

MSAD #54 Science Curriculum

Content Area: Science
Unit: Unifying Themes

Grade: Grade 3
MLR Span: 3-5

MLR Content Standard: A: Unifying Themes

Students apply the principles of systems, models, constancy and change, and scale in science and technology.

*Assessment

Unifying Themes:	MLR Performance Indicators	MSAD #54 Objectives	Instructional Resources/Activities
A1 Systems	<p>1. Students explain interactions between parts that make up whole man-made and natural things.</p> <p>a. Give examples that show how individual parts of organisms, ecosystems, or man-made structures can influence one another.</p> <p>b. Explain ways that things including organisms, ecosystems, or man-made structures may not work as well (or at all) if a part is missing, broken, worn out, mismatched, or misconnected.</p>		<p>Standards A-C are unifying themes and should be embedded in Standards D and E. Please work to accomplish these objectives when you complete the units in Standards D and E.</p> <p>a-b. All units</p>
A2 Models	<p>2. Students use models to represent objects, processes, and events from the physical setting, the living environment, and the technological world.</p> <p>a. Represent the features of a real object, event, or process using models</p>		<p>a-b. All units</p>

	<p>including geometric figures, number sequences, graphs, diagrams, sketches, maps, or three-dimensional figures and note ways in which those representations do (and do not) match features of the originals.</p>		
<p>A3 Constancy and Change</p>	<p>3. Students identify and represent basic patterns of change in the physical setting, the living environment, and the technological world.</p> <p>a. Recognize patterns of change including steady, repetitive, irregular, or apparently unpredictable change.</p> <p>b. Make tables or graphs to represent changes.</p>		<p>a-b. All units</p>
<p>A4 Scale</p>	<p>4. Students use mathematics to describe scale for man-made and natural things.</p> <p>a. Measure things to compare sizes, speeds, times, distances, and weights.</p> <p>b. Use fractions and multiples to make comparisons of scale.</p>		<p>a-b. All units</p>

MSAD #54 Science Curriculum

Content Area: Science
 Unit: Skills & Traits

Grade: Grade 3
 MLR Span: 3-5

MLR Content Standard: B. The Skills and Traits of Scientific Inquiry And Technological Design

Students plan, conduct, analyze data from and communicate results of in-depth scientific investigations; and they use a systematic process, tools, equipment, and a variety of materials to create a technological design and produce a solution or product to meet a specified need.

Skills and Traits	MLR Performance Indicators	MSAD #54 Objectives	Instructional Resources/Activities
<p>B1 Skills and Traits of Scientific Inquiry</p>	<p>1.Students plan, conduct, analyze data from, and communicate results of investigations, including fair tests.</p> <p>a.Pose investigable questions and seek answers from reliable sources of scientific information and from their own investigations.</p> <p>b.Plan and safely conduct investigations including simple experiments that involve a fair test.</p> <p>c.Use simple equipment, tools, and appropriate metric units of measurement to gather data and extend the senses.</p> <p>d.Use data to construct and</p>		<p>a-e.All units</p>

<p>B2 Skills and Traits of Technological Design</p>	<p>support a reasonable explanation.</p> <p>e. Communicate scientific procedures and explanations.</p> <hr/> <p>2. Students use a design process, simple tools, and a variety of materials to solve a problem or create a product, recognizing the constraints that need to be considered.</p> <p>a. Identify and explain a simple design problem and a solution related to the problem.</p> <p>b. Propose a solution to a design problem that recognizes constraints including cost, materials, time, space, or safety.</p> <p>c. Use appropriate tools, materials, safe techniques, and quantitative measurements to implement a proposed solution to a design problem.</p> <p>d. Balance simple constraints in carrying out a proposed solution to a design problem.</p> <p>e. Evaluate their own design results, as</p>	<hr/>	<hr/> <p>a-g. All units</p>
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	<p>well as those of others, using established criteria.</p> <p>f.Modify designs based on results of evaluations.</p> <p>g.Present the design problem, process and design or solution using oral, written, and/or pictorial means of communication.</p>		
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MSAD #54 Science Curriculum

Content Area: Science
 Unit: Scientific & Technological Enterprise

Grade: Grade 3
 MLR Span: 3-5

MLR Content Standard: **C. The Scientific and Technological Enterprise**
 Students understand the history and nature of scientific knowledge and technology, the processes of inquiry and technological design, and the impacts science and technology have on society and the environment.

