

# Detailed Map: Grade 5 Science

Month / No. of Weeks Standards	Content	Skills	Assessment
<p><b>Month(s) <u>September and October</u></b>  <b><u>Standards</u></b>            Gr.3-5 Science            Earth and Space            (Review)            10. Describe how water on earth cycles in different forms and in different locations, including underground and in the atmosphere.            11. Give examples of how cycling of water, both in and out of the atmosphere, has an effect on climate ( Add in )            6. Explain how air temperature, moisture, wind speed, and precipitation make up the weather in a particular place and time.            7. Distinguish among the various forms of precipitation, making connections to the weather in a particular place and time.            8. Determine how global patterns such as the jet stream and water currents influence local weather in measurable terms such as temperature, wind direction and speed, and precipitation.            9. Differentiate between weather and climate.</p>	<p><b><u><i>The Water Cycle, (Chapter 10, topic 6 ) and Weather, (Chapter 3, Weather)</i></u></b>  <b><u>Essential Questions:</u></b>            What is the water cycle?            What are the different processes of the water cycle and how are they all inter-related?            How does the weather cycle affect our lives?            What is the difference between weather and climate and what factors affect them?            What are the forms of precipitation which can be experienced in Massachusetts?            How does the water cycle affect our lives?            What factors contribute to the heating and cooling of the earth?            How does weather affect our lives?            What factors contribute to specific weather conditions?  <b><u>Key Vocabulary:</u></b>            Weather, climate, water cycle, evaporation, condensation, precipitation currents, altitude, air pressure, atmosphere insulation, angle of insolation, decomposition stratus, convection cell updraft, downdraft barometer, layers of the atmosphere, temperature thermometer, anemometer [relative] humidity, transpiration, cumulus</p>	<ul style="list-style-type: none"> <li>• Identify factors that affect temperature on earth</li> <li>• Explain how the atmosphere changes with elevation</li> <li>• Compare and contrast weather and climate</li> <li>• Diagram, label, and explain the water cycle and associated processes(evaporation , condensation, freezing, melting, subliming)</li> <li>• Identify which types of clouds are associated with various weather conditions</li> <li>• Identify the affect that ocean currents and larger bodies of water have on temperature and precipitation</li> <li>• Explain how air pressure is related to winds</li> <li>• List examples of forms of severe weather</li> <li>• Recognize how altitude affects weather</li> <li>• Identify conditions that affect climate; use a map to explain how the climate of Massachusetts / New England is affected by the Gulf Stream</li> <li>• Describe the “greenhouse effect”</li> <li>• Explain how Earth’s atmosphere acts as a form of insulation</li> <li>• Use a thermometer and a barometer to compare conditions indoor and outdoors.</li> </ul>	<p>Assessments will be comprised of, but not limited to the following:            Tests, both standards based and chapter review.            Homework            Oral responses,            Projects,            Open Response Questions,            Science Logs/Journals            Experiments, Problem Solving Activities, Student Demonstrations</p> <p>Suggested Activities:            Set up a weather Station and or establish a partnership with local weather station.            Chart: Gathering weather data using authentic instruments; charting results            Model: Make a model of or draw a diagram illustrating the water cycle            Make a model of an ocean current and the factors affecting it.            Design and build a terrarium to demonstrate the water cycle.</p>

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<p><b>Month(s) <u>November</u></b> <b><u>Standards</u></b> Gr. 3-5 Science Physical Science (Review)</p> <p>1. Differentiate between properties of objects (e.g., size, shape, weight) and properties of materials (e.g., color, texture, hardness).</p> <p>2. Compare and contrast solids, liquids, and gases based on the basic properties of each of these states of matter.</p> <p>3. Describe how water can be changed from one state to another by adding or taking away heat.</p>	<p><b><u>Properties of Objects and Materials and States of Matter, ( Chapter 7, Properties of Matter )</u></b></p> <p><b><u>Essential Questions:</u></b> What are the various properties of matter? How does matter change state? What is matter and how can it change? How are mass, volume and density related? Compare and contrast the properties of solids, liquids, and gases.</p> <p><b><u>Key Vocabulary:</u></b> Matter, volume, mass, density, physical change buoyancy, solid, liquid gas, energy, weight, conduct, insulate, element, compound, atom, proton, neutron, electron, nucleus, molecule, state of matter, melting point, boiling point, freezing point,</p>	<ul style="list-style-type: none"> <li>• Define <i>matter, volume, mass, weight, density</i></li> <li>• Identify and explore the properties of matter, especially states, mass, volume and density</li> <li>• Explain how manufacturers consider the properties of materials in designing new products, e.g., laptop computers are made of lightweight materials for ease in transportation</li> <li>• Describe how matter can change state; and state that this is an example of a <i>physical</i> change</li> <li>• Understand the role that heat energy plays in change of state, i.e., heat can be <u>added</u> or <u>taken away</u>.</li> <li>• Differentiate between weight and mass</li> <li>• Explain the relationship between mass, volume and density; and determine and compare the density of various solids,</li> <li>• liquids and gases</li> </ul>	<p>Assessments will be comprised of, but not limited to the following: Tests, both standards based and chapter review. Homework Oral responses, Projects, Open Response Questions, Science Logs/Journals Experiments, Problem Solving Activities, Student Demonstrations</p> <p>Suggested Activities:</p> <p>Design an investigation to compare the mass, density and volume of various objects Create a model or make a diagram of one of the elements, displaying, neutrons, protons and electrons. Given a set of objects, list the observable properties of each Given a matter sample, measure it with the appropriate tools to determine its quantity, mass, volume and density</p>

