



Delta Science Modules Grades K-8

Correlation with



Correlation of the New York Science, Mathematics, and Technology Content Standards and Performance Indicators to Delta Science Modules

K-8

The following is a correlation of the New York State Learning Standards for Mathematics, Science and Technology to the Delta Science Modules (DSM). This correlation lists representative examples of activities that address the elementary science content standards and their performance indicators. A citation does not necessarily reflect all of the activities from DSM that might address a particular standard.

Standard 1:

Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate to pose questions, seek answers, and develop solutions.

Mathematical Analysis

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>1. Abstraction and symbolic representation are used to communicate mathematically. Students:</p> <ul style="list-style-type: none"> use special mathematical notation and symbolism to communicate in mathematics and to compare and describe quantities, express relationships, and relate mathematics to their immediate environments. 	<p>Weather Watching Activity 2-3, 7 Amazing Air Activity 4-5 Length and Capacity Activity 5-6, 10-11 Weather Instruments Activity 1-3, 6 Measuring Activity 5-8 Solar System Activity 5-8 Dinosaurs and Fossils Activity 4</p>	<p>Pages 21-36, 61-68 Pages 35-49 Pages 37-48, 77-88 Pages 13-36, 51-57 Pages 37-63 Pages 43-72 Pages 35-40</p>
<p>2. Deductive and inductive reasoning are used to reach mathematical conclusions. Students:</p> <ul style="list-style-type: none"> use simple logical reasoning to develop conclusions, recognizing that patterns and relationships present in the environment assist them in reaching these conclusions. 	<p>Finding the Moon Activity 2 Using Your Senses Activity 2 Force and Motion Activity 2-5 Amazing Air Activity 4-5 Weather Instruments Activity 6 Solar System Activity 5-8 Dinosaurs and Fossils Activity 4, 6-7</p>	<p>Pages 21-28 Pages 23-30 Pages 23-55 Pages 35-49 Pages 51-57 Pages 43-72 Pages 35-40, 47-60</p>
<p>3. Critical thinking skills are used in the solution of mathematical problems. Students:</p> <ul style="list-style-type: none"> explore and solve problems generated from school, home, and community situations, using concrete objects or manipulative materials when possible. 	<p>Finding the Moon Activity 2 Plant and Animal Populations Activity 8-9 Amazing Air Activity 4-7 Force and Motion Activity 2-5 Solar System Activity 6, 8 Measuring Activity 13</p>	<p>Pages 21-28 Pages 77-93 Pages 35-68 Pages 22-55 Pages 51-58, 65-72 Pages 97-104</p>

Scientific Inquiry

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>1. The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing, creative process. Students:</p> <ul style="list-style-type: none"> ask “why” questions in attempts to seek greater understanding concerning objects and events they have observed and heard about. question the explanations they hear from others and read about, seeking clarification and comparing them with their own observations and understandings. develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed. 	<p>DSM modules are inquiry based and provide opportunity to develop explanations. See for example:</p> <p>Observing an Aquarium Activity 8-11</p> <p>Investigating Water Activity 7-11</p> <p>Soil Science Activity 7-12</p> <p>States of Matter Activity 7-11</p> <p>Water Cycle Activity 8-13</p> <p>Sound Activity 7-11</p> <p>Electrical Circuits Activity 9-12</p>	<p>Pages 79-116</p> <p>Pages 55-94</p> <p>Pages 59-114</p> <p>Pages 57-96</p> <p>Pages 69-114</p> <p>Pages 59-98</p> <p>Pages 71-94</p>
<p>2. Beyond the use of reasoning and consensus, scientific inquiry involves the testing of proposed explanations involving the use of conventional techniques and procedures and usually requiring considerable ingenuity. Students:</p> <ul style="list-style-type: none"> develop written plans for exploring phenomena or for evaluating explanations guided by questions or proposed explanations they have helped formulate. share their research plans with others and revise them based on their suggestions. carry out their plans for exploring phenomena through direct observation and through the use of simple instruments that permit measurements of quantities (e.g., length, 	<p>DSM modules provide the opportunity to test proposed explanations. See for example:</p> <p>Sunshine and Shadows Activity 8-11</p> <p>From Seed to Plant Activity 6-8</p> <p>Using Your Senses Activity 2</p> <p>Force and Motion Activity 3-5</p> <p>States of Matter Activity 7, 11</p> <p>Animal Behavior Activity 3-7</p> <p>Magnets Activity 2-4</p> <p>Food Chains and Webs Activity 2-3</p>	<p>Pages 65-88</p> <p>Pages 53-72</p> <p>Pages 23-30</p> <p>Pages 31-55</p> <p>Pages 57-63, 89-96</p> <p>Pages 19-52</p> <p>Pages 19-34</p> <p>Pages 23-37</p>

mass, volume, temperature, and time).		
<p>3. The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into phenomena. Students:</p> <ul style="list-style-type: none"> organize observations and measurements of objects and events through classification and the preparation of simple charts and tables. interpret organized observations and measurements, recognizing simple patterns, sequences, and relationships. share their findings with others and actively seek their interpretations and ideas. adjust their explanations and understandings of objects and events based on their findings and new ideas. 	<p>DSM modules are inquiry based and provide the opportunity to analyze data and observations. See for example:</p> <p>Investigating Water Activity 7-11</p> <p>From Seed to Plant Activity 6-8</p> <p>Plant and Animal Populations Activity 8-9</p> <p>Amazing Air Activity 4-5</p> <p>Weather Watching Activity 3</p> <p>Dinosaurs and Fossils Activity 5-7</p> <p>Weather Instruments Activity 6</p> <p>Powders and Crystals Activity 5-12</p>	<p>Pages 55-94</p> <p>Pages 53-72</p> <p>Pages 77-93</p> <p>Pages 35-49</p> <p>Pages 29-36</p> <p>Pages 41-60</p> <p>Pages 51-57</p> <p>Pages 35-93</p>

Engineering Design

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>1. Engineering design is an iterative process involving modeling and optimization finding the best solution within given constraints which is used to develop technological solutions to problems within given constraints. Students engage in the following steps in a design process:</p> <ul style="list-style-type: none"> describe objects, imaginary or real, that might be modeled or made differently and suggest ways in which the objects can be changed, fixed, or improved. investigate prior solutions and ideas from books, magazines, family, friends, 	<p>DSM modules provide the opportunity for students to engage in engineering design activities. See for example:</p> <p>Investigating Water Activity 5, Science Challenge Activity 5, Science, Technology, and Society</p> <p>Amazing Air Activity 12, Reinforcement</p> <p>States of Matter Activity 5</p> <p>Force and Motion Activity 12</p> <p>Sink or Float Activity 12</p> <p>Sound Activity 12</p>	<p>Page 46</p> <p>Page 46</p> <p>Page 107</p> <p>Pages 41-49</p> <p>Page 117</p> <p>Pages 97-103</p> <p>Pages 99-105</p>

<p>neighbors, and community members.</p> <ul style="list-style-type: none"> • generate ideas for possible solutions, individually and through group activity; apply age-appropriate mathematics and science skills; evaluate the ideas and determine the best solution; and explain reasons for the choices. • plan and build, under supervision, a model of the solution using familiar materials, processes, and hand tools. • discuss how best to test the solution; perform the test under teacher supervision; record and portray results through numerical and graphic means; discuss orally why things worked or didn't work; and summarize results in writing, suggesting ways to make the solution better. 		
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Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.

Information Systems

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>1. Information technology is used to retrieve, process, and communicate information and as a tool to enhance learning. students:</p> <ul style="list-style-type: none"> • use a variety of equipment and software packages to enter, process, display, and communicate information in different forms using text, tables, pictures, and sound. • telecommunicate a message to a distant location with teacher help. • access needed information from printed media, electronic data 	<p>All DSM III modules include a reader for student use with the module. Use of information/computer technology is encouraged.</p>	

bases, and community resources.		
2. Knowledge of the impacts and limitations of information systems is essential to its effective and ethical use. Students: <ul style="list-style-type: none"> describe the uses of information systems in homes, schools, and businesses. understand that computers are used to store personal information. demonstrate ability to evaluate information. 	Use of information/computer technology is encouraged.	
3. Information technology can have positive and negative impacts on society, depending upon how it is used. Students: <ul style="list-style-type: none"> describe the uses of information systems in homes and schools. demonstrate ability to evaluate information critically 	Use of information/computer technology is encouraged.	

Standard 3: Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.

NOTE: DSM is an inquiry approach to teaching science. In doing the activities in the science program, students have many opportunities to use mathematics concepts and skills. In addition to the opportunities to do mathematics in the investigations of DSM, each of the DSM modules also provide numerous math extensions on the Connections page at the end of each activity. In doing math extensions students solve math problems related to the science content being studied. Listed below are some of the investigations and activities that reinforce the teaching of this mathematics standard.

Mathematical Reasoning

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
1. Students use mathematical reasoning to analyze mathematical situations, make conjectures, gather evidence, and construct an argument. Students:	Sunshine and Shadows Activity 6-9 Properties Activity 6 Plant and Animal Populations	Pages 43-70 Pages 47-52

<ul style="list-style-type: none"> • use models, facts, and relationships to draw conclusions about mathematics and explain their thinking. • use patterns and relationships to analyze mathematical situations. • justify their answers and solution processes. • use logical reasoning to reach simple conclusions. 	Activity 8-9 Using Your Senses	Pages 77-93
	Activity 2 Amazing Air	Pages 23-30
	Activity 4-5 Force and Motion	Pages 35-49
	Activity 3-5 Dinosaurs and Fossils	Pages 31-55
	Activity 4, 6-7 Weather Instruments	Pages 35-40, 65-72
	Activity 6 Measuring	Pages 51-57
	Activity 12-13	Pages 87-104

Number and Numeration

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>2. Students use number sense and numeration to develop an understanding of the multiple uses of numbers in the real world, the use of numbers to communicate mathematically, and the use of numbers in the development of mathematical ideas.</p> <p>Students:</p> <ul style="list-style-type: none"> • use whole numbers and fractions to identify locations, quantify groups of objects, and measure distances. • use concrete materials to model numbers and number relationships for whole numbers and common fractions, including decimal fractions. • relate counting to grouping and to place-value. • recognize the order of whole numbers and commonly used fractions and decimals. • demonstrate the concept of percent through problems related to actual situations. 	<p>Force and Motion Activity 1-3</p> <p>Length and Capacity Activity 5-6, 10-11</p> <p>Amazing Air Activity 4-5</p> <p>Using Your Senses Activity 2</p> <p>Dinosaurs and Fossils Activity 6-8</p> <p>Solar System Activity 5-8</p> <p>Weather Instruments Activity 1-3</p> <p>Measuring Activity 3-8</p>	<p>Pages 13-39</p> <p>Pages 37-48, 77-88</p> <p>Pages 35-49</p> <p>Pages 23-30</p> <p>Pages 47-60</p> <p>Pages 43-72</p> <p>Pages 13-36</p> <p>Pages 21-63</p>