Scientific & Technological Enterprise	MLR Performance Indicators	MSAD #54 Objectives	Instructional Resources/Activities
C1 Understandings of Inquiry	1.Students describe how scientific investigations results in explanations that are communicated to other scientists. a.Describe how scientists answer questions by developing explanations based on observations, evidence and knowledge of the natural world. b.Describe how scientists make their explanations public.		a-b.All units.
C2 Understandings About Science and Technology	2.Students describe why people use science and technology and how scientists and engineers work. a.Describe how scientists seek to answer questions and explain the natural world. b.Describe how engineers seek solutions to problems through the design and production of products.		*D1-D2

<p>C3 Science, Technology, and Society</p>	<p>3.Students identify and describe the influences of science and technology on people and the environment.</p> <p>a.Explain how scientific and technological information can help make safe and healthy decisions.</p> <p>b.Give examples of changes in the environment caused by natural or man-made influences.</p> <p>c.Explain that natural resources are limited, and that reusing, recycling, and reducing materials and using renewable resources is important.</p>		
<p>C4 History and Nature of Science</p>	<p>No performance indicator.</p>		

MSAD #54 Science Curriculum

Content Area: Science
Unit: Physical Setting

Grade: Grade 3
MLR Span: 3-5

MLR Content Standard: D. The Physical Setting

Students understand the universal nature of matter, energy, force, and motion and identify how these relationships are exhibited in Earth Systems, in the solar system, and throughout the universe.

Physical Setting	MLR Performance Indicators	MSAD #54 Objectives	Instructional Resources/Activities
D1 Universe and Solar System	<p>1.Students describe the positions and apparent motions of different objects in and beyond our solar system and how these objects can be viewed from Earth.</p> <p>a.Show the locations of the sun, Earth, moon, and planets and their orbits.</p>	<p>Students will:</p> <p>a1. view the moon during the daytime and track its apparent path across the sky.</p> <p>a2. explore their questions about the moon and brainstorm how to find answers.</p> <p>a3. conduct a month-long series of daily observations of the moon, recording its changing shape on a class chart.</p> <p>a4. look at their data and articulate the pattern of the moon’s cycle and record their initial ideas about what they think causes the moon’s cycle.</p> <p>a5. learn and practice a model that reflects astronomers’ understanding about the causes of the moon’s cycle.</p> <p>a6. research the planets, and create and present reports about</p>	<p>a1-c2.Science Companion materials: <i>Our Solar System</i></p>

	<p>b. Observe and report on observations that the sun appears to move across the sky in the same way every way, but its path changes slowly over the seasons.</p>	<p>the planets.</p> <p>a7. carry tiny scale models of the planets and pace the immense distances between them.</p> <p>a8. compare the sizes of scale models of the sun, moon, and Earth.</p> <p>a9. learn that the sun and moon can appear to be the same size because the sun is much further away.</p> <p>a10. chart their knowledge and questions about the solar system and what lies beyond it.</p> <p>a11, b1. observe the sun several times throughout the day and discern how it seems to move across the sky.</p> <p>a12, b2. create and use models that explain their observations of daytime and nighttime and the sun's apparent movement across the sky.</p> <p>b3. explore their ideas about reasons for daytime and nighttime.</p> <p>b4. consider the sun as Earth's source of light, and observe the effect sunlight has on Earth in terms of heat and shadows.</p> <p>b5. observe how the apparent path of the sun slowly changes during the year by using scientific tools to track its position in the fall, winter and spring.</p> <p>b6. model their observations using flashlights on the scientific</p>	
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	<p>c. Recognize that the sun is a star and is similar to other stars in the universe.</p>	<p>tools.</p> <p>b7. assume the role of class astronomer to collect weekly sunrise and sunset data.</p> <p>b8. consider the relationship between the apparent height of the sun in the sky and the length of daylight.</p> <p>b9. will use a globe and a lamp to model Earth's orbit around the sun.</p> <p>b10. observe how the orbit, and the tilt of the earth on its axis, relates to changes in the length of daylight and the apparent path of the sun throughout the year.</p> <p>c1. observe how stars appear to move across the nighttime sky and discover why stars aren't visible during the daytime.</p> <p>c2. study pictures of planets and their changing positions against a stable background of stars.</p> <p>**Use Science notebooks to record all observations, notes, etc.</p>	
<p>D2 Earth</p>	<p>2. Students describe the properties of Earth's surface materials, the processes that change them, and cycles that affect the Earth.</p> <p>a. Explain the effects of the rotation of Earth on the day/night cycle, and how that cycle affects local temperature.</p>	<p>Students will:</p> <p>a1. explore their ideas about reasons for daytime and nighttime.</p> <p>a2. consider the sun as Earth's source of light, and observe the</p>	<p>a1-a2. Science Companion materials: <i>Our Solar System</i></p>

