



# DELTA SCIENCE MODULES (DSM)

Correlation with

## MINNESOTA

## SCIENCE STANDARDS AND BENCHMARKS

## FOR GRADES K-8



**State of Minnesota**  
***State Science Standards  
and Benchmarks***  
***Grades K-8***

**Correlated with DSM  
(Delta Science Modules)**

The following is a correlation of the Science Standards and Benchmarks for the State of Minnesota to Delta Science Modules. This correlation shows representative examples of investigations and activities from the programs that address the Science Benchmarks. A citation does not include all of the investigations or activities that might address a particular benchmark.

June 2010

# Kindergarten

## The Nature of Science and Engineering

BENCHMARK	DSM	PAGES
0.1.1.2.1 Use observations to develop an accurate description of a natural phenomenon and compare one's observations and descriptions with those of others.	All DSM modules provide the opportunity to address this benchmark. Students observe objects and discuss their observations. See examples below: <b>Properties</b> Activity 6-11 <b>Investigating Water</b> Activity 1-5 <b>Sunshine and Shadows</b> Activity 4-7 <b>Finding the Moon</b> Activity 3-4	Pages 47-86 Pages 13-46 Pages 33-63 Pages 29-46
0.1.2.1.1 Sort objects into two groups: those that are found in nature and those that are human made.  <i>For example:</i> Cars, pencils, trees, rocks	DSM provides the opportunity to address this benchmark. See below: <b>How Do We Learn</b> Activity 4-5, 12 <b>Finding the Moon</b> Activity 1-2 <b>From Seed to Plant</b> Activity 1-3 <b>Observing an Aquarium</b> Activity 1-6 <b>Investigating Water</b> Activity 1-3 <b>Properties</b> Activity 12	Pages 37-49, 95-101 Pages 13-28 Pages 15-33 Pages 15-67, 109-125 Pages 13-34 Pages 87-93

## Physical Science

BENCHMARK	DSM	PAGES
0.2.1.1.1 Sort objects in terms of color, size and shape, and texture and communicate reasoning for the sorting system.	<b>Properties</b> Activity 1-5 <b>How Do We Learn</b> Activity 2-3	Pages 13-46 Pages 23-35

## Earth Science

BENCHMARK	DSM	PAGES
0.3.2.2.1 Monitor daily and seasonal changes in weather and summarize the changes.  <i>For example:</i> Recording cloudiness, rain, snow and temperature.	This benchmark is addressed in the grade 2 module <u>Weather Watching</u> .	
0.3.2.2.2 Identify the sun as a source of heat and light.  <i>For example:</i> Record the time of day when the sun shines into different locations of the school and note patterns.	<b>Sunshine and Shadows</b> Activity 4-7 Reader <b>Finding the Moon</b> Reader	Pages 33-63 Page 2 Page 4

## Life Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
0.4.1.1.1 Observe and compare plants and animals.	<b>From Seed to Plant</b> Activity 1-14 Reader <b>Observing an Aquarium</b> Activity 3-6 Reader	Pages 15-109 Pages 2-11  Pages 31-67 Pages 4-11
0.4.1.1.2 Identify the external parts of a variety of plants and animals including humans.  <i>For example:</i> Heads, legs, eyes and ears on humans and animals; flowers, stems and roots on many plants.	<b>From Seed to Plant</b> Activity 3-5, 9-10 Reader <b>Observing an Aquarium</b> Activity 3-7 Reader <b>How Do We Learn</b> Activity 1	Pages 33-52, 73-84 Pages 5-9  Pages 31-78 Pages 6-9  Pages 13-22
0.4.1.1.3 Differentiate between living and nonliving things.  <i>For example:</i> Sort organisms and objects (or pictures of these) into groups of those that grow and reproduce and need air, food and water, and those that don't.	DSM provides the opportunity to address this benchmark. See below: <b>Properties</b> Activity 1-6 <b>Investigating Water</b> Activity 1-2 <b>How Do We Learn</b> Activity 2-3 <b>From Seed to Plant</b> Activity 1-14 <b>Observing an Aquarium</b> Activity 1-12	Pages 13-57  Pages 13-26  Pages 23-41  Pages 15-105  Pages 15-125
0.4.2.1.1 Observe a natural system or its model and identify living and nonliving components in that system.  <i>For example:</i> A wetland, prairie, garden or aquarium.	<b>Observing an Aquarium</b> Activity 2-6, 12	Pages 23-67, 117-125

