Grade 5 Curriculum Map
Instructional Plan for Grade 5
Steve Lehman
St. Paul's Lutheran School
Revised: June 2021

Grade 5 Curriculum
Instructional Plan for Grade 5 Science
Submitted by Steve Lehman
Written: June 2021

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	Content Type	Objectives	Standards	Assessment	Materials

AUGUST & SEPTEMBER	• 24
	• FOSS Module Liquids and Solids
		• Make and separate mixtures, using screens, filters, and evaporation.
		• Measure solids and liquids to compare the mass of a mixture to the mass of its parts.
		• Use a balance to determine relative concentration. Layer solutions to determine relative density (concentration).
		• Plan and conduct saturation investigations. Compare the solubility of substances in water.
		• Identify an unknown substance based on the properties of solubility and crystal form.
		• Observe and compare reactants and products of several chemical reactions.
		• Two Key Understandings:
		  ○ Matter exists in three states (solid, liquid, and gas), which have observable properties.
		  ○ Matter has physical properties that can be observed and quantifi ed (e.g., density, solubility, conductivity).
			• 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.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.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 (non-testable) questions.
			Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.
			• SCI.SEP6.A.3-5 Students use evidence to construct explanations that specify variables which 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.5 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.
			•
				• Daily homework
				• Weekly quizzes
				• "muddiest point" formative interview assessment
				• Lab reports (3)
				• Chapter tests (2)
					Investigation 1: Separating Mixtures liquids, solids, screens, filters, jars, outdoors (walk to Phelan Park and Wilson Creek)
					
					lab notebooks, investigation notes
					
					Investigation 2: Concentration
					
					balances, soft drinks, salts, water, jars, stir sticks magnifying glasses

OCTOBER	• 20 • FOSS Module: Liquids & Solids • FOSS MOdule	• Determine the mass and level of saturation for two different salt mixtures. • Determine a mystery substance by its properties • Use a balance to determine mass and solubility of 50mL of water with various powders • Review Four Key Understandings	• 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. •	• Daily homework • Weekly quizzes • vocabulary sort formative assessment • Lab reports (3) • Chapter tests (2)	Investigation 3: Reaching Saturation

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		o Mass of material is conserved. o Change of temperature can produce changes in physical state. o During physical interactions, substances form mixtures in which the interacting substances retain their original properties. o During chemical interactions, starting substances (reactants) change into new substances (products).			

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NOVEMBER	• 19 • FOSS Module: Earth & Sun	• Shadows are the dark areas that result when light is blocked. • Shadows change during the day because the position of the Sun changes in the sky. • The length and direction of a shadow depends on the Sun's position in the sky. • Day is the half of Earth's surface being illuminated by sunlight; night is the half of Earth's surface in its own shadow. • The cyclical change between day and night is the result of Earth's rotating around the stationary Sun, Earth's star. • Chart the declination of the sun throughout the month each day at the same time. • The earth's location in the solar system affects magnetism. • THe earth's relationship to the moon creates tides.	• SCI.SEP5.A.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. • SCI.PS2.B.3 Some forces act through contact, some forces (e.g. magnetic, electrostatic) act even when the objects are not in contact. • SCI.PS2.B.5 The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center. • 5-PS2-1. Support an argument that the gravitational force exerted by Earth on objects is directed down.	• Daily homework • Weekly quizzes • exit slips - formative assessment • Lab reports (3) • Chapter tests (2)	Investigation 1: Heating Earth Science Resources Book "Changing Shadows" "Sunrise and Sunset" Online Activities "Shadow Tracker" "Sun Tracking" "Seasons"
DECEMBER	• 15	• The solar system includes the Sun, a star, and the objects that orbit it, including Earth, the Moon, seven other planets, their satellites, and smaller objects. • The Moon is much smaller than Earth and orbits at a distance equal to about 30 Earth diameters.	• SCI.SEP2.A.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.	• Daily homework • Weekly quizzes • essay assessment on ecology and stewardship - rubric scored • Lab reports (2) • Chapter tests (2)	Science Resources Book "The Night Sky" "Looking through Telescopes" "Comparing the Size of Earth and the Moon" "Apollo 11 Space Mission"