Operations

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
3. Students use mathematical operations and relationships	Weather Watching Activity 2	Pages 21-28

<p>among them to understand mathematics.</p> <p>Students:</p> <ul style="list-style-type: none"> • add, subtract, multiply, and divide whole numbers. • develop strategies for selecting the appropriate computational and operational method in problem-solving situations. • know single digit addition, subtraction, multiplication, and division facts. • understand the commutative and associative properties. 	<p>Amazing Air Activity 3</p> <p>Earth Movements Activity 6, Science and Math</p> <p>Solar System Activity 5-7</p> <p>Measuring Activity 4, 8</p> <p>Looking at Liquids Activity 8</p>	<p>Pages 25-33</p> <p>Page 61</p> <p>Pages 43-64</p> <p>Pages 29-35, 57-63</p> <p>Pages 57-62</p>
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Modeling/Multiple Representation

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>4. Students use mathematical modeling/multiple representation to provide a means of presenting, interpreting, communicating, and connecting mathematical information and relationships.</p> <p>Students:</p> <ul style="list-style-type: none"> • use concrete materials to model spatial relationships. • construct tables, charts, and graphs to display and analyze real-world data. • use multiple representations (simulations, manipulative materials, pictures, and diagrams) as tools to explain the operation of everyday procedures. • use variables such as height, weight, and hand size to predict changes over time. • use physical materials, pictures, and diagrams to explain mathematical ideas and processes and to demonstrate geometric concepts. 	<p>Sunshine and Shadows Activity 6-9</p> <p>Finding the Moon Activity 2</p> <p>Plant and Animal Populations Activity 8-9</p> <p>Amazing Air Activity 5</p> <p>Length and Capacity Activity 4</p> <p>Dinosaurs and Fossils Activity 6-7</p> <p>Weather Instruments Activity 6</p> <p>Solar System Activity 6, 8</p>	<p>Pages 49-76</p> <p>Pages 21-28</p> <p>Pages 77-93</p> <p>Pages 43-49</p> <p>Pages 27-36</p> <p>Pages 47-60</p> <p>Pages 51-57</p> <p>Pages 51-58, 65-72</p>

Measurement

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>5. Students use measurement in both metric and English measure to provide a major link between the abstractions of mathematics and the real world in order to describe and compare objects and data.</p> <p>Students:</p> <ul style="list-style-type: none"> understand that measurement is approximate, never exact. select appropriate standard and nonstandard measurement tools in measurement activities. understand the attributes of area, length, capacity, weight, volume, time, temperature, and angle. estimate and find measures such as length, perimeter, area, and volume using both nonstandard and standard units. collect and display data. use statistical methods such as graphs, tables, and charts to interpret data 	<p>Properties Activity 6-7</p> <p>Sink or Float Activity 6-7, 11</p> <p>Using Your Senses Activity 2</p> <p>Force and Motion Activity 1-5</p> <p>Length and Capacity Activity 1-12</p> <p>Dinosaurs and Fossils Activity 6-7</p> <p>Solar System Activity 6, 8</p> <p>Measuring Activity 1-13</p>	<p>Pages 47-60</p> <p>Pages 51-63, 89-96</p> <p>Pages 23-30</p> <p>Pages 13-55</p> <p>Pages 7-94</p> <p>Pages 47-60</p> <p>Pages 51-58, 63-72</p> <p>Pages 7-104</p>

Uncertainty

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>6. Students use ideas of uncertainty to illustrate that mathematics involves more than exactness when dealing with everyday situations.</p> <p>Students:</p> <ul style="list-style-type: none"> make estimates to compare to actual results of both formal and informal measurement. make estimates to compare to actual results of computations. recognize situations where only an estimate is required. develop a wide variety of estimation skills and 	<p>Properties Activity 6-7</p> <p>Sunshine and Shadows Activity 8-9</p> <p>Length and Capacity Activity 7, 12</p> <p>Dinosaurs and Fossils Activity 4, 7</p> <p>Small Things and Microscopes Activity 1</p> <p>Measuring Activity 2-3</p>	<p>Pages 47-60</p> <p>Pages 63-76</p> <p>Pages 49-57, 89-94</p> <p>Pages 35-40, 55-60</p> <p>Pages 7-11</p> <p>Pages 15-27</p>

<p>strategies.</p> <ul style="list-style-type: none"> • determine the reasonableness of results. • predict experimental probabilities. • make predictions using unbiased random samples. • determine probabilities of simple events. 		
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Patterns/Functions

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>7. Students use patterns and functions to develop mathematical power, appreciate the true beauty of mathematics, and construct generalizations that describe patterns simply and efficiently. Students:</p> <ul style="list-style-type: none"> • recognize, describe, extend, and create a wide variety of patterns. • represent and describe mathematical relationships. • explore and express relationships using variables and open sentences. • solve for an unknown using manipulative materials. • use a variety of manipulative materials and technologies to explore patterns. • interpret graphs. • explore and develop relationships among two- and three-dimensional geometric shapes. • discover patterns in nature, art, music, and literature. 	<p>Sunshine and Shadows Activity 5-7 Finding the Moon Activity 3-4, 9-10 Weather Watching Activity 3 Amazing Air Activity 4-5 Force and Motion Activity 3, 9 Dinosaurs and Fossils Activity 6-7 Solar System Activity 3-4</p>	<p>Pages 43-63 Pages 29-46, 77-91 Pages 29-36 Pages 35-49 Pages 31-39, 83-90 Pages 47-60 Pages 27-42</p>

Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.

Physical Setting

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>1. The Earth and celestial phenomena can be described by principles of relative motion and perspective.</p> <p>Students:</p> <ul style="list-style-type: none"> describe patterns of daily, monthly, and seasonal changes in their environment. 	<p>Finding the Moon Activity 2-4, 9-10 Reader</p> <p>Sunshine and Shadows Activity 6-7 Reader</p> <p>Weather Watching Activity 3 Activity 3, Science Challenge Reader</p> <p>Solar System Activity 1-2, 9 Reader</p>	<p>Pages 21-46, 77-91 Pages 6-10</p> <p>Pages 49-63 Pages 8-9</p> <p>Pages 29-36 Page 36 Pages 8-10</p> <p>Pages 13-26, 73-81 Pages 2-13</p>
<p>2. Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land</p> <p>Students:</p> <ul style="list-style-type: none"> describe the relationships among air, water, and land on Earth. 	<p>Investigating Water Activity 10-11 Reader</p> <p>Weather Watching Activity 6-7 Reader</p> <p>Soil Science Activity 5-6, 11-12 Reader</p> <p>Earth Movements Activity 3 Reader</p> <p>Water Cycle Activity 8-9, 11-13 Reader</p> <p>Weather Instruments Activity 11</p>	<p>Pages 81-94 Pages 8-11</p> <p>Pages 51-68 Pages 4-5, 11-12</p> <p>Pages 45-58, 99-114 Pages 4-6, 9</p> <p>Pages 29-37 Pages 4-5, 12-13</p> <p>Pages 69-76, 91-114 Pages 10-12</p> <p>Pages 89-96</p>
<p>3. Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.</p> <p>Students:</p> <ul style="list-style-type: none"> observe and describe properties of materials using appropriate tools. describe chemical and physical changes, including changes in states of matter. 	<p>Properties Activity 1-12 Reader</p> <p>Investigating Water Activity 1-5 Reader</p> <p>Amazing Air Activity 1-3</p> <p>Sink or Float Reader</p> <p>Soil Science Activity 1-7 Reader</p> <p>States of Matter Activity 1-5, 8-12 Reader</p> <p>Water Cycle</p>	<p>Pages 13-93 Pages 2-13, 15</p> <p>Pages 13-46 Pages 2-13</p> <p>Pages 7-33</p> <p>Pages 3-4</p> <p>Pages 15-67 Pages 2-8</p> <p>Pages 13-50, 65-101 Pages 2-12</p>

	Activity 8-9, 11-13 Reader Weather Instruments Activity 7, 9, 11 Looking at Liquids Activity 1-3, 8, 11-12 Magnets Activity 2 Powders and Crystals Activity 2-9	Pages 69-83, 91-114 Pages 8-12 Pages 59-66, 75-80, 89-96 Pages 7-28, 57-62, 77-90 Pages 9-23 Pages 13-69
4. Energy exists in many forms, and when these forms change energy is conserved. Students: <ul style="list-style-type: none"> describe a variety of forms of energy (e.g., heat, chemical, light) and the changes that occur in objects when they interact with those forms of energy. observe the way one form of energy can be transformed into another form of energy present in common situations (e.g., mechanical to heat energy, mechanical to electrical energy, chemical to heat energy). 	Weather Watching Activity 4-5, 8-10 States of Matter Activity 4-8 Force and Motion Activity 1-8 Reader Electrical Circuits Activity 1-13 Reader Magnets Activity 1-5 Reader Sound Activity 2, 12 Reader	Pages 37-50, 69-100 Pages 35-72 Pages 13-82 Pages 2-8 Pages 13-94 Pages 2-11 Pages 13-40 Pages 2-12 Pages 21-28, 99-105 Pages 2-7, 12-13
5. Energy and matter interact through forces that result in changes in motion. Students: <ul style="list-style-type: none"> describe the effects of common forces (pushes and pulls) on objects, such as those caused by gravity, magnetism, and mechanical forces. describe how forces can operate across distances. 	Properties Activity 9-11 Amazing Air Activity 5, 10-12 Weather Watching Activity 5 Force and Motion Activity 1-12 Reader Sink or Float Activity 1-5 Solar System Activity 2 Reader Sound Activity 9-11 Earth Movements Activity 4 Magnets Activity 1-2 Reader Weather Instruments Activity 4-5	Pages 75-86 Pages 43-49, 87-108 Pages 45-50 Pages 13-117 Pages 2-15 Pages 13-51 Pages 21-26 Page 2 Pages 73-98 Pages 39-46 Pages 13-23 Pages 2-10 Pages 37-50