# Grade One

## The Nature of Science and Engineering

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
<p>1.1.1.1.1 When asked "How do You Know?" students should support their answer with observations.</p> <p><i>For example:</i> Use observations to tell why a squirrel is a living thing.</p>	<p>DSM activities and discussions stress that students use evidence to support their findings. See for example:</p> <p><b>Properties</b> Activity 6-7, 10-11</p> <p><b>Investigating Water</b> Activity 4-5, 7-8</p> <p><b>From Seed to Plant</b> Activity 6-8</p> <p><b>Observing an Aquarium</b> Activity 11</p> <p><b>Sunshine and Shadows</b> Activity 4-7</p>	<p>Pages 47-60, 75-86</p> <p>Pages 35-46, 55-69</p> <p>Pages 53-72</p> <p>Pages 109-116</p> <p>Pages 33-63</p>
<p>1.1.1.1.2 Recognize that describing things as accurately as possible is important in science because it enables people to compare their observations with those of others.</p>	<p>DSM activities rely on accurate observations by students and students compare observations in post-activity discussions. See examples below:</p> <p><b>Properties</b> Activity 6-11</p> <p><b>Investigating Water</b> Activity 1-5</p> <p><b>Sunshine and Shadows</b> Activity 4-7</p> <p><b>Finding the Moon</b> Activity 3-4</p>	<p>Pages 47-86</p> <p>Pages 13-46</p> <p>Pages 33-63</p> <p>Pages 29-46</p>
<p>1.1.3.1.1 Observe that many living and nonliving things are made of parts and that if a part is missing or broken they may not function properly.</p>	<p><b>Properties</b> Activity 6</p> <p><b>How Do We Learn</b> Activity 12</p> <p><b>Observing an Aquarium</b> Activity 3-5</p> <p>Reader</p> <p><b>From Seed to Plant</b> Activity 9-10</p> <p>Reader</p>	<p>Pages 47-52</p> <p>Pages 95-101</p> <p>Pages 31-55</p> <p>Pages 6-9</p> <p>Pages 73-79</p> <p>Pages 6-9</p>
<p>1.1.3.2.1 Recognize that tools are used by people, including scientists and engineers, to gather information and solve problems.</p> <p><i>For example:</i> Magnifier, snowplow and calculator.</p>	<p><b>Properties</b> Activity 6-7</p> <p><b>Investigating Water</b> Activity 12</p> <p><b>Observing an Aquarium</b> Activity 3-6</p> <p><b>From Seed to Plant</b> Activity 1-4</p> <p><b>How Do We Learn</b> Activity 4-12</p> <p>Reader</p>	<p>Pages 47-60</p> <p>Pages 95-100</p> <p>Pages 31-67</p> <p>Pages 15-44</p> <p>Pages 37-101</p> <p>Pages 12-13</p>

## Physical Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
None listed.		

## Earth Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
1.3.1.3.1 Group or classify rocks		

in terms of color, shape and size.		
1.3.1.3.2 Describe similarities and differences between soil and rocks.  <i>For example:</i> Use screens to separate components of soil and observe the samples using a magnifier.	This benchmark is addressed in the grade 2 module <u>Soil Science</u> .	
1.3.1.3.3 Identify and describe large and small objects made of Earth materials.		