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		• The Sun is 12,000 Earth diameters away from Earth and is more than 100 times larger than Earth. • Gravity is a pulling force between two masses; it is the force that pulls things toward the center of Earth. The pulling force of gravity keeps the planets and other objects in orbit by continuously changing their direction of travel. • Students will research and debate the disproven theories of cosmology from history, including modern flat-earth theories.	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. 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. • SCI.SEP8.A.3-5 Students evaluate the merit and accuracy of ideas and methods. This includes the following: • Read and comprehend grade-appropriate complex texts and other reliable media to summarize and obtain scientific and technical ideas, and describe how they are supported by evidence. Compare and/or combine information across complex texts and other reliable media to support the engagement in scientific and engineering practices. Combine information in written text with that contained in corresponding tables, diagrams, or charts to support the engagement in other scientific and engineering practices. Obtain and combine information from books or other reliable media to explain phenomena or solutions to a design problem. Communicate scientific and technical information orally or in written formats, including various forms of media, which may include tables, diagrams, and charts.		"How Did Earth's Moon Form?"

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JANUARY	• 21	• A great deal of light travels through space to Earth from the Sun and from distant stars. • Stars are at different distances from Earth. The Sun is the closest star to Earth, so it appears brighter and larger. • The side of Earth facing the Sun is always in daylight; the side facing away from the Sun is always in darkness. Because of the brightness of the Sun, we can only see stars outside our solar system when we are on the dark half of Earth (at night). • Construct a model of the solar system	• SCI.SEP3.A.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 observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. 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.ESS1.A.5 Stars range greatly in size and distance from Earth, and this can explain their relative brightness • SCI.ESS1.B.5 The Earth's orbit and rotation, and the orbit of the moon around the Earth cause observable patterns. • SCI.ESS1.C.4 Certain features on Earth can be used to order events that have occurred in a landscape. • 5-ESS1-2. Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. •	• Daily homework • Weekly quizzes • 3 new forms of formative assessment • Rubric for model of the solar system • Chapter tests (2) • Online Activities o "Lunar Calendar" o "Star Maps" o "Stellar Motions"	Science Resources Book "Exploring the Solar System" "Planets of the Solar System" "Why Doesn't Earth Fly Off into Space?" "Stargazing" "Star Scientists" "Our Galaxy"
FEBRUARY	• 18	• Unit and Investigation 3: Water Planet • A solar water heater is a system that uses solar energy to heat water. • People can protect Earth's resources and environments by using alternative energy sources • Natural and human forces can and do change the surface of the earth. • Evaporation and condensation is the movement of water through the water cycle • As temperature increases, the rate of evaporation increases. • Most of Earth's water (97%) is salt water in the ocean;	• 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.ESS2.C.5 Most of Earth's water is in the ocean, and much of the Earth's freshwater is in glaciers or underground. • SCI.ESS2.A.4,5 Four major Earth systems interact. Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, organisms, and gravity break rocks, soils, and sediments into smaller pieces and move them around. • SCI.ESS2.B.4 Earth's physical features occur in patterns, as do earthquakes and volcanoes. Maps can be used to locate features and determine patterns in those events.	• Performance assessment • Response sheet • Science notebook entries • Simulation: "Water-Cycle Game" • Online Assessment "Climate Regions Map"	Science Resources Book • "Condensation" • "Where Is Earth's Water?" • "The Water Cycle" • "Severe Weather" • "Earth's Climates" • "Global Climate Change"