The Living Environment

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>1. Living things are both similar to and different from each other and nonliving things.</p> <p>Students:</p> <ul style="list-style-type: none"> describe the characteristics of and variations between living and nonliving things. describe the life processes common to all living things. 	<p>Observing an Aquarium Activity 3-6, 10 Reader</p> <p>From Seed to Plant Activity 1-2 Reader</p> <p>Butterflies and Moths Activity 1-2, 4-6, 9, 11-12 Reader</p> <p>Classroom Plants Activity 1-3, 5-9 Reader</p> <p>Food Chains and Webs Activity 2-6</p> <p>Insect Life Activity 1, 2, 5</p> <p>Plant and Animal Life Cycles Activity 1, 4-5, 11</p> <p>Dinosaurs and Fossils Reader</p>	<p>Pages 31-67, 97-107 Pages 4-12</p> <p>Pages 15-96 Pages 2-9</p> <p>Pages 15-30, 39-59, 79-87, 91-110 Pages 2-7</p> <p>Pages 15-37, 47-86 Pages 2-3</p> <p>Pages 23-58</p> <p>Pages 7-22, 35-39</p> <p>Pages 15-24, 43-56, 97-103</p> <p>Pages 6-11</p>
<p>2. Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring.</p> <p>Students:</p> <ul style="list-style-type: none"> recognize that traits of living things are both inherited and acquired or learned. recognize that for humans and other living things there is genetic continuity between generations. 	<p>Observing an Aquarium Activity 10</p> <p>Plant and Animal Populations Activity 5-6</p> <p>Butterflies and Moths Activity 1, 6, 9, 11 Reader</p> <p>Plant and Animal Life Cycles Activity 9-10 Reader</p>	<p>Pages 97-107</p> <p>Pages 51-67</p> <p>Pages 15-21, 53-59, 79-87, 91-104 Pages 3-5, 13</p> <p>Pages 83-96 Pages 2, 10, 12</p>
<p>3. Individual organisms and species change over time.</p> <p>Students:</p> <ul style="list-style-type: none"> describe how the structures of plants and animals complement the environment of the plant or animal. observe that differences within a species may give individuals an advantage in surviving and reproducing. 	<p>Observing an Aquarium Activity 3-5 Reader</p> <p>From Seed to Plant Activity 9-10 Reader</p> <p>Plant and Animal Populations Activity 4-7, 10-11 Reader</p> <p>Butterflies and Moths Activity 10</p> <p>Dinosaurs and Fossils Activity 8 Reader</p> <p>Food Chains and Webs Activity 4-6</p> <p>Insect Life Activity 9, 12</p>	<p>Pages 31-55 Pages 6-9</p> <p>Pages 73-84 Pages 3-4, 10, 14-15</p> <p>Pages 43-76, 95-110 Pages 5-7, 11</p> <p>Pages 89-95</p> <p>Pages 61-66 Pages 2-11</p> <p>Pages 39-58</p> <p>Pages 61-66, 79-83</p>

<p>4. The continuity of life is sustained through reproduction and development. Students:</p> <ul style="list-style-type: none"> describe the major stages in the life cycles of selected plants and animals. describe evidence of growth, repair, and maintenance, such as nails, hair, and bone, and the healing of cuts and bruises. 	<p>Observing an Aquarium Activity 10 Reader</p> <p>From Seed to Plant Activity 13 Reader</p> <p>Butterflies and Moths Activity 1, 6, 9, 11 Reader</p> <p>Plant and Animal Populations Activity 5-6</p> <p>Classroom Plants Reader</p> <p>Insect Life Activity 2, 7</p> <p>Plant and Animal Life Cycles Activity 9-10 Reader</p>	<p>Pages 97-107 Pages 10-11</p> <p>Pages 97-103 Pages 10-11</p> <p>Pages 15-21, 53-59, 79-67, 97-104 Pages 3, 8-13</p> <p>Pages 51-67</p> <p>Page 5</p> <p>Pages 15-22, 47-54</p> <p>Pages 83-96 Pages 2-13</p>
<p>5. Organisms maintain a dynamic equilibrium that sustains life. Students:</p> <ul style="list-style-type: none"> describe basic life functions of common living specimens (guppy, mealworm, gerbil). describe some survival behaviors of common living specimens. describe the factors that help promote good health and growth in humans. 	<p>Observing an Aquarium Activity 2, 5 Reader</p> <p>From Seed to Plant Reader</p> <p>Butterflies and Moths Activity 3, 7-8 Reader</p> <p>Classroom Plants Activity 5, 8</p> <p>Plant and Animal Populations Reader</p> <p>Insect Life Activity 11</p> <p>Food Chains and Webs Activity 2-3, 5</p>	<p>Pages 23-30, 47-55 Pages 7-9</p> <p>Pages 6-9, 14-15</p> <p>Pages 31-38, 61-77 Page 15</p> <p>Pages 47-53, 73-79</p> <p>Pages 5-7</p> <p>Pages 73-78</p> <p>Pages 23-37, 47-52</p>
<p>6. Plants and animals depend on each other and their physical environment. Students:</p> <ul style="list-style-type: none"> describe how plants and animals, including humans, depend upon each other and the nonliving environment. describe the relationship of the sun as an energy source for living and nonliving cycles. 	<p>Observing an Aquarium Activity 7 Reader</p> <p>Butterflies and Moths Activity 7-8</p> <p>Classroom Plants Activity 3, 5, 8 Reader</p> <p>Plant and Animal Populations Activity 10-12 Reader</p> <p>Insect Life Activity 10</p> <p>Food Chains and Webs Activity 2-3, 10-12 Reader</p>	<p>Pages 69-78 Pages 9-12</p> <p>Pages 61-71</p> <p>Pages 29-37, 47-53, 73-79 Pages 2-3, 9</p> <p>Pages 95-117 Pages 4, 12-13</p> <p>Pages 67-71</p> <p>Pages 23-37, 81-101 Pages 4-9</p>
<p>7. Human decisions and activities have had a profound impact on the physical and living environment. Students:</p>	<p>Observing an Aquarium Activity 11</p> <p>Plant and Animal Populations Reader</p>	<p>Pages 109-116</p> <p>Page 15</p>

<ul style="list-style-type: none"> identify ways in which humans have changed their environment and the effects of those changes. 	<p>Soil Science Activity 10, Science and Social Studies Activity 11, Science and Social Studies Reader</p> <p>Insect Life Activity 13, Science and Social Studies</p> <p>Food Chains and Webs Activity 12, Science, Technology, and Society Reader</p>	<p>Page 97</p> <p>Page 114 Pages 10-12</p> <p>Page 89</p> <p>Page 101 Page 12</p>
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Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.

Engineering Design

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>1. Engineering design is an iterative process involving modeling and optimization used to develop technological solutions to problems within given constraints.</p> <p>Students:</p> <ul style="list-style-type: none"> describe objects, imaginary or real, that might be modeled or made differently and suggest ways in which the objects can be changed, fixed, or improved. investigate prior solutions and ideas from books, magazines, family, friends, neighbors, and community members. generate ideas for possible solutions, individually and through group activity; apply age-appropriate mathematics and science skills; evaluate the ideas and determine the best solution; and explain reasons for the choices. plan and build, under supervision, a model of the solution using familiar materials, processes, and hand tools. 	<p>DSM modules provide the opportunity for students to engage in engineering design activities.</p> <p>See for example:</p> <p>Investigating Water Activity 5, Science Challenge Activity 5, Science, Technology, and Society</p> <p>Amazing Air Activity 12, Reinforcement</p> <p>States of Matter Activity 5</p> <p>Force and Motion Activity 12, Science Challenge</p> <p>Sink or Float Activity 12</p> <p>Sound Activity 12</p>	<p>Page 46</p> <p>Page 46</p> <p>Page 107</p> <p>Pages 41-49</p> <p>Page 117</p> <p>Pages 97-103</p> <p>Pages 99-105</p>

<ul style="list-style-type: none"> discuss how best to test the solution; perform the test under teacher supervision; record and portray results through numerical and graphic means; discuss orally why things worked or didn't work; and summarize results in writing, suggesting ways to make the solution better. 		
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Tools, Resources, Technological Processes

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>2. Technological tools, materials, and other resources should be selected on the basis of safety, cost, availability, appropriateness, and environmental impact; technological processes change energy, information, and material resources into more useful forms.</p> <p>Students:</p> <ul style="list-style-type: none"> explore, use, and process a variety of materials and energy sources to design and construct things. understand the importance of safety, cost, ease of use, and availability in selecting tools and resources for a specific purpose. develop basic skill in the use of hand tools. use simple manufacturing processes (e.g., assembly, multiple stages of production, quality control) to produce a product. use appropriate graphic and electronic tools and techniques to process information. 	<p>Investigating Water Activity 5, Science Challenge</p> <p>States of Matter Activity 5</p> <p>Force and Motion Activity 12, Science Challenge</p> <p>Sink or Float Activity 12</p> <p>Sound Activity 12</p>	<p>Page 46</p> <p>Pages 41-49</p> <p>Page 117</p> <p>Pages 97-103</p> <p>Pages 99-105</p>

Computer Technology

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>3. Computers, as tools for design, modeling, information processing, communication, and system control, have greatly increased human productivity and knowledge.</p> <p>Students:</p> <ul style="list-style-type: none"> • identify and describe the function of the major components of a computer system. • use the computer as a tool for generating and drawing ideas. • control computerized devices and systems through programming. • model and simulate the design of a complex environment by giving direct commands. 	Use of computer technology is encouraged.	