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	<p><b>Month(s) <u>December and January</u></b>  <b>Standards</b>            Gr. 3-5 Science            Physical Science            (Review)            4. Identify the basic forms of energy ( light, sound, heat, electrical, and magnetic ). Recognize that energy is the ability to cause motion or create change.            5. Give examples of how energy can be transferred from one form to another. (Add in)            11. Recognize that sound is produced by vibrating objects and requires a medium through which to travel. Relate the rate of vibration to the pitch of the sound.            12. Recognize that light travels in a straight line until it strikes an object or travels from one form to another, and that light can be reflected, refracted, and absorbed.  <b>Tech/Engineering</b>            1,1 Identify materials used to accomplish a design task based on a specific property.            1.2 Identify and explain the appropriate tools to construct a given prototype safely.            2.1 Identify a problem that reflects the need for shelter, storage or convenience.            2.2 describe different ways in which a problem can be represented.            2.3 Identify relevant design features for building a prototype of a solution to a given problem.</p>	<p><b><u>Sound Energy, (Chapter 5, Sound ) and Light Energy, (Chapter 6, Light)</u></b></p> <p><b><u>Essential Questions</u></b></p> <p>How do people perceive sounds?            How does pitch affect sound?            How does sound travel?            How is sound produced?            How does sound change?            How is the pitch and volume of sound changed and measured?            How do surfaces affect sound?            What is light and how does it travel?            Why does light travel through various mediums and not others?            What effect do surfaces have on light?            How is light made?            How can light be changed?</p> <p><b><u>Key Vocabulary</u></b>            Vibration, matter, sound waves, compression, pitch, hertz, decibel, volume, reflect, overtone, absorb, Doppler effect frequency, reflection, refraction, absorption, bioluminescence ,light ray, Law of Reflection, concave mirror, convex mirror, opaque, prism, transparent, primary color, primary pigment, translucent, spectrum, electromagnetism, laser, electromagnetic spectrum,</p>	<ul style="list-style-type: none"> <li>• Explain that sound is a form of energy and that it is produced by a vibration</li> <li>• Explain that sound travels as waves through matter</li> <li>• Compare and contrast the ways in which matter in its 3 states acts as a carrier of sound</li> <li>• Explain how sound is produced; distinguish between natural sources of sound and sound artificially produced by people</li> <li>• Differentiate between pitch and volume and investigate how they can be changed</li> <li>• Recognize that sounds can be reflected or absorbed</li> <li>• Identify light as a form of energy</li> <li>• Cite examples illustrating how energy can be transformed from one type to another, e.g., electricity to light and heat; solar to electrical, etc.</li> <li>• State that light travels in a straight line outward from its source</li> <li>• Define the terms <i>reflection, refraction, absorption</i> and cite instances when light can be reflected, refracted or absorbed</li> </ul>	<p>Assessments will be comprised of, but not limited to the following:            Tests, both standards based and chapter review.            Homework            Oral responses,            Projects,            Open Response Questions,            Science Logs/Journals            Experiments, Problem Solving Activities, Student Demonstrations</p> <p>Suggested Activities:</p> <p>Project: Design and build a musical instrument and use it to demonstrate how the pitch and volume of a sound can be changed            Design an investigation to explore how sound is produced.            Design an investigation to explore absorption and reflection.            Art: Draw a poster illustrating the effects of various surfaces (e.g., smooth, rough) on the reflectivity of light            Composition: Write a paragraph comparing and contrasting sound and light            Use a prism to show that white light can be broken down into the colors of the visible spectrum            Design and build a prototype to inhibit solar heating of a car.</p>