## Life Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
1.4.1.1.1 Describe and sort animals into groups in many ways, according to their physical characteristics and behaviors.	<b>Observing an Aquarium</b> Activity 4-6, 10 Reader	Pages 39-46, 97-107 Page 12
1.4.2.1.1 Recognize that animals need space, water, food, shelter and air.	<b>Observing an Aquarium</b> Activity 2 Reader	Pages 23-30 Pages 8-9, 12
1.4.2.1.2 Describe ways in which an animal's habitat provides for its basic needs.  <i>For example:</i> Compare students' houses with animal habitats.	<b>Observing an Aquarium</b> Activity 2, 12 Reader	Pages 23-30, 117-125 Pages 8-9, 12
1.4.3.1.1 Demonstrate an understanding that animals pass through life cycles that include a beginning, development into adults, reproduction and eventually death.  <i>For example:</i> Use live organisms or pictures to observe the changes that occur during the life cycle of butterflies, meal worms or frogs.	<b>Observing an Aquarium</b> Activity 10 Reader	Pages 97-107 Pages 10-11
1.4.3.1.2 Recognize that animals pass through the same life cycle stages as their parents.	<b>Observing an Aquarium</b> Activity 10 Reader	Pages 97-107 Pages 10-11

# Grade Two

## The Nature of Science and Engineering

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
2.1.1.2.1 Raise questions about the natural world and seek answers by making careful observations, noting what happens when you interact with an object, and sharing the answers with others.	All DSM modules provide the opportunity to address this benchmark See examples below: <b>Classroom Plants</b> Activity 3-7 <b>Plant and Animal Populations</b> Activity 9-11 <b>Soil Science</b> Activity 8-12 <b>States of Matter</b> Activity 8-11 <b>Force and Motion</b> Activity 3-7	Pages 29-71  Pages 85-110 Pages 69-114 Pages 65-89  Pages 31-72
2.1.2.2.1 Identify a need or problem and construct an object that helps to meet the need or solve the problem.  <i>For example:</i> Design and build a tool to show wind direction.  <i>Another example:</i> Design a kite and identify the materials to use.	<b>Weather Watching</b> Activity 4, 7 <b>Sink or Float</b> Activity 11-12 <b>Force and Motion</b> Activity 8-9	Pages 37-44, 61-68  Pages 89-107  Pages 73-90
2.1.2.2.2 Describe why some materials are better than others for making a particular object and how materials that are better in some ways may be worse in other ways.  <i>For example:</i> Objects made of plastic or glass.	DSM provides the opportunity to address this benchmark through student constructions. See for example: <b>Sink or Float</b> Activity 2, 11-12 Reader	Pages 21-27, 89-107 Pages 10, 12-13
2.1.2.2.3 Explain how engineered or designed items from everyday life benefit people.	<b>Weather Watching</b> Activity 2 <b>Sink or Float</b> Reader <b>Force and Motion</b> Activity 12 Reader <b>States of Matter</b> Reader <b>Classroom Plants</b> Activity 12	Pages 21-28  Pages 12-13  Pages 111-117 Pages 7, 12-14  Pages 13,15  Pages 105-112

## Physical Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
2.2.1.1.1 Describe objects in terms of color, size, shape, weight, texture, flexibility, strength and the types of materials in the object.	<b>Sink or Float</b> Activity 2, 5, 9-12  Reader <b>Soil Science</b> Activity 1-4, 7 Reader <b>Classroom Plants</b>	Pages 21-27, 43-51, 75-107 Pages 7-8, 10  Pages 15-44, 59-67 Pages 7-8