Technological Systems

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>4. Technological systems are designed to achieve specific results and produce outputs, such as products, structures, services, energy, or other systems.</p> <p>Students:</p> <ul style="list-style-type: none"> • identify familiar examples of technological systems that are used to satisfy human needs and wants, and select them on the basis of safety, cost, and function. • assemble and operate simple technological systems, including those with interconnecting mechanisms to achieve different kinds of movement. • understand that larger systems are made up of smaller component subsystems. 	<p>Investigating Water Activity 12</p> <p>States of Matter Activity 12</p> <p>Force and Motion Activity 6-8, 12</p> <p>Small Things and Microscopes Activity 3-5</p> <p>Electrical Circuits Activity 3-4, 9-11 Reader</p> <p>Magnets Activity 11 Reader</p>	<p>Pages 95-100</p> <p>Pages 97-101</p> <p>Pages 57-82, 11-117</p> <p>Pages 19-35</p> <p>Pages 27-43, 71-88 Pages 10-11</p> <p>Pages 71-76 Pages 11, 15</p>

History and Evolution of Technology

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>5. Technology has been the driving force in the evolution of society from an agricultural to an industrial to an information base.</p> <p>Students:</p> <ul style="list-style-type: none"> identify technological developments that have significantly accelerated human progress. 	<p>Amazing Air Activity 12, Science and Social Studies</p> <p>Electrical Circuits Reader</p> <p>Solar System Activity 1, Science, Technology, and Society Activity 2, Science, Technology, and Society Reader</p> <p>Magnets Activity 3, Science, Technology, and Society Reader</p> <p>Water Cycle Activity 3, Science, Technology, and Society Activity 9, Science, Technology, and Society Reader</p>	<p>Page 108</p> <p>Pages 10-11</p> <p>Page 20</p> <p>Page 26 Page 15</p> <p>Page 28 Pages 14-15</p> <p>Page 37</p> <p>Page 83 Pages 14-15</p>

Impacts of Technology

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>6. Technology can have positive and negative impacts on individuals, society, and the environment and humans have the capability and responsibility to constrain or promote technological development.</p> <p>Students:</p> <ul style="list-style-type: none"> describe how technology can have positive and negative effects on the environment and on the way people live and work. 	<p>Amazing Air Activity 12, Science and Social Studies</p> <p>Plant and Animal Populations Activity 7, Science, Technology and Society</p> <p>Food Chains and Webs Activity 12, Science, Technology and Society</p> <p>Magnets Activity 4, Science, Technology and Society Activity 10, Science and Health Reader</p> <p>Water Cycle Activity 3, Science, Technology and Society Activity 7, Science, Technology and Society Reader</p>	<p>Page 108</p> <p>Page 76</p> <p>Pages 101</p> <p>Pages 34</p> <p>Page 70 Pages 14-15</p> <p>Page 37</p> <p>Page 67 Pages 14-15</p>

Management of Technology

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>7. Project management is essential to ensuring that technological endeavors are profitable and that products and systems are of high quality and built safely, on schedule, and within budget. Students:</p> <ul style="list-style-type: none"> participate in small group projects and in structured group tasks requiring planning, financing, production, quality control, and follow-up. speculate on and model possible technological solutions that can improve the safety and quality of the school or community environment. 		

Standard 6: Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning.

System Thinking

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>2. Through systems thinking, people can recognize the commonalities that exist among all systems and how parts of a system interrelate and combine to perform specific functions. Students:</p> <ul style="list-style-type: none"> observe and describe interactions among components of simple systems. identify common things that can be considered to be systems (e.g., a plant population, a subway system, human beings). 	<p>Investigating Water Activity 12 Sunshine and Shadows Activity 11-12 Observing an Aquarium Reader Amazing Air Activity 5-6 Classroom Plants Activity 6-9 Reader Using Your Senses Activity 1, 5 Reader Force and Motion Activity 6-8 Solar System Activity 1-2, 9 Electric Circuits Activity 1, 3-4, 9-12 Reader Magnets Activity 11</p>	<p>Pages 95-100 Pages 83-95 Pages 2-3 Pages 43-57 Pages 55-86 Page 6 Pages 13-21, 45-52 Pages 4-7, 11 Pages 57-73 Pages 13-26, 73-81 Pages 13-17, 27-43, 71-101 Pages 10-11 Pages 71-76</p>

	Reader	Pages 10-11
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Models

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>2. Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.</p> <p>Students:</p> <ul style="list-style-type: none"> analyze, construct, and operate models in order to discover attributes of the real thing. discover that a model of something is different from the real thing but can be used to study the real thing. use different types of models, such as graphs, sketches, diagrams, and maps, to represent various aspects of the real world. 	<p>Finding the Moon Activity 2, 7, 9</p> <p>Weather Watching Activity 9</p> <p>Plant and Animal Populations Activity 8</p> <p>Force and Motion Activity 6-11</p> <p>Soil Science Activity 6, 12</p> <p>Insect Life Activity 1, 6, 9</p> <p>Solar System Activity 6, 8</p> <p>Electric Circuits Activity 10-11</p> <p>Earth Movements Activity 6-10</p> <p>Water Cycles Activity 9, 11, 13</p>	<p>Pages 21-28, 63-69, 85-91</p> <p>Pages 77-86</p> <p>Pages 77-83</p> <p>Pages 57-109</p> <p>Pages 51-58, 107-114</p> <p>Pages 7-13, 61-66</p> <p>Pages 51-58, 65-72</p> <p>Pages 77-88</p> <p>Pages 55-96</p> <p>Pages 77-83, 91-98, 107-114</p>

Magnitude and Scale

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>3. The grouping of magnitudes of size, time, frequency, and pressures or other units of measurement into a series of relative order provides a useful way to deal with the immense range and the changes in scale that affect the behavior and design of systems.</p> <p>Students:</p> <ul style="list-style-type: none"> provide examples of natural and manufactured things that belong to the same category yet have very different sizes, weights, ages, speeds, and other measurements. identify the biggest and the smallest values as well as the average value of a system when given information about its characteristics and behavior. 	<p>Finding the Moon Activity 2</p> <p>Amazing Air Activity 4-5</p> <p>Force and Motion Activity 7</p> <p>States of Matter Activity 7, 11</p> <p>Dinosaurs and Fossils Activity 4</p> <p>Solar System Activity 5-8</p> <p>Measuring Activity 11-12</p>	<p>Pages 21-28</p> <p>Pages 35-49</p> <p>Pages 65-72</p> <p>Pages 57-63, 89-96</p> <p>Pages 35-40</p> <p>Pages 45-72</p> <p>Pages 79-95</p>

Equilibrium and Stability

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>4. Equilibrium is a state of stability due either to a lack of changes (static equilibrium) or a balance between opposing forces (dynamic equilibrium). Students:</p> <ul style="list-style-type: none"> • cite examples of systems in which some features stay the same while other features change. • distinguish between reasons for stability—from lack of changes to changes that counterbalance one another to changes within cycles. 	<p>Properties Activity 6 Amazing Air Activity 6 Force and Motion Activity 3 Sink or Float Activity 1-6 Earth Movements Activity 6-9 Water Cycle Activity 13</p>	<p>Pages 47-62 Pages 51-57 Pages 31-57 Pages 13-59 Pages 55-85 Pages 107-114</p>

Patterns of Change

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>5. Identifying patterns of change is necessary for making predictions about future behavior and conditions. Students:</p> <ul style="list-style-type: none"> • use simple instruments to measure such quantities as distance, size, and weight and look for patterns in the data. • analyze data by making tables and graphs and looking for patterns of change. 	<p>Sunshine and Shadows Activity 6-7 From Seed to Plant Activity 7 Find the Moon Activity 9-10 Soil Science Activity 2 Plant and Animal Populations Activity 8-9 Weather Watching Activity 3 Weather Instruments Activity 6 Solar System Activity 9 Measuring Activity 11-13</p>	<p>Pages 49-63 Pages 59-66 Pages 77-91 Pages 21-27 Pages 77-93 Pages 29-36 Pages 51-57 Pages 73-81 Pages 79-104</p>

Optimization

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>6. In order to arrive at the best solution that meets criteria within constraints, it is often necessary to make trade-offs. Students:</p> <ul style="list-style-type: none"> • determine the criteria and 	<p>Investigation Water Activity 12 Force and Motion Activity 3, 6, 8-11 Sink or Float Activity 9-12</p>	<p>Pages 95-100 Pages 31-39, 57-64, 73-109 Pages 75-107</p>

<p>constraints of a simple decision making problem.</p> <ul style="list-style-type: none"> • use simple quantitative methods, such as ratios, to compare costs to benefits of a decision problem. 	<p>Sound Activity 12 Measuring Activity 13</p>	<p>Pages 99-105 Pages 97-104</p>
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Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.

Connections

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>1. The knowledge and skills of mathematics, science, and technology are used together to make informed decisions and solve problems, especially those relating to issues of science/technology/society, consumer decision making, design, and inquiry into phenomena. Students:</p> <ul style="list-style-type: none"> • analyze science/technology/society problems and issues that affect their home, school, or community, and carry out a remedial course of action. • make informed consumer decisions by applying knowledge about the attributes of particular products and making cost/benefit tradeoffs to arrive at an optimal choice. • design solutions to problems involving a familiar and real context, investigate related science concepts to inform the solution, and use mathematics to model, quantify, measure, and compute. • observe phenomena and evaluate them scientifically and mathematically by conducting a fair test of the effect of variables and 	<p>Observing an Aquarium Activity 11 Investigating Water Activity 12 Sink or Float Activity 9-12 Amazing Air Activity 12 Force and Motion Activity 4-5 Soil Science Activity 10-12 Insect Life Activity 13 Powders and Crystals Activity 10 Sound Activity 12</p>	<p>Pages 109-116 Pages 95-100 Pages 80-107 Pages 101-108 Pages 41-55 Pages 91-114 Pages 85-89 Pages 71-78 Pages 99-105</p>

using mathematical knowledge and technological tools to collect, analyze, and present data and conclusions.		
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Strategies

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>2. Solving interdisciplinary problems involves a variety of skills and strategies, including effective work habits; gathering and processing information; generating and analyzing ideas; realizing ideas; making connections among the common themes of mathematics, science, and technology; and presenting results.</p> <p>Students participate in an extended, culminating mathematics, science, and technology project. The project would require students to:</p> <ul style="list-style-type: none"> • work effectively • gather and process information generate and analyze ideas • observe common themes • realize ideas • present results 	<p>Sink or Float Activity 12</p> <p>Force and Motion Activity 12</p> <p>Powders and Crystals Activity 1, 12</p> <p>Sound Activity 12</p>	<p>Pages 97-107</p> <p>Pages 111- 117</p> <p>Pages 71-78, 82-93</p> <p>Pages 99-105</p>

Middle School Grades 5-8

Standard 1:

Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate to pose questions, seek answers, and develop solutions.