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		• Earth's fresh water is found in the atmosphere, lakes and rivers, soil, ground ice, ground water, and glaciers. • The Sun's energy drives weather. • Climate is the average or typical weather that can be expected to occur in a region of Earth's surface. Earth's climate is changing. • Devise ways to live with less impact on the Earth's ecosystems and resources with a new invention: design, draw, construct, and pitch your item to the class. Work in small teams. • Explore and discuss the history and pros/cons (mill pond/algae) of the Red Cedar River dam (the world's first modern dam.)	• SCI.ESS2.D.3 Climate describes patterns of typical weather conditions over different scales and variations. Historical weather patterns can be analyzed. • SCI.ESS2.E.4 Living things can affect the physical characteristics of their environment. • 4-ESS2-1. Make observations and measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. • 4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features. • 5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and atmosphere interact. • 5-ESS2-2. Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. • SCI.ESS3.B.3,4 A variety of hazards result from natural processes; humans cannot eliminate hazards but can reduce their impacts. • SCI.ESS3.C.5 Societal activities have had major effects on the land, ocean, atmosphere, and even outer space. Societal activities can also help protect Earth's resources and environments. • 4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans. • 5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment • SCI.ETS1.A.3-5 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). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. • SCI.ETS1.B.3-5 Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved.		

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			• SCI.ETS1.C.3-5 Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. • 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. • 3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. • 3-5-ETS1-2. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. • 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. • 4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans. • SCI.ETS3.B.3-5 Science and engineering are both bodies of knowledge and processes that add new knowledge to our understanding. • Scientific findings are limited to what can be supported with evidence from the natural world. • Basic laws of nature are the same everywhere in the universe (e.g. gravity, conservation of matter, energy transfer, etc.). • Engineering solutions often have drawbacks as well as benefits. •		

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MARCH	• 17 • FOSS Module: Living Systems	Investigation 1: Living Systems • Describe a system as a collection of interacting objects, ideas, and/or procedures that together define a physical entity or process. • Understanding earth can be described as the interaction of four earth systems: the rocky part (the geosphere), the atmosphere, the water (the hydrosphere), and the complexity of living organisms (the biosphere). • Classify a webs' producers, consumers, and decomposers • Compare a kelp forest's similarities to a rainforest (vertical layering). • Describe how phytoplankton are the major producers in most aquatic systems (both marine and freshwater). • Construct food webs and note competition for resources exist in marine systems. • Present a diorama of a living system Investigation 2: Nutrient Systems • Identify yeast as a single-celled fungus. Dormant yeast cells can become active when provided with water, warmth, and sugar as a food source. Carbon dioxide is a waste by-product of yeast metabolism. • Chlorophyll is the green pigment that absorbs sunlight in the cells of producer organisms. • Identify nutrient is a substance, such as sugar or starch, that is used by a cell to produce the energy needed to perform the functions of life. • Plants make their own food by photosynthesis. Green plant cells make sugar (food) from carbon dioxide and water in the presence of sunlight, and release oxygen. • Animals obtain nutrients by eating other organisms.	• 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.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.LS1.A.4 Plants and animals have both internal and external macroscopic structures that allow for growth, survival, behavior, and reproduction. • SCI.LS1.C.5 Food provides animals with the materials and energy they need for body repair, growth, warmth, and motion. Plants acquire material for growth chiefly from air, water, and process matter, and obtain energy from sunlight, which is used to maintain conditions necessary for survival. • 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 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. • 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 animals that eat plants, while decomposers restore some materials back to the soil. • SCI.LS2.B.5 Matter cycles between the air and soil and among organisms as they live and die. • SCI.PS3.D.4, 5 Plants capture energy from sunlight which can be used as fuel or food. Stored energy in food or fuel can be converted to useable energy. • 5-PS3-1. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.	• Daily homework • Weekly quizzes • illustration and caption poster project • Lab reports (2) • Chapter tests (1)	**Science Resources Book** "Introduction to Systems" "Is Earth a System?" "The Biosphere" "Monterey Bay National Marine Sanctuary" "Comparing Aquatic and Terrestrial Ecosystems" "Nature's Recycling System" **Videos** Physical Systems Web of Life: Life in the Sea **Online Activity** "Simulation: Food Webs"

