathering.	SCI.CC4.3-5 Students understand a system is a group of related parts that make up a whole and can carry out functions its individual parts cannot. They also describe a system in terms of its components and their interactions. SCI.SEP6.B.3-5 Students use evidence to create multiple solutions to design problems. This includes the following: Apply scientific ideas to solve design problems. Generate multiple solutions to a problem and compare how well they meet the criteria and constraints. SCI.SEP7.3-5 Construct and/or support an argument with evidence, data, or a model. Use data to evaluate claims about cause and effect. Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. SCI.LS2.A.5 The food of almost any animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the	• Artistic representation of different animal habitats • Food web illustration • "Adapt. Migrate, or Die" challenge game and simulation • Concept mapping in notebook with illustrated notes	

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		• An ecosystem is the interactions of organisms with one another and the abiotic environments. • Organisms have ranges of tolerance for environmental factors. • Organisms interact in feeding relationships (food chains and food webs). • Ecosystems are dynamic and change over time. • When the environment changes, some organisms and populations of organisms survive, thrive, and reproduce; others move, decline, or die.	animals that eat plants, while decomposers restore some materials back to the soil.		

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MARCH	• 17 FOSS Module: Environments	Investigation2: Ecosystems SWBATDescribe and Predict changes in ecosystems and human adaptations with their impacts: What will affect a place's physical characteristics, temperature, or availability of resources? Why do some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die? List some elements of biodiversity and human adaptations Populations live in a variety of habitats, and change in those habitats affects the organisms living there.	• SCI.SEP2.3-5 Develop a diagram or simple physical prototype to convey a proposed object, tool, or process. Use a model to test cause and effect relationships or interactions concerning the functioning of a natural or designed system. • 5 3-LS2-1. Construct an argument that some animals form groups that help members survive. 5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. • SCI.LS4.B.3 Differences in characteristics between individuals of the same species provide advantages in surviving and reproducing. • SCI.LS4.A.3 Particular organisms can only survive in particular environments. • SCI.LS4.D.3 Populations of organisms live in a variety of habitats. Change in those habitats affects the organisms living there. • 3-LS4-2. Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. 3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all. 3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.	• Developing and using models with clay, paper, and string • Planning and carrying out investigations • Analyzing and interpreting data in a lab study of an ecosystem • Constructing explanations for changes in an ecosystem • Engaging in argument from evidence on climate change • quizzes • investigation notebook scored by rubric	
APRIL	• • FOSS Science Module: Sound Design	Investigation 1-Sound and Vibrations SWBAT • Vibration is a rapid back-and-forth motion. Vibrating objects make sound. • A sound receiver detects sound vibrations. Ears are one kind of sound receiver. • Differences in pitch are caused by differences in the length and tension of the vibrating objects. • Fast vibrations produce high-pitched sounds. Slow vibrations produce low-pitched sounds. • Frequency refers to how slow or fast a source vibrates. A fast vibration is called a high frequency sound.	• SCI.SEP1.A.3-5 Students ask questions that specify qualitative relationships. This includes the following: Ask questions about what would happen if a variable is changed. Identify scientific (testable) and non-scientific (nontestable) questions. Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.	• Developing and using models with clay, paper, and string • Planning and carrying out investigations • Analyzing and interpreting data in a lab study of an ecosystem • Constructing explanations for changes in an ecosystem • Engaging in argument from evidence on climate change • quizzes	Theme song: "Good Vibrations" Online investigations: "Sound Cards" "Oscilloscope" "Guitar String Pitch"

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		• The intensity of the vibration determines the volume • Differences in pitch are caused by differences in the rate at which objects vibrate. Length of and tension on a string affect the rate of vibration and therefore the pitch.		• investigation notebook scored by rubric	

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MAY	• 24 • FOSS Module Sound Design	Investigation 2-Engineering Sound Investigation 3: Making and Moving Sound SWBAT • Possible solutions to a problem are limited by available materials and resources (constraints). • The success of a designed solution is determined by considering the desired features of a solution (criteria). • An object starts vibrating when energy is transferred to it. • Sound vibrations need a medium to travel. • Sound travels through gas such as air, liquids such as water, and solids such as wood. The more dense the medium, the faster sound travels. • A sound receiver detects sound vibrations. Animals have different kinds of sound receivers. • Animals rely on communication to find mates, protect young, find food, and detect predators, and move safely through their environment.	• SCI.CC2.3-5 Students routinely identify and test causal relationships and use these relationships to explain change. They understand events that occur together with regularity may or may not signify a cause-andeffect relationship. • SCI.SEP1.B.3-5 Students use prior knowledge to describe and define simple design problems that can be solved through the development of an object, tool, process, or system. They include several criteria for success and constraints on materials, time, or cost. • SCI.SEP2.3-5 Students build and revise simple models and use models to represent events and design solutions. This includes the following: Identify limitations of models. Collaboratively develop and/or revise a model based on evidence that shows the relationships among variables for frequent and regular occurring events. Develop a model using an analogy, example, or abstract representation to describe a scientific principle or design solution. Develop and/or use models to describe or predict phenomena.	• Rubrics for • research,/developme nt of an instrument • engineering process development sheet • aesthetics and design • function: is it tunable or adaptable • bonus points for being able to play a specific tune (class vote)	Various materials for constructing an instrument Online VIdeos: Wintergatan Marble Machine Cricket Wings and Sound