Mathematical Analysis

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>1. Abstraction and symbolic representation are used to communicate mathematically. Students:</p> <ul style="list-style-type: none"> extend mathematical notation and symbolism to include variables and algebraic expressions in order to describe and compare quantities and express mathematical relationships. 	<p>Simple Machines Activity 1, 3, 8 Flight and Rocketry Activity 8-9 Electromagnetism Activity 3, Science and Math Newton's Toy Box Activity 7-9 Matter and Change Activity 1-2 Famous Scientists Activity 2 If Shipwrecks Could Talk Activity 4</p>	<p>Pages 13-18, 25-31, 65-69 Pages 81-97 Page 29 Pages 39-54 Pages 7-21 Pages 21-28 Pages 35-45</p>
<p>2. Deductive and inductive reasoning are used to reach mathematical conclusions. Students:</p> <ul style="list-style-type: none"> use inductive reasoning to construct, evaluate and validate conjectures and arguments, recognizing that patterns and relationships can assist in explaining and extending mathematical phenomena. 	<p>Simple Machines Activity 3, 8 Flight and Rocketry Activity 8-9 Electromagnetism Activity 6 Erosion Activity 10, Science and Math Newton's Toy Box Activity 7-9 Famous Scientists Activity 2, 7 Matter and Change Activity 1-2</p>	<p>Pages 25-31, 65-69 Pages 81-97 Pages 43-48 Page 89 Pages 39-54 Pages 21-28, 65-75 Pages 7-21</p>
<p>3. Critical thinking skills are used in the solution of mathematical problems. Students:</p> <ul style="list-style-type: none"> apply mathematical knowledge to solve real-world problems and problems that arise from the investigation of mathematical ideas, using representations such as pictures, charts and tables. 	<p>You and Your Body Activity 3 Simple Machines Activity 1, 3, 8 Flight and Rocketry Activity 8-9 Oceans Activity 4, Science and Math Newton's Toy Box Activity 7-9 Famous Scientists Activity 2, 7-8 Matter and Change Activity 1-2</p>	<p>Pages 27-31 Pages 13-18, 25-31, 65-69 Pages 81-97 Page 54 Pages 39-54 Pages 21-28, 65-84 Pages 7-21</p>

Scientific Inquiry

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>1. The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing, creative process. Students:</p> <ul style="list-style-type: none"> • formulate questions independently with the aid of references appropriate for guiding the search for explanations of everyday observations. • construct explanations independently for natural phenomena especially by proposing preliminary visual models of phenomena.. • represent, present, and defend their proposed explanations of everyday observations so that they can be understood and assessed by others. • seek to clarify, to assess critically, and reconcile with their own thinking the ideas presented by others, including peers, teachers, authors, and scientists. 	<p>DSM modules are inquiry based and students ask questions to develop explanations for natural phenomena. See for example:</p> <p>Color and Light Activity 2-5</p> <p>Oceans Activity 6-8</p> <p>Erosion Activity 5-7</p> <p>Pollution Activity 4-10</p> <p>Plants in Our World Activity 3-6</p> <p>Newton’s Toy Box Activity 10-13</p> <p>Famous Scientists Activity 5, 7</p> <p>Matter and Change Activity 11-13</p>	<p>Pages 19-52</p> <p>Pages 65-98</p> <p>Pages 43-66</p> <p>Pages 31-76</p> <p>Pages 19-41</p> <p>Pages 55-70</p> <p>Pages 45-54, 65-75</p> <p>Pages 81-87</p>
<p>2. Beyond the use of reasoning and consensus, scientific inquiry involves the testing of proposed explanations involving the use of conventional techniques and procedures and usually requiring considerable ingenuity. Students:</p> <ul style="list-style-type: none"> • use conventional techniques and those of their own design to make further observations and refine their explanations, guided by a need for more information. 	<p>DSM modules are inquiry based and students test proposed explanations. See for example:</p> <p>Solar Energy Activity 3-6</p> <p>Color and Light Activity 2-5</p> <p>Erosion Activity 10-13</p> <p>Pollution Activity 6-10</p> <p>Pond Life Activity 12</p> <p>Plants in Our World Activity 3-6</p>	<p>Pages 21-46</p> <p>Pages 19-52</p> <p>Pages 83-104</p> <p>Pages 47-76</p> <p>Pages 81-86</p> <p>Pages 19-41</p>

<ul style="list-style-type: none"> develop, present, and defend formal research proposals for testing their own explanations of common phenomena, including ways of obtaining needed observations and ways of conducting simple controlled experiments. carry out their research proposals, recording observations and measurements (e.g., lab notes, audio tapes, computer disk, video tape) to help assess the explanation. 	<p>Newton's Toy Box Activity 7-9</p> <p>Matter and Change Activity 11-13</p> <p>Famous Scientists Activity 7, 10</p>	<p>Pages 39-54</p> <p>Pages 81-97</p> <p>Pages 65-75, 95-103</p>
<p>3. The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into phenomena. Students:</p> <ul style="list-style-type: none"> design charts, tables, graphs and other representations of observations in conventional and creative ways to help them address their research question and hypothesis. interpret the organized data to answer the research question or hypothesis and to gain insight into the problem. modify their personal understanding of phenomena based on evaluation of their hypothesis. 	<p>DSM modules are inquiry bases and provide the opportunity for students to make insightful observations. See for example:</p> <p>Electromagnetism Activity 6</p> <p>Solar Energy Activity 2-8</p> <p>You and Your Body Activity 3, 5</p> <p>Oceans Activity 4</p> <p>Famous Scientists Activity 7</p> <p>If Shipwrecks Could Talk Activity 2</p> <p>Newton's Toy Box Activity 7-9</p> <p>Electrical Connections Activity 9</p>	<p>Pages 43-48</p> <p>Pages 13-58</p> <p>Pages 27-31, 41-48</p> <p>Pages 43-54</p> <p>Pages 65-75</p> <p>Pages 19-25</p> <p>Pages 39-54</p> <p>Pages 59-64</p>

Engineering Design

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>1. Engineering design is an iterative process involving modeling and optimization finding the best solution within given constraints which is used to develop technological solutions to problems within given constraints.</p>	<p>DSM modules provide the opportunity for students to develop technological solutions to problems. See for example:</p> <p>Oceans Activity 10, Science Challenge</p> <p>Lenses and Mirrors</p>	<p>Page 124</p>

<p>Students engage in the following steps in a design process:</p> <ul style="list-style-type: none"> • identify needs and opportunities for technical solutions from an investigation of situations of general or social interest. • locate and utilize a range of printed, electronic, and human information resources to obtain ideas. • consider constraints and generate several ideas for alternative solutions, using group and individual ideation techniques (group discussion, brainstorming, forced connections, role play); defer judgment until a number of ideas have been generated; evaluate (critique) ideas; and explain why the chosen solution is optimal. • develop plans, including drawings with measurements and details of construction, and construct a model of the solution, exhibiting a degree of craftsmanship. • in a group setting, test their solution against design specifications, present and evaluate results, describe how the solution might have been modified for different or better results, and discuss tradeoffs that might have to be made. 	<p>Activity 12 Simple Machines Activity 12, Science Challenge Solar Energy Activity 11-12 Activity 11, Science Challenge Flight and Rocketry Activity 5, Reinforcement If Shipwrecks Could Talk Activity 4 Activity 4, Science Extension Electrical Connections Activity 12, Science Challenge Newton's Toy Box Activity 10, Science Challenge</p>	<p>Pages 89-94 Page 94 Pages 71082 Page 76 Page 63 Pages 35-45 Page 45 Page 81 Page 58</p>
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Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.

Information Systems

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>1. Information technology is used to retrieve, process, and communicate information and as a tool to enhance learning. Students:</p>	<p>Use of information systems/computers is encouraged.</p>	

<ul style="list-style-type: none"> • use a range of equipment and software to integrate several forms of information in order to create good quality audio, video, graphic, and text-based presentations. • use spreadsheets and date-base software to collect, process, display, and analyze information. Students access needed information from electronic data bases and on-line telecommunication services. • systematically obtain accurate and relevant information pertaining to topic from a range of sources, including local and national media, libraries, museums, governmental agencies, industries, and individuals. • collect data from probes to measure events and phenomena. • use simple modeling programs to make predictions. 		
<p>2. Knowledge of the impacts and limitations of information systems is essential to its effective and ethical use. Students:</p> <ul style="list-style-type: none"> • understand the need to question the accuracy of information displayed on a computer because the results produced by a computer may be affected by incorrect data entry. • identify advantages and limitations of data-handling programs and graphics programs. • understand why electronically stored personal information has greater potential for misuse than records kept in conventional form. 	<p>Use of information systems/computers is encouraged.</p>	
<p>3. Information technology can have positive and negative impacts on society, depending upon how it is used. Students:</p>	<p>Use of information systems/computers is encouraged.</p>	

<ul style="list-style-type: none"> • use graphical, statistical and presentation software to present project to fellow classmates • describe applications of information technology in mathematics, science, and other technologies that address needs and solve problems in the community. • explain the impact of the use and abuse of electronically generated information on individuals and families. 		
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Standard 3: Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.

NOTE: DSM is an inquiry approach to teaching science. In doing the activities in the science program, students have many opportunities to use mathematics concepts and skills. In addition to the opportunities to do mathematics in the investigations of DSM, each of the DSM modules provides numerous Math Connections. In doing Math Connections students solve math problems related to the science content being studied. Listed below are some of the investigations and activities that reinforce the teaching of this standard.