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		• Digestion is the process used by animals to break down complex food items into simple nutrients.	• SCI.ESS3.A.4 Energy and fuels humans use are derived from natural sources, and their use affects the environment. Some resources are renewable over time, others are not. •		
APRIL	• 20	Investigation 4: Transport Systems • DIstinguish and elaborate how vascular plants have xylem tubes in a one-way flow and phloem tubes to carry sugar from the leaves to all the cells that need it. • Draw and label vascular bundles as arranged in predictable patterns of veins in the leaves of vascular plants. • Describe the human circulatory system, in which blood transports resources to the cells and waste from the cells. • Note how the respiratory system transports oxygen to the blood and carbon dioxide from the blood. • Delineate how cells have basic needs: water, food, gas exchange, and waste disposal. Multicellular organisms have systems for transporting nutrients and wastes.	• 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.SEP4.A.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 t3-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. in their findings. •	• Daily homework • Weekly quizzes • entrance five point list formative assessment • Lab reports (2) • Chapter tests (1)	**Science Book** "Leaf Classification" "Plant Vascular Systems" "The Story of Maple Syrup" "The Human Circulatory System" "The Human Respiratory System" "Other Circulatory and Respiratory Systems" **Videos** Plant Structure and Growth Circulatory and Respiratory Systems **Online Activities** "Plant Vascular System" "Mammalian Circulatory System"

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M A Y	• 24 • FOSS Module: Living Systems	Investigation 3: Sensory Systems • A stimulus is something that triggers (starts) a response. A stimulus is often information received through the senses. • A response is a reaction of a living thing to a stimulus. • Animal adaptations include pattern and color that attract attention to warn predators off or to attract a mate. • Animals communicate to warn others of danger, scare predators away, or locate others of their kind, including family members. • Instinctive behaviors, such as knowing what to eat, how to find shelter, and how to migrate, help organisms survive. • Cite examples of adaptation in plants and animals in our ecosystem. • Marine ecosystems have biotic (living) and abiotic (nonliving parts). The ocean plays an important role in the carbon cycle. • Describe changes in the oceanic biome which have caused extinction or overpopulation. • Explore how non-native species can and have caused imbalances and extinction or overpopulation in local ecosystems (such as garlic mustard/dandelions in North America or Asian carp in the Great Lakes.) • Explore ecologically friendly building methods and explore ideas for greener natural building materials in our area.	• 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.LS1.D.4 Different sense receptors are specialized for particular kinds of information; animals use their perceptions and memories to guide their actions. • SCI.LS2.C.3 When the environment changes, some organisms survive and reproduce, some move to new locations, some move into transformed environments, and some die. • SCI.LS2.D.3 Being part of a group helps animals obtain food, defend themselves, and cope with changes. • 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. • SCI.LS4.D.3 Populations of organisms live in a variety of habitats. Change in those habitats affects the organisms living there. • 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. • 3-ETS3-1. Obtain and evaluate information showing that different cultures have created different tools and technologies to survive in different types of environments (LS2.C.3). • 4-ETS3-1. Construct an explanation for how energy is transferred in a system, and then revise that explanation based on new evidence (PS3.B.4). • 5-ETS3-1. Investigate properties of materials to provide evidence as to which would best work within an engineering design solution (PS1.A.5).	• Daily homework • Weekly quizzes • "muddiest point" formative interview assessment • Lab reports (2) • Chapter test (1)	**Science Resources** **Book** "Stimulus and Response in Humans" "Sensory Systems" "Animal Communication" "Monarch Migration" "North Atlantic Ocean Ecosystem" **Videos** The Brain and Nervous System Animal Behavior and Communication Bugs Incredible Journeys: A Butterfly's Relay Marine Ecosystems **Online Activity** "Response Timer"

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