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Month(s)	<b><u>February and March</u></b>	<p><b><u>Characteristics of Plants and Animals, and Structures and Functions, and Energy and Living Things (Chapters 1, The Importance of Plants) and (Chapter 2, Plant Reproduction and Response)</u></b></p> <p><b><u>Essential Questions:</u></b>            What are the characteristics of living things?            What are the similarities and differences between plants and animals?            What are the parts of a plant and what are their functions?            What is the process of Photosynthesis?            How do plants reproduce?</p> <p><b><u>Key Vocabulary:</u></b>            Photosynthesis, respiration, vascular, nonvascular, fungus, protist, bacterium, chloroplast, chlorophyll, roots, leaves, stems, seeds, root cap, epidermis, xylem, phloem, transpiration, asexual reproduction, sexual reproduction, angiosperm, gymnosperm, conifer, monocot, dicot, ovary, pollination, embryo, fruit, response, stimulus, tropism, adaptation</p>	<ul style="list-style-type: none"> <li>Identify the basic parts of a plants describe their functions</li> <li>Compare and contrast plants to other living organisms</li> <li>Identify the two major plant groups, vascular and nonvascular</li> <li>Understand and explain the functions of roots, stems, and leaves</li> <li>Understand that green plants produce their own food; define and explain <i>photosynthesis</i></li> <li>Compare and contrast photosynthesis and respiration in green plants</li> <li>Identify the stages in the life cycle of a green plant</li> <li>Recognize that some green plants produce flowers while other do not; understand and explain the role of flowers in the life cycle of green plants</li> <li>Identify the parts of a flower and explain the role of each in reproduction</li> <li>Explain seed dispersal</li> <li>Understand how plants can be grown without seeds; grow a variety of green plants from cutting or roots</li> <li>Compare and contrast monocots and dicots</li> <li>Explain the type of information which can be gathered from tree rings</li> </ul>	<p>Assessments will be comprised of, but not limited to the following:            Tests, both standards based and chapter review.            Homework            Oral responses,            Projects,            Open Response Questions,            Science Logs/Journals            Experiments, Problem Solving Activities, Student Demonstrations</p> <p>Suggested Activities:            Observe various types of green plants and state ways in which they are alike and different            Poster illustrating photosynthesis and respiration            Poster illustrating a flower with all parts accurately labeled, accompanied by a description of the function of each part            Experiment: Design and conduct an experiment to determine under which conditions plants grow best; control the variables one at a time to accurately determine which has the greatest effect on plant growth and development</p>
	<p><b><u>Standards</u></b>            Gr. 3-5 Science            Life Science            1. Classify plants and animals according to the characteristics that they share.            2. Identify the structures in plants that are responsible for food production, support, water transport, reproduction, growth, and production.            3. Recognize that plants and animals go through predictable life cycles that include birth, growth, development, reproduction and death.            5. Differentiate between observed characteristics of plants and animals that are fully inherited and characteristics that are affected by the climate or environment.            9. Recognize that plant behaviors such as the seedlings' stem grow toward light and their roots grow downward in response to gravity. Recognize that many plants and animals can survive harsh environments because of seasonal behaviors.            11. Describe how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred within a food chain from producers (plants) to consumers to decomposers</p>			