	Activity 2	Pages 23-28
2.2.1.2.1 Observe, record, and recognize that water can be a solid or a liquid and can change from one state to another.	<b>States of Matter</b> Activity 4-5, 7-12 Reader	Pages 35-50, 57-101 Pages 1-2, 8-9
2.2.2.1.1 Describe an object's position relative to other objects or a background.  <i>For example:</i> Forward, backward, going up, going down.	DSM provides the opportunity to address this benchmark. See below: <b>Force and Motion</b> Activity 2-9 <b>Sink or Float</b> Activity 1-4 <b>States of Matter</b> Activity 6-7 <b>Soil Science</b> Activity 2-3	Pages 23-90 Pages 19-42 Pages 51-63 Pages 21-36
2.2.2.1.2 Demonstrate that objects move in a variety of ways, including a straight line, a curve, a circle, back and forth, and at different speeds.  <i>For example:</i> Spinning toy and rocking toy.  <i>Another example:</i> Construct objects that will move in a straight line or a curve such as a marble or toy car on a track.	<b>Force and Motion</b> Activity 1-9 <b>Weather Watching</b> Activity 4	Pages 13-90 Pages 37-44
2.2.2.2.1 Describe how push and pull forces can make objects move.  <i>For example:</i> Push and pull objects on smooth and rough surfaces.	<b>Force and Motion</b> Activity 1-9 Reader	Pages 13-90 Pages 2-9
2.2.2.2.2 Describe how things near Earth fall to the ground unless something holds them up.	<b>Force and Motion</b> Activity 2 Reader <b>Sink or Float</b> Activity 1 Reader	Pages 23-29 Page 2 Pages 13-19 Pages 9-11

## Earth Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
2.3.2.2.1 Measure, record and describe weather conditions using common tools.  <i>For example:</i> Temperature, precipitation, sunrise/sunset, and wind speed/direction.	<b>Weather Watching</b> Activity 2-7	Pages 21-68

## Life Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
2.4.1.1.1 Describe and sort plants into groups in many ways,	<b>Classroom Plants</b> Activity 2, 8-9, 11	Pages 23-28, 73-86, 97-

according to their physical characteristics and behaviors.		104
2.4.2.1.1 Recognize that plants need space, water, food and air and fulfill these needs in different ways.	<b>Classroom Plants</b> Activity 3-5, 8 Reader <b>Plant and Animal Populations</b> Reader	Pages 29-53, 73-79 Pages 7-9  Pages 4-5
2.4.3.1.1 Describe the characteristics of plants at different stages of their life cycles.  <i>For example:</i> Use live organisms or pictures to observe the changes that occur during the life cycles of bean plants or marigolds.	<b>Classroom Plants</b> Activity 2-5, 9-10 Reader <b>Plant and Animal Populations</b> Activity 2	Pages 23-53, 81-95 Pages 5-6, 10-12  Pages 25-35