Mathematical Reasoning

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>1. Students use mathematical reasoning to analyze mathematical situations, make conjectures, gather evidence, and construct an argument. Students:</p> <ul style="list-style-type: none"> • apply a variety of reasoning strategies. • make and evaluate conjectures and arguments using appropriate language. • make conclusions based on inductive reasoning. • justify conclusions involving simple and compound (i.e., and/or) statements. 	<p>Simple Machines Activity 3, 8 Flight and Rocketry Activity 8-9 Erosion Activity 10, Science and Math Newton's Toy Box Activity 7-9 Matter and Change Activity 1-2 Famous Scientists Activity 2, 7</p>	<p>Pages 25-31, 65-69 Pages 81-97 Pages 89 Pages 39-54 Pages 7-21 Pages 21-28, 65-75</p>

Number and Numeration

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>2. Students use number sense and numeration to develop an understanding of the multiple uses of numbers in the real world, the use of numbers to communicate mathematically, and the use of numbers in the development of mathematical ideas.</p> <p>Students:</p> <ul style="list-style-type: none"> understand, represent, and use numbers in a variety of equivalent forms (integer, fraction, decimal, percent, exponential, expanded and scientific notation). understand and apply ratios, proportions, and percents through a wide variety of hands-on explorations. develop an understanding of number theory (primes, factors, and multiples). recognize order relations for decimal, integers and rational numbers. 	<p>Color and Light Activity 9, Science and Math</p> <p>Electromagnetism Activity 6</p> <p>Simple Machines Activity 2, 7-8</p> <p>Flight and Rocketry Activity 8-9</p> <p>Earth, Moon and Sun Activity 5</p> <p>Newton's Toy Box Activity 7-9</p> <p>Electrical Connections Activity 11, Science and Math</p> <p>If Shipwrecks Could Talk Activity 4</p>	<p>Pages 83</p> <p>Pages 43-48</p> <p>Pages 19-24, 57-69</p> <p>Pages 81-97</p> <p>Pages 37-43</p> <p>Pages 39-54</p> <p>Page 76</p> <p>Pages 35-45</p>

Operations

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>3. Students use mathematical operations and relationships among them to understand mathematics.</p> <p>Students:</p> <ul style="list-style-type: none"> add, subtract, multiply, and divide fractions, decimals, and integers. explore and use the operations dealing with roots and powers. use grouping symbols (parentheses) to clarify the intended order of operations. apply the associative, commutative, distributive, inverse, and identify properties. demonstrate an 	<p>Simple Machines Activity 1</p> <p>Pollution Activity 2</p> <p>Activity 6, Science and Math</p> <p>Oceans Activity 4, Science and Math</p> <p>Fungi-Small Wonders Activity 3, Science and Math</p> <p>Matter and Change Activity 1</p> <p>Newton's Toy Box Activity 7-9</p> <p>Electrical Connections Activity 5, Science and Math</p> <p>Famous Scientists Activity 2</p>	<p>Pages 13-18</p> <p>Pages 19-24 Page 52</p> <p>Page 54</p> <p>Page 23</p> <p>Pages 7-13</p> <p>Pages 39-54</p> <p>Page 36</p> <p>Pages 21-28</p>

<p>understanding of operational algorithms (procedures for adding, subtracting, etc.).</p> <ul style="list-style-type: none"> • develop appropriate proficiency with facts and algorithms. • apply concepts of ratio and proportion to solve problems. 		
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Modeling/Multiple Representation

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>4. Students use mathematical modeling/multiple representation to provide a means of presenting, interpreting, communicating, and connecting mathematical information and relationships. Students:</p> <ul style="list-style-type: none"> • visualize, represent, transform two- and three-dimensional shapes. • use maps and scale drawings to represent real objects or places. • use the coordinate plane to explore geometric ideas. • represent numerical relationships in one- and two- dimensional graphs. • use variables to represent relationships. • use concrete materials and diagrams to describe the operation of real-world processes and systems. • develop and explore models that do and do not rely on chance. • investigate both two- and three-dimensional transformations. • use appropriate tools to construct and verify geometric relationships. • develop procedures for basic geometric constructions. 	<p>You and Your Body Activity 3 Erosion Activity 7 Electromagnetism Activity 6 Solar Energy Activity 2-8 Famous Scientists Activity 2-3 Matter and Change Activity 2 Electrical Connections Activity 8 Earth, Moon and Sun Activity 3-4</p>	<p>Pages 27-31 Pages 59-66 Pages 43-48 Pages 13-58 Pages 21-34 Pages 15-21 Pages 53-58 Pages 23-35</p>

Measurement

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>5. Students use measurement in both metric and English measure to provide a major link between the abstractions of mathematics and the real world in order to describe and compare objects and data.</p> <p>Students:</p> <ul style="list-style-type: none"> estimate, make, and use measurements in real-world situations. select appropriate standard and nonstandard measurement units and tools to measure to a desired degree of accuracy. develop measurement skills and informally derive and apply formulas in direct measurement activities. use statistical methods and measures of central tendencies to display, describe, and compare data. Explore and produce graphic representations of data using calculator/computers. develop critical judgment for the reasonableness of measurement. 	<p>Simple Machines Activity 1-3</p> <p>Solar Energy Activity 2-9</p> <p>Flight and Rocketry Activity 8-9</p> <p>Weather Forecasting Activity 3, 5</p> <p>Famous Scientists Activity 1-2, 7</p> <p>Newton's Toy Box Activity 7-9</p> <p>Matter and Change Activity 1-2</p> <p>If Shipwrecks Could Talk Activity 2</p>	<p>Pages 13-24</p> <p>Pages 13-64</p> <p>Pages 81-97</p> <p>Pages 25-32, 41-48</p> <p>Pages 11-28, 65-75</p> <p>Pages 39-54</p> <p>Pages 7-21</p> <p>Pages 19-26</p>

Uncertainty

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>6. Students use ideas of uncertainty to illustrate that mathematics involves more than exactness when dealing with everyday situations.</p> <p>Students:</p> <ul style="list-style-type: none"> use estimation to check the reasonableness of results obtained by computation, algorithms, or the use of technology. use estimation to solve problems for which exact answers are inappropriate. 	<p>Fungi-Small Wonders Activity 7</p> <p>Oceans Activity 3</p> <p>Pollution Activity 11-12</p> <p>If Shipwrecks Could Talk Activity 4</p> <p>Electrical Connections Activity 5</p> <p>Earth, Moon and Sun Activity 5</p> <p>Astronomy Activity 11</p>	<p>Pages 45-49</p> <p>Pages 31-41</p> <p>Pages 77-88</p> <p>Pages 35-45</p> <p>Pages 31-36</p> <p>Pages 37-43</p> <p>Pages 93-99</p>

<ul style="list-style-type: none"> • estimate the probability of events. • use stimulation techniques to estimate probabilities. • determine probabilities of independent and mutually exclusive events. 		
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Patterns/Functions

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>7. Students use patterns and functions to develop mathematical power, appreciate the true beauty of mathematics, and construct generalizations that describe patterns simply and efficiently. Students:</p> <ul style="list-style-type: none"> • recognize, describe, and generalize a wide variety of patterns and functions. • describe and represent patterns and functional relationships using tables, charts and graphs, algebraic expressions, rules, and verbal descriptions. • develop methods to solve basic linear and quadratic equations. • develop an understanding of functions and functional relationships; that a change in one quantity (variable) results in change in another . • verify results of substituting variables. • apply the concept of similarity in relevant situations. • use properties of polygons to classify them. • explore relationships involving points, lines, angles, and planes. • develop and apply the Pythagorean principle in the solution of problems. • explore and develop basic concepts of right triangle trigonometry. • use patterns and functions to represent and solve 	<p>Electromagnetism Activity 6 Fungi-Small Wonders Activity 7 Flight and Rocketry Activity 8-9 You and Your Body Activity 3 Famous Scientists Activity 2 Matter and Change Activity 2 Newton’s Toy Box Activity 8 Electrical Connections Activity 8-9</p>	<p>Pages 43-48 Pages 45-49 Pages 81-97 Pages 27-31 Pages 21-28 Pages 15-21 Pages 45-49 Pages 53-64</p>

problems.		
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Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.

Physical Setting

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>1. The Earth and celestial phenomena can be described by principles of relative motion and perspective.</p> <p>Students:</p> <ul style="list-style-type: none"> explain daily, monthly, and seasonal changes on earth. 	<p>Oceans Activity 9 Reader</p> <p>Astronomy Activity 1-5</p> <p>Earth, Moon and Sun Activity 1-2, 7-12</p>	<p>Pages 99-111 Page 9</p> <p>Pages 7-51</p> <p>Pages 7-21, 53-103</p>
<p>2. Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land</p> <p>Students:</p> <ul style="list-style-type: none"> explain how the atmosphere (air), hydrosphere (water), and lithosphere (land) interact, evolve, and change. describe volcano and earthquake patterns, the rock cycle, and weather climate changes. 	<p>Rocks and Minerals Activity 10 Reader</p> <p>Pollution Activity 9-10 Reader</p> <p>Erosion Activity 1-12 Reader</p> <p>Weather Forecasting Activity 3-5, 9-12 Reader</p> <p>Oceans Activity 5-9 Reader</p> <p>Earth Processes Activity 3-6, 12-14 Reader</p> <p>Famous Scientists Activity 9</p>	<p>Pages 77-84 Pages 9-13</p> <p>Pages 65-76 Pages 5-12</p> <p>Pages 13-104 Pages 4-15</p> <p>Pages 25-48, 69-93 Pages 2-4, 7-9</p> <p>Pages 55-99 Pages 6-8, 10</p> <p>Pages 21-53, 89-112 Pages 10-20</p> <p>Pages 85-93</p>
<p>3. Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.</p> <p>Students:</p> <ul style="list-style-type: none"> observe and describe properties of materials such as density, conductivity, and solubility. distinguish between chemical and physical changes. develop their own mental models to explain 	<p>Electromagnetism Activity 1 Reader</p> <p>Oceans Activity 2-3 Reader</p> <p>Rocks and Minerals Activity 1-7 Reader</p> <p>Erosion Activity 1 Reader</p> <p>Flight and Rocketry Activity 3</p> <p>Matter and Change</p>	<p>Pages 13-17 Page 3</p> <p>Pages 23-41 Page 3</p> <p>Pages 13-55 Pages 2-6</p> <p>Pages 13-19 Pages 5-6</p> <p>Pages 13-21</p>

common chemical reactions and changes in stated of matter.	Activity 1-3, 7-13 Electrical Connections Activity 1	Pages 7-28, 53-97 Pages 7-12
4. Energy exists in many forms, and when these forms change energy is conserved. Students: <ul style="list-style-type: none"> describe the sources and identify the transformations of energy observed in everyday life. observe and describe heating and cooling events. observe and describe energy changes as related to chemical reactions. observe and describe the properties of sound, light, magnetism, and electricity. describe situations that support the principle of conservation of energy. 	Solar Energy Activity 1-13 Color and Light Activity 1 Reader Electromagnetism Activity 1-11 Reader Lenses and Mirrors Activity 1-9 Flight and Rocketry Activity 3 Reader Simple Machines Reader Electrical Connections Activity 1-13 Famous Scientists Activity 5-7	Pages 7-88 Pages 13-18 Pages 2-9 Pages 13-83 Pages 2-13 Pages 7-24 Pages 33-43 Pages 10-13 Page 3 Pages 7-88 Pages 45-75
5. Energy and matter interact through forces that result in changes in motion. Students: <ul style="list-style-type: none"> describe different patterns of motion of objects. observe, describe, and compare effects of forces (gravity, electric current and magnetism) on the motion of objects. 	Simple Machines Activity 1-12 Flight and Rocketry Activity 2-12 Electromagnetism Activity 5, 7, 9-10 Newton's Toy Box Activity 1-13 Famous Scientists Activity 1-3 Electrical Connections Activity 11	Pages 13-96 Pages 23-130 Pages 37-42, 49-56, 63-76 Pages 7-70 Pages 11-34 Pages 71-76