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<p><b>Month(s) <u>March and April</u></b>  <b>2008Standards</b>            Gr.3-5 Life Science            6. Give examples of how inherited characteristics may change over time as adaptations to changes in the environment that enable organisms to survive.            7. Give examples of how changes in the environment have caused some plants and animals to die or move to new locations.            8. Describe how organisms meet some of their needs in an environment by using behaviors in response to information received from the environment. Recognize that some animal behaviors are instinctive and others are learned.            9. Recognize that plant behaviors such as the seedlings' stem grow toward light and their roots grow downward in response to gravity. Recognize that many plants and animals can survive harsh environments because of seasonal behaviors.            10. Give examples of how organisms can cause changes in their environment to ensure survival. Explain how some of these changes may affect the ecosystem.            11. Describe how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred within a food chain from producers to consumers decomposers</p>	<p><b><u><i>Adaptations of Living Things and Energy and Living Things, (Chapter 11, Ecosystems and Chapter 12, Living Things Interact)</i></u></b></p> <p><b><u>Essential Questions:</u></b></p> <p>What do you need to survive in your ecosystem?            What food chains exist in your ecosystem?            What is an ecosystem and what happens when changes occur?            What do living organisms need to survive?            How do organisms survive and interact in their ecosystem?            What is essential in a healthy ecosystem?</p> <p><b><u>Key Vocabulary:</u></b>            Ecosystem, interact environment, biome, food chain, food web, aquatic, extinct, adaptation, ecology, abiotic factor, biotic factor, population, community, habitat, niche, herbivore, carnivore, predator, prey, scavenger, omnivore, limiting factor, symbiosis, mutualism, parasitism, commensalisms, biome, taiga, tundra, desert, deciduous forest, tropical rain forest</p>	<ul style="list-style-type: none"> <li>• Understand that all organisms need certain things in order to survive (i.e., food, water, shelter, etc.) and that they find these in their environment</li> <li>• Define <i>ecosystem</i> as all the living and nonliving things in an environment and how they interact with one another</li> <li>• Explain that when a change occurs in an ecosystem, all parts of the ecosystem are affected, e.g., beavers building a dam across a stream (flooding, destruction of plant life); bees building a hive in a hollow tree (pollination)</li> <li>• Compare and contrast food chains and webs</li> <li>• Compare and contrast various biomes and aquatic ecosystems</li> </ul>	<p>Assessments will be comprised of, but not limited to the following:            Tests, both standards based and chapter review.            Homework            Oral responses,            Projects,            Open Response Questions,            Science Logs/Journals            Experiments, Problem Solving Activities, Student Demonstrations            Project: Create and maintain an ecosystem that will support a variety of living things, including at least two types of plants and one other type of living thing; observe the ecosystem daily and record data on any modifications needed to ensure the survival of the ecosystem            Art: Illustrate a food chain that exists in different parts of your playground            Research report on an extinct species referencing environmental causes of its disappearance.            Design an investigation to explore a simple food chain.</p>

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<p><b>Month(s) May</b> <b><u>Standards:</u></b></p> <p>Gr.3-5 Science and Technology/ Engineering</p> <p><b><u>REVIEW OF ALL STANDARDS</u></b></p> <p><b>Earth and Space Standards # 1 thru 15</b></p> <p><b>Life Science Standards # 1 thru 11</b></p> <p><b>Physical Sciences Standards # 1 thru 12</b></p> <p><b>Technology/ Engineering Standards # 1 thru 2</b></p>	<p><b><u>Earth and Space:</u></b></p> <p><b>Rocks and Their Properties, Soil, Weather, The Water Cycle, Earth's History, The Earth in the Solar System</b></p> <p><b><u>Life Science (Biology)</u></b></p> <p><b>Characteristics of Plants and Animals, Structures and Functions, Adaptations of Living Things, Energy and Living Things</b></p> <p><b><u>Physical Sciences (Chemistry and Physics)</u></b></p> <p><b>Properties of Objects and Materials, States of Matter, Forms of Energy, Electrical Energy, Magnetic Energy, Sound Energy, Light Energy</b></p> <p><b><u>Technology/ Engineering</u></b></p> <p><b>Materials and Tools, Engineering Design</b></p>	<ul style="list-style-type: none"> <li>• Demonstrate knowledge and understanding of all major concepts and information in the Learning Standards of the Massachusetts Science and Technology/Engineering Curriculum Frameworks (October 2006).</li> <li>• Students will be able to answer questions in a written format and then be able to explain the reasoning behind their answers.</li> <li>• Students will be able to identify errors and then correct their errors</li> </ul>	<p>MCAS type questions which includes Open response questions and Multiple Choice Questions. Questions should include diagrams, graphs, and pictures. Use actual MCAS test items from previous years.</p>

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<p><b>Month(s) <u>June</u></b></p> <p><b><u>Standards:</u></b></p> <p>Gr. 6-8 Science, Life Science ( Biology)</p> <p>6. Identify the general functions of the major systems of the human body ( Digestion, respiration, reproduction, circulation, excretion, protection from disease, and movement, control and coordination) and describe ways that these systems interact with each other.</p>	<p><b><u><i>Systems in Living Things, (Chapter 13, Blood and Air and Chapter 14, Using Food and Staying Fit )</i></u></b></p> <p><b><u>Essential Questions:</u></b></p> <p>What are the major systems of the Human Body?            How do the different systems of the human body work?            What are the major organs of the systems of the human body?            What can we do to stay fit and healthy?</p> <p><b><u>Key Vocabulary</u></b></p> <p>Systems, circulatory, digestive, blood, antibody, nutrients, respiration, diet, exercise</p>	<ul style="list-style-type: none"> <li>• Students will be able to identify major systems of the human body and organs of those systems.</li> <li>• Students will be able to correlate diet and exercise to staying fit and healthy</li> </ul>	<p><b>Student Activities:</b></p> <p>Poster showing the food pyramid            Exercise/Activity log</p>

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