	<p>b. Describe the various forms water takes in the air and how that relates to weather.</p> <p>c. Give several reasons why the climate is different in different regions of the Earth.</p> <p>d. Explain how wind, waves, water, and ice reshape the surface of Earth.</p> <p>e. Describe the kinds of materials that form rocks and soil.</p> <p>f. Recognize that the sun is the source of Earth's surface heat and light energy.</p> <p>g. Explain how the substance called air surrounds things, takes up space, and its movement can be felt as wind.</p>	<p>effect sunlight has on Earth in terms of heat and shadows.</p> <p>f1. observe the sun several times throughout the day and discern how it seems to move across the sky.</p> <p>f2. create and use models that explain their observations of daytime and nighttime and the sun's apparent movement across the sky.</p> <p>**Use Science notebooks to record all observations, notes, etc.</p>	
<p>D3 Matter and Energy</p>	<p>3. Students describe properties of objects and materials before and after they undergo a change or interaction.</p> <p>a. Describe how the</p>	<p>Students will</p>	

	<p>weight of an object compares to the sum of the weight of its parts.</p> <p>b.Illustrate how many different substances can be made from a small number of basic ingredients.</p> <p>c.Describe properties of original materials, and the new material(s) formed, to demonstrate that a change has occurred.</p> <p>d.Describe what happens to the temperatures of objects when a warmer object is near a cooler object.</p> <p>e.Describe how the heating and cooling of water and other materials can change the properties of the materials.</p> <p>f.Explain that the properties of a material may change but the total amount of material remains the same.</p> <p>g.Explain that materials can be composed of parts too small to be seen without magnification.</p>		
<p>D4 Force and Motion</p>	<p>4.Students summarize how various forces affect the motion of</p>	<p>Students will</p>	

	<p>objects.</p> <p>a.Predict the effect of a given force on the motion of an object.</p> <p>b.Describe how fast things move by how long it takes them to go a certain distance.</p> <p>c.Describe the path of an object.</p> <p>d.Give examples of how gravity, magnets, and electrically charged materials push and pull objects.</p>		
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MSAD #54 Science Curriculum

Content Area: Science
Unit: The Living Environment

Grade: Grade 3
MLR Span: 3-5

MLR Content Standard: E. The Living Environment

Students understand that cells are the basic unit of life, that all life as we know it has evolved through genetic transfer and natural selection to create a great diversity of organisms, and that these organisms create interdependent webs through which matter and energy flow. Students understand similarities and differences between humans and other organisms and the interconnections of these interdependent webs.

Living Environment	MLR Performance Indicators	MSAD #54 Objectives	Instructional Resources/Activities
E1 Biodiversity	<p>1. Students compare living things based on their behaviors, external features, and environmental needs.</p> <p>a. Describe how living things can be sorted in many ways, depending on which features or behaviors are used to sort them, and apply this understanding to sort living things.</p> <p>b. Describe the changes in external features and behaviors of an organism during its life cycle.</p>	<p>Students will</p> <p>b1. study human life-cycle stages and see how these stages repeat themselves from one generation to the next.</p> <p>b2. discuss the basis for physical and intellectual growth and track this growth over the course of the school year.</p> <p>b3. study a class tree. Through careful observation and measurement, see how the tree grows and changes during the school year.</p> <p>b4. examine the life cycle of a pea plant.</p>	<p>b1-b10. Science Companion materials: <i>Life Cycles</i></p>