The Living Environment

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
1. Living things are both similar to and different from each other and nonliving things. Students: <ul style="list-style-type: none"> compare and contrast the parts of plants, animals, and one-celled organisms. explain the functioning of the major human organ systems and their interactions. 	You and Your Body Activity 1-8, 13-14 Reader Oceans Activity 10-12 Reader Pond Life Activity 5-9 Fungi-Small Wonders Activity 1-2, 4, 6 Plants in Our World Activity 1-2	Pages 13-66, 91-102 Pages 2-11 Pages 113-142 Pages 12-13 Pages 35-67 Pages 7-18, 25-29, 37-44 Pages 7-18
2. Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring.	Pond Life Activity 10 Fungi-Small Wonders Activity 4 DNA-From Genes to	Pages 69-74 Pages 25-29

<p>Students:</p> <ul style="list-style-type: none"> describe sexual and asexual mechanisms for passing genetic materials from generation to generation. describe simple mechanisms related to the inheritance of some physical traits in offspring. 	<p>Proteins Activity 1-5 Activity 5, Science Extension</p>	<p>Pages 7-35 Page 35</p>
<p>3. Individual organisms and species change over time. Students:</p> <ul style="list-style-type: none"> describe sources of variation in organisms and their structures and relate the variations to survival. describe factors responsible for competition within species and the significance of that competition. 	<p>Oceans Activity 11 Reader Plants in Our World Activity 1, Science Challenge</p>	<p>Pages 125-134 Pages 12-13 Page 12</p>
<p>4. The continuity of life is sustained through reproduction and development. Students:</p> <ul style="list-style-type: none"> observe and describe the variations in reproductive patterns of organisms, including asexual and sexual reproduction. explain the role of sperm and egg cells in sexual reproduction. observe and describe developmental patterns in selected plants and animals (e.g., insects, frogs, humans, seed-bearing plants). observe and describe cell division at the microscopic level and its macroscopic effects. 	<p>Pond Life Activity 10 Fungi-Small Wonders Activity 4 You and Your Body Reader DNA-From Genes to Proteins Activity 5, Science Extension</p>	<p>Pages 69-74 Pages 25-29 Page 2 Page 35</p>
<p>5. Organisms maintain a dynamic equilibrium that sustains life. Students:</p> <ul style="list-style-type: none"> compare the way a variety of living specimens carry out basic life functions and maintain dynamic equilibrium. describe the importance of major nutrients, vitamins, and minerals in maintaining health and 	<p>You and Your Body Activity 9-12 Reader Oceans Activity 10 Pond Life Activity 8-10 Plants in Our World Activity 4-6, 8-10</p>	<p>Pages 67-89 Page 9 Pages 113-124 Pages 57-74 Pages 25-41, 51-68</p>

<p>promoting growth and explain the need for a constant input of energy for living organisms.</p>		
<p>6. Plants and animals depend on each other and their physical environment. Students:</p> <ul style="list-style-type: none"> describe the flow of energy and matter through food chains and food webs. provide evidence that green plants make food and explain the significance of this process to other organisms. 	<p>Pond Life Activity 11 Activity 11, Science Challenge Activity 11, Science Extension Plants in Our World Activity 8-10</p>	<p>Pages 75-80 Page 80 Page 80 Pages 51-68</p>
<p>7. Human decisions and activities have had a profound impact on the physical and living environment. Students:</p> <ul style="list-style-type: none"> describe how living things, including humans, depend upon the living and nonliving environment for their survival. describe the effects of environmental changes on humans and other populations. 	<p>Pollution Activity 6, 10 Reader Pond Life Activity 4, 10 Activity 11, Science, Technology and Society Plants in Our World Activity 3-6 Famous Scientists Activity 9 Activity 10, Science and Health</p>	<p>Pages 47-52, 71-76 Pages 2-12 Pages 27-34, 75-80 Page 80 Pages 19-41 Pages 85-93 Page 103</p>

Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.

Engineering Design

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>1. Engineering design is an iterative process involving modeling and optimization used to develop technological solutions to problems within given constraints. Students engage in the following steps in a design process:</p> <ul style="list-style-type: none"> identify needs and opportunities for technical solutions form an investigation of situations of general or social interests. 	<p>DSM modules provide the opportunity for students to develop technological solutions to problems. See for example: Oceans Activity 10, Science Challenge Lenses and Mirrors Activity 12 Simple Machines Activity 12, Science Challenge Solar Energy Activity 11-12 Activity 11, Science Challenge Flight and Rocketry</p>	<p>Page 124 Pages 89-94 Page 94 Page 71-82 Page 76</p>

<ul style="list-style-type: none"> locate and utilize a range of printed, electronic, and human information resources to obtain ideas. consider constraints and generate several ideas for alternative solutions, using group and individual ideation techniques (group discussions, brainstorming, forced connections, role play); defer judgment until a number of ideas have been generated; evaluate (critique ideas; and explain why the chosen solution is optimal. Develop plans, including drawings with measurements and details of construction, and construct a model of the solution, exhibiting a degree of craftsmanship.. in a group setting test their solution against design specifications, present and evaluate results, describe how the solution might have been modified for different and better results, and discuss tradeoffs that might have to be made. 	<p>Activity 5, Reinforcement If Shipwrecks Could Talk Activity 4, Activity 4, Science Extension Electrical Connections Activity 12, Science Challenge Newton’s Toy Box Activity 10, Science Challenge</p>	<p>Page 63 Pages 35-45 Page 45 Page 81 Page 58</p>
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Tools, Resources, and Technological Processes

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>2. Technological tools, materials, and other resources should be selected on the basis of safety, cost, availability, appropriateness, and environmental impact; technological processes change energy, information, and material resources into more useful forms. Students:</p> <ul style="list-style-type: none"> choose and use resources for a particular purpose based upon an analysis and understanding of their properties, costs, availability, and 	<p>Lenses and Mirrors Activity 12 Simple Machines Activity 12, Science Challenge Oceans Activity 10, Science Challenge Solar Energy Activity 11, Science Challenge If Shipwrecks Could Talk Activity 4, Science Extension Newton’s Toy Box Activity 10, Science Challenge</p>	<p>Pages 89-94 Page 94 Page 124 Page 76 Page 45 Page 58</p>

<p>environmental impact.</p> <ul style="list-style-type: none"> • use a variety of hand tools and machines to change materials into new forms through forming, separating, and combining processes, and processes which cause internal change to occur. • combine manufacturing processes with other technological processes to produce, market, and distribute a product. • process energy into other forms and information into more meaningful information. 		
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Computer Technology

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>3. Computers, as tools for design, modeling, information processing, communication, and system control, have greatly increased human productivity and knowledge. Students:</p> <ul style="list-style-type: none"> • assemble a computer system including keyboard, central processing unit and disc drives, mouse, printer, and monitor. • use a computer system to connect to and access needed information form various Internet sites. • use computer hardware and software to draw and dimension prototypical designs. • use a computer as a modeling tool. • use a computer system to monitor and control external events and/or systems. 	<p>Use of information systems/computers is encouraged.</p>	

Technological Systems

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>4. Technological systems are</p>	<p>Simple Machines</p>	

<p>designed to achieve specific results and produce outputs, such as products, structures, services, energy, or other systems.</p> <p>Students:</p> <ul style="list-style-type: none"> select appropriate technological systems on the basis of safety, function, cost, ease of operation, and quality of post-purchase support. assemble, operate, and explain the operation of simple open- and closed-loop electrical, electronic, mechanical, and pneumatic systems. describe how subsystems and system elements (inputs, processes, outputs) interact within systems. describe how system control requires sensing information, processing it, and making changes. 	<p>Activity 7 Reader Solar Energy Activity 9-10 Flight and Rocketry Activity 8-9, 11-12 Reader Electromagnetism Activity 6-10 Reader Electrical Connections Activity 11-12 Famous Scientists Activity 4-6</p>	<p>Pages 57-63 Page 10-11</p> <p>Pages 59-70</p> <p>Pages 81-97, 111-130 Pages 8-13</p> <p>Pages 43-76 Pages 10-13</p> <p>Pages 71-81</p> <p>Pages 35-43</p>
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History and Evolution of Technology

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>5. Technology has been the driving force in the evolution of society from an agricultural to an industrial to an information base.</p> <p>Students:</p> <ul style="list-style-type: none"> describe how the evolution of technology led to the shift in society from an agricultural base to an industrial base to an information base. understand the contributions of people of different genders, races, and ethnic groups to technological development. Describe how new technologies have evolved as a result of combining existing technologies (e.g., photography combined optics and chemistry; the airplane combined kite and glider technology with 	<p>DSM modules provide the opportunity for the teaching of this concept. See for example:</p> <p>Simple Machines Reader</p> <p>Weather Forecasting Reader</p> <p>Oceans Reader</p> <p>Color and Light Activity 2, Science, Technology and Society</p> <p>Electromagnetism Reader</p> <p>Flight and Rocketry Reader</p> <p>Earth, Moon and Sun Activity 3, Science and Social Studies</p> <p>Activity 6, Science, Technology and Society</p> <p>Electrical Connections Activity 1, Science and Social Studies</p> <p>Newton's Toy Box Activity 1, Science and Social</p>	<p>Pages 11-13</p> <p>Page 14</p> <p>Pages 14-15</p> <p>Page 27</p> <p>Pages 8-15</p> <p>Pages 4-15</p> <p>Page 28</p> <p>Page 52</p> <p>Page 12</p>

a lightweight gasoline engine).	Studies Famous Scientists Activity 1-12	Page 11 Pages 11-121
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Impact of Technology

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>6. Technology can have positive and negative impacts on individuals, society, and the environment and humans have the capability and responsibility to constrain or promote technological development.</p> <p>Students:</p> <ul style="list-style-type: none"> describe how outputs of a technological system can be desired, undesired, expected, or unexpected. describe through examples how modern technology reduces manufacturing and construction costs and produces more uniform products. 	<p>DSM modules provide the opportunity for the teaching of this concept. See for example:</p> <p>Simple Machines Reader</p> <p>Weather Forecasting Reader</p> <p>Pollution Reader</p> <p>Electromagnetism Reader</p> <p>Flight and Rocketry Reader</p> <p>You and Your Body Activity 8, Science, Technology and Society</p> <p>Oceans Activity 9, Science, Technology and Society</p> <p>Electrical Connections Activity 9, Science, Technology and Society</p> <p>Astronomy Activity 1, Science, Technology and Society</p> <p>Plants in Our World Activity 10, Science, Technology and Society</p> <p>DNA-From Genes to Proteins Activity 12-13</p>	<p>Pages 12, 15</p> <p>Page 14</p> <p>Pages 3-13, 15</p> <p>Pages 9-13, 15</p> <p>Pages 8-13</p> <p>Page 66</p> <p>Pages 111</p> <p>Page 64</p> <p>Pages 16</p> <p>Page 68</p> <p>Pages 81-94</p>

Management of Technology

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>7. Project management is essential to ensuring that technological endeavors are profitable and that products and systems are of high quality and built safely, on schedule, and within budget.</p> <p>Students:</p> <ul style="list-style-type: none"> manage time and financial resources in a technological project. 		