# Grade Three

## The Nature of Science and Engineering

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
<p>3.1.1.1.1 Provide evidence to support claims, other than saying “Everyone knows that,” or “I just know,” and discount such reasons when given by others.</p>	<p>DSM activities provide the opportunity for teachers to address this benchmark. See for example:  <b>Classroom Plants</b> Activity 5  <b>Using Your Senses</b> Activity 2  <b>Soil Science</b> Activity 11  <b>Dinosaurs and Fossils</b> Activity 6-7  <b>Magnets</b> Activity 2-4</p>	<p>Pages 47-53  Pages 23-30  Pages 99-115</p> <p>Page 47-60  Pages 19-34</p>
<p>3.1.1.2.1 Generate questions that can be answered when scientific knowledge is combined with knowledge gained from one’s own observations or investigations.</p> <p><i>For example:</i> Investigate the sounds produced by striking various objects.</p>	<p>DSM activities provide the opportunity for teachers to address this benchmark. See for example:  <b>Force and Motion</b> Activity 4-5  <b>Sink or Float</b> Activity 9-12  <b>Using Your Senses</b> Activity 6  <b>Food Chains and Webs</b> Activity 7-8  <b>Sound</b> Activity 9-11  <b>Water Cycle</b> Activity 4-6</p>	<p>Pages 47-55  Pages 75-107  Pages 53-60</p> <p>Pages 59-72  Pages 73-98  Pages 39-60</p>
<p>3.1.1.2.2 Recognize that when a science investigation is done the way it was done before, even in a different place, a similar result is expected.</p>	<p>DSM activities provide the opportunity for teachers to address this benchmark. See for example:  <b>Classroom Plants</b> Activity 5  <b>States of Matter</b> Activity 11-12  <b>Soil Science</b> Activity 10-12  <b>Electrical Circuits</b> Activity 3-4  <b>Magnets</b> Activity 9</p>	<p>Pages 47-53  Pages 89-101  Pages 91-114</p> <p>Pages 27-43  Pages 59-64</p>
<p>3.1.1.2.3 Maintain a record of observations, procedures and explanations, being careful to distinguish between actual observations and ideas about what was observed.</p> <p><i>For example:</i> Make a chart comparing observations about the structures of plants and animals.</p>	<p>DSM activities provide the opportunity for teachers to address this benchmark. See for example:  <b>Classroom Plants</b> Activity 5  <b>Plant and Animal Populations</b> Activity 8-9  <b>States of Matter</b> Activity 7, 11  <b>Food Chains and Webs</b> Activity 2-3  <b>Weather Instruments</b> Activity 1, 6  <b>Electrical Circuits</b> Activity 6-7</p>	<p>Pages 47-53</p> <p>Pages 77-93  Pages 57-63, 89-96</p> <p>Pages 23-37</p> <p>Pages 13-21, 51-57  Pages 51-62</p>
<p>3.1.1.2.4 Construct reasonable explanations based on evidence/data collected from observations or experiments.</p>	<p>DSM activities provide the opportunity for teachers to address this benchmark. See for example:  <b>Classroom Plants</b> Activity 5  <b>Soil Science</b> Activity 10  <b>Magnets</b> Activity 1</p>	<p>Pages 47-53  Pages 91-97  Pages 71-76</p>

	<b>Plant and Animal Populations</b> Activity 9 <b>Sound</b> Activity 9-11 <b>Food Chains and Webs</b> Activity 2-3	Pages 85-93 Pages 73-98  Pages 23-37
3.1.3.2.1 Understand that everybody can use evidence to learn about the natural world, identify patterns in nature, and develop tools.  <i>For example:</i> Ojibwe and Dakota knowledge and use of patterns in the stars to predict and plan.	This would need to be addressed at the local level. DSM activities provide ample opportunity to address this benchmark.	
3.1.3.2.2 Recognize that the practice of science and/or engineering involves many different kinds of work and engages men and women of all ages and backgrounds.	<b>Butterflies and Moths</b> Reader <b>States of Matter</b> Reader <b>Soil Science</b> Reader <b>Weather Instruments</b> Reader <b>Sound</b> Reader <b>Solar System</b> Reader <b>Food Chains and Webs</b> Reader	Page 14  Page 14  Page 15  Page 12  Page 14  Page 14  Page 13
3.1.3.4.1 Use tools, including rulers, thermometers, magnifiers and simple balances, to improve observations and keep a record of the observations made.	<b>Plant and Animal Populations</b> Activity 1-2 <b>Weather Watching</b> Activity 2 <b>Weather Instruments</b> Activity 1-5 <b>Dinosaurs and Fossils</b> Activity 6-7 <b>States of Matter</b> Activity 6-7 <b>Solar System</b> Activity 5-8	Pages 15-33 Pages 21-29  Pages 13-50  Pages 47-60 Pages 51-63 Pages 43-72