		<p>b5.look at soaked and dry seeds, plant sprouts and study the growth of plants under different conditions.</p> <p>b6.examine a wide variety of flowers and learn how flowers grow into fruits and seeds.</p> <p>b7.study the life cycle of Painted Lady Butterflies.</p> <p>b8.create a life-stage calendar for the butterflies.</p> <p>b9.observe, measure, and draw caterpillars, examine their chrysalises and compare the eating behavior of caterpillars with that of the emergent butterflies.</p> <p>b10.observe butterfly mating behaviors and , if conditions are right, see tiny caterpillars hatch from freshly laid eggs.</p> <p>**Use Science notebooks to record all observations, notes, etc.</p>	
<p>E2 Ecosystems</p>	<p>2. Students describe ways organisms depend upon, interact within, and change the living and non-living environment as well as ways the environment affects organisms.</p> <p>a.Explain how changes in an organism’s habitat can influence its survival.</p> <p>b.Describe that organisms all over the Earth are living, dying, and decaying and</p>	<p>Students will</p>	

	<p>new organisms are being produced by the old ones.</p> <p>c. Describe some of the ways in which organisms depend on one another, including animals carrying pollen and dispersing seeds.</p> <p>d. Explain how the food of most animals can be traced back to plants and how animals use food for energy and repair.</p> <p>e. Explain how organisms can affect the environment in different ways.</p>		
<p>E3 Cells</p>	<p>3. Students describe how living things are made up of one or more cells and the ways cells help organisms meet their basic needs.</p> <p>a. Give examples of organisms that consist of a single cell and organisms that are made of a collection of cells.</p>	<p>Students will:</p> <p>a1. learn about the history of the discovery of cells and cell theory.</p> <p>a2. explore magnification of plant and animal organisms using a hand lens.</p> <p>a3. observe microscope images of cells and small organisms.</p> <p>a4, b1. discuss structure and function of objects.</p> <p>a5, b2. discuss the levels of organization in the human body.</p> <p>a6, b3. understand the concept of multicellular and unicellular organisms.</p>	<p>a-b. Carolina kit: <i>Understanding Cells and DNA</i></p>

	<p>b. Compare how needs of living things are met in single-celled and multi-celled organisms.</p>	<p>a7, b4. reinforce the understanding of cell organelles and their function.</p> <p>a8, b5. investigate the structure of plant and animal cells through model building.</p> <p>a9, b6. identify and distinguish the organelles of plant and animal cells.</p> <p>a10, b7. compare and contrast the structure and function of plant and animal cells.</p> <p>b8. identify the differences between plant and animal cells.</p> <p>b9. identify organelles of plant and animal cells and communicate the different functions of cell organisms.</p> <p>**Use Science notebooks to record all observations, notes, etc.</p>	
<p>E4 Heredity and Reproduction</p>	<p>4. Students describe characteristics of organisms, and the reasons why organisms differ from or are similar to their parents.</p> <p>a. Name some likenesses between children and parents that are inherited, and some that are not.</p>	<p>Students will:</p> <p>a1, b1. identify heritable characteristics and acquired characteristics.</p> <p>a2, b2. understand that heritable characteristics are passed from one generation to the next.</p>	<p>a-b. Carolina kit: <i>Understanding Cells and DNA</i></p> <p>a-b. Science Companion materials: <i>Life Cycles</i></p>

	<p>b.Explain that in order for offspring to look like their parents, information related to inherited likenesses must be handed from parents to offspring in a reliable manner.</p>	<p>a3, b3. make observations of some of their heritable characteristics and discover that traits are the way in which heritable traits are expressed, and that there are different traits to express the same characteristics.</p> <p>b4. reinforce the understanding that DNA is present in the nucleus of plant and animal cells and learn that DNA carries hereditary information that determines traits.</p> <p>b5. explore DNA by extracting it from strawberries.</p> <p>**Use Science notebooks to record all observations, notes, etc.</p>	
<p>E5 Evolution</p>	<p>5.Students describe the fossil evidence and present explanations that help us understand why there are differences among and between present and past organisms.</p> <p>a.Explain advantages and disadvantages gained when some individuals of the same kind are different in their characteristics and behavior.</p> <p>b.Compare fossils to one another and to living organisms according to their similarities and differences.</p>	<p>**Use Science notebooks to record all observations, notes, etc.</p>	<p>a-b.Science Companion materials: <i>Life Cycles</i></p> <p>Teacher directed extensions to meet these standards should be developed.</p>