<ul style="list-style-type: none"> provide examples of products that are well (and poorly) designed and made, describe their positive and negative attributes, and suggest measures that can be implemented to monitor quality during production. assume leadership responsibilities within a structured group activity. 		
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Standard 6: Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning.

System Thinking

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>1. Through systems thinking, people can recognize the commonalities that exist among all systems and how parts of a system interrelate and combine to perform specific functions.</p> <p>Students:</p> <ul style="list-style-type: none"> observe and describe interactions among components of simple systems. identify common things that can be considered to be systems (e.g., a plant population, a subway system, human beings). 	<p>Flight and Rocketry Activity 8-9, 11-12 Reader</p> <p>Electromagnetism Activity 6-10 Reader</p> <p>Simple Machines Activity 2, 5-8, 12 Reader</p> <p>Lenses and Mirrors Activity 3-4, 10</p> <p>You and Your Body Activity 1-6 Reader</p> <p>Earth, Moon and Sun Activity 8-11</p> <p>Astronomy Activity 1-6</p> <p>Electrical Connections Activity 2-4, 8-13</p> <p>Newton's Toy Box Activity 7-10</p> <p>Famous Scientists Activity 4-6</p>	<p>Pages 81-97, 111-130 Pages 4-13</p> <p>Pages 43-76 Pages 4-5, 8-13</p> <p>Pages 19-24, 39-69, 91-95 Pages 4-12</p> <p>Pages 21-34, 75-82</p> <p>Pages 13-54 Pages 2-11</p> <p>Pages 61-93</p> <p>Pages 7-60</p> <p>Pages 13-30, 53-88</p> <p>Pages 39-58</p> <p>Pages 35-64</p>

Models

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>2. Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.</p>	<p>You and Your Body Activity 1, 4, 6</p> <p>Electromagnetism Activity 6-7, 10</p> <p>Oceans</p>	<p>Pages 13-18, 33-39, 49-54</p> <p>Pages 43-56, 69-76</p>

<p>Students:</p> <ul style="list-style-type: none"> select an appropriate model to begin the search for answers or solutions to a question or problem. use models to study processes that cannot be studied directly (e.g., when the real process is too small, too fast or too dangerous for direct observation). demonstrate the effectiveness of different models to represent the same thing and the same model to represent different things. 	<p>Activity 6-10 Erosion Activity 10-12 Flight and Rocketry Activity 7-9, 11-12 Earth Processes Activity 4-7 Astronomy Activity 2, 4 Earth, Moon and Sun Activity 9-12 DNA-From Genes to Proteins Activity 4-6</p>	<p>Pages 65-124 Pages 83-104 Pages 73-97, 111-130 Pages 31-60 Pages 17-23, 35-42 Pages 69-103 Pages 25-44</p>
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Magnitude and Scale

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>3. The grouping of magnitudes of size, time, frequency, and pressures or other units of measurement into a series of relative order provides a useful way to deal with the immense range and the changes in scale that affect the behavior and design of systems. Students:</p> <ul style="list-style-type: none"> cite examples of how different aspects of natural and designed systems change at different rates with changes in scale. use powers of ten notation to represent very small and very large numbers. 	<p>Astronomy Activity 11 Earth, Moon and Sun Activity 3-5 Matter and Change Activity 2</p>	<p>Pages 93-99 Pages 23-43 Pages 15-21</p>

Equilibrium and Stability

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>4. Equilibrium is a state of stability due either to a lack of changes (static equilibrium) or a balance between opposing forces (dynamic equilibrium). Students:</p> <ul style="list-style-type: none"> describe how feedback mechanisms are used in both designed and natural systems to keep changes 	<p>Simple Machines Activity 2 Pollution Activity 10 You and Your Body Activity 4 Flight and Rocketry Activity 3, 10 Erosion Activity 7</p>	<p>Pages 19-24 Pages 71-76 Pages 41-48 Pages 33-43, 99-109 Pages 59-66</p>

<p>within desired limits.</p> <ul style="list-style-type: none"> describe changes within equilibrium cycles in terms of frequency or cycle length and determine the highest and lowest values and when they occur. 	<p>Fungi-Small Wonders Activity 7</p> <p>Plants in Our World Activity 11</p> <p>Newton's Toy Box Activity 10, 13</p> <p>Famous Scientists Activity 1-3</p>	<p>Pages 45-49</p> <p>Pages 31-41</p> <p>Pages 55-58, 67-70</p> <p>Pages 11-28</p>
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Pattern of Changes

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>5. Identifying patterns of change is necessary for making predictions about future behavior and conditions. Students:</p> <ul style="list-style-type: none"> use simple linear equations to represent how a parameter changes with time. observe on what might happen in the future. 	<p>Erosion Activity 4, 7</p> <p>Simple Machines Activity 2, 7</p> <p>Weather Forecasting Activity 5</p> <p>Electromagnetism Activity 6</p> <p>Solar Energy Activity 3-6</p> <p>You and Your Body Activity 5</p> <p>Plants in Our World Activity 3</p> <p>Famous Scientists Activity 1-2</p> <p>Matter and Change Activity 12</p>	<p>Pages 37-42, 59-66</p> <p>Pages 19-24, 57-63</p> <p>Pages 41-48</p> <p>Pages 43-48</p> <p>Pages 21-46</p> <p>Pages 41-48</p> <p>Pages 19-24</p> <p>Pages 11-28</p> <p>Pages 87-92</p>

Optimization

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>6. In order to arrive at the best solution that meets criteria within constraints, it is often necessary to make trade-offs. Students:</p> <ul style="list-style-type: none"> determine the criteria and constraints and make trade-offs to determine the best decision. use graphs of information for a decision making problem to determine the optimum solution. 	<p>Pollution Activity 10</p> <p>Electromagnetism Activity 6</p> <p>Pond Life Activity 10</p> <p>Solar Energy Activity 3-8</p> <p>Fungi-Small Wonders Activity 7</p> <p>Electrical Connections Activity 9</p> <p>Newton's Toy Box Activity 8</p> <p>Plants in Our World Activity 3,</p> <p>Famous Scientists Activity 7</p>	<p>Pages 71-76</p> <p>Pages 43-48</p> <p>Pages 69-74</p> <p>Pages 21-58</p> <p>Pages 45-49</p> <p>Pages 59-64</p> <p>Pages 45-49</p> <p>Pages 19-24</p> <p>Pages 65-75</p>

Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.

Connections

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>1. The knowledge and skills of mathematics, science, and technology are used together to make informed decisions and solve problems, especially those relating to issues of science/technology/society, consumer decision making, design, and inquiry into phenomena.</p> <p>Students:</p> <ul style="list-style-type: none"> • analyze science/technology/society problems and issues at the local level and plan and carryout a remedial course of action. • make informed consumer decisions by seeking answers to appropriate questions about products, services, and systems; determining the cost/benefit and risk/benefit tradeoffs; and applying this knowledge to a potential purchase. • design solutions to real-world problems of general social interest related to home, school, or community using scientific experimentation to inform the solution and applying mathematical concepts and reasoning to assist in developing a solution. • describe and explain phenomena by designing and conducting investigations involving systematic observations, accurate measurements, and the identifications and control of variables; by inquiring into relevant mathematical ideas; and by using mathematical 	<p>Solar Energy Activity 11-13</p> <p>Lenses and Mirrors Activity 11-12</p> <p>Rocks and Minerals Activity 11</p> <p>Erosion Activity 10-11</p> <p>You and Your Body Activity 12</p> <p>Pollution Activity 1-3, 5-6, 11-12</p> <p>Pond Life Activity 12</p> <p>Plants in Our World Activity 3</p> <p>Matter and Change Activity 12</p> <p>Famous Scientists Activity 7-8</p> <p>DNA-From Genes to Proteins Activity 12-13</p>	<p>Pages 71-88</p> <p>Pages 83-94</p> <p>Pages 85-92</p> <p>Pages 83-97</p> <p>Pages 85-89</p> <p>Pages 12-30, 39-52, 77-88</p> <p>Pages 81-86</p> <p>Pages 19-24</p> <p>Pages 87-92</p> <p>Pages 65-84</p> <p>Pages 81-94</p>

and technological tools and procedures to assist in the investigation.		
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Strategies

CONTENT STANDARDS/ PERFORMANCE INDICATORS	DSM ACTIVITY	PAGE NUMBER(S)
<p>2. Solving interdisciplinary problems involves a variety of skills and strategies, including effective work habits; gathering and processing information; generating and analyzing ideas; realizing ideas; making connections among the common themes of mathematics, science, and technology; and presenting results.</p> <p>Students participate in an extended, culminating mathematics, science, and technology project. The project would require students to:</p> <ul style="list-style-type: none"> • work effectively • gather and process information • generate and analyze ideas • observe common themes • realize ideas • present results 	<p>DSM modules provide the opportunity to develop these skills and strategies. See for example:</p> <p>Pond Life Activity 12</p> <p>Pollution Activity 1-2, 11-12</p> <p>Lenses and Mirrors Activity 12</p> <p>Astronomy Activity 12</p> <p>Plants in Our World Activity 12</p> <p>If Shipwrecks Could Talk Activity 11</p>	<p>Pages 81-86</p> <p>Pages 13-24, 77-88</p> <p>Pages 89-94</p> <p>Pages 101-110</p> <p>Pages 77-81</p> <p>Pages 103-108</p>