## Physical Science

BENCHMARK	DSM	PAGES
3.2.3.1.1 Explain the relationship between the pitch of a sound, the rate of vibration of the source and factors that affect pitch.  <i>For example:</i> Changing the length of a string that is plucked changes the pitch.	<b>Using Your Senses</b> Activity 6 Reader <b>Sound</b> Activity 8-11 Reader	Pages 53-60 Page 7  Pages 67-98 Pages 6-7
3.2.3.1.2 Explain how shadows can form in various ways.		
3.2.3.1.3 Describe how light travels in a straight line until it is absorbed, redirected, reflected or allowed to pass through an object.  <i>For example:</i> Use a flashlight, mirrors and water to demonstrate		

reflection and bending of light.		
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## Earth Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
3.3.3.1.1 Observe and describe the daily and seasonal changes in the position of the sun and compare observations.		
3.3.3.1.2 Recognize the pattern of apparent changes in the moon's shape and position.	<b>Solar System</b> Reader	Page 7
3.3.3.2.1 Demonstrate how a large light source at a great distance looks like a small light that is much closer.  <i>For example:</i> Car headlights at a distance look small compared to when they are close.		
3.3.3.2.2 Recognize that the Earth is one of several planets that orbit the sun, and that the moon orbits the Earth.	<b>Solar System</b> Activity 1-2, 6, 8  Reader	Pages 13-26, 51-58, 65-72 Pages 2-12

## Life Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
3.4.1.1.1 Compare how the different structures of plants and animals serve various functions of growth, survival and reproduction.  <i>For example:</i> Skeletons in animals and stems in plants provide strength and stability.	<b>Butterflies and Moths</b> Activity 1, 5, 9-10, 12  Reader <b>Classroom Plants</b> Activity 6-11 Reader <b>Plant and Animal Populations</b> Activity 1, 4-7, 10-11 Reader  <b>Food Chains and Webs</b> Activity 4-6 Reader <b>Plant and Animal Life Cycles</b> Activity 3-5, 8 Reader	Pages 15-21, 47-52, 79-95, 105-110 Pages 4-7  Pages 55-104 Pages 6-12  Pages 15-23, 43-76, 95-110 Pages 4-7  Pages 39-58 Pages 4-5  Pages 33-56, 75-82 Pages 3-12
3.4.1.1.2 Identify common groups of plants and animals using observable physical characteristics, structures and behaviors.  <i>For example:</i> Sort animals into groups such as mammals and amphibians based on physical characteristics.  <i>Another example:</i> Sort and identify common Minnesota trees based on leaf/needle	<b>Butterflies and Moths</b> Activity 12 Reader <b>Classroom Plants</b> Activity 8 <b>Food Chains and Webs</b> Activity 5, Science Challenge <b>Plant and Animal Life Cycles</b> Activity 5, Science Challenge Activity 9, Science Challenge Reader	Pages 105-110 Pages 4-7  Pages 73-79  Page 52  Page 56 Page 89 Pages 7-12

characteristics.		
<p>3.4.3.2.1 Give examples of likenesses between adults and offspring in plants and animals that can be inherited or acquired.</p> <p><i>For example:</i> Collect samples or pictures that show similarities between adults and their young offspring.</p>	<p><b>Butterflies and Moths</b> Activity 1-2, 9, 11</p> <p>Reader</p> <p><b>Classroom Plants</b> Reader</p> <p><b>Plant and Animal Populations</b> Activity 5</p> <p><b>Plant and Animal Life Cycles</b> Activity 3-6, 9-10</p> <p>Reader</p>	<p>Pages 15-30, 79-87, 97-104</p> <p>Pages 3, 8-13</p> <p>Page 5</p> <p>Pages 51-57</p> <p>Pages 33-63, 83-96</p> <p>Pages 2-3, 7-12</p>
<p>3.4.3.2.2 Give examples of differences among individuals that can sometimes give an individual an advantage in survival and reproduction.</p>	<p>DSM provides the opportunity to address this benchmark. See below:</p> <p><b>Plant and Animal Populations</b> Reader</p> <p><b>Classroom Plants</b> Activity 11</p> <p>Reader</p>	<p>Pages 5-7</p> <p>Pages 97-104</p> <p>Page 3</p>

# Grade Four

## The Nature of Science and Engineering

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
4.1.2.1.1 Describe the positive and negative impacts that the designed world has on the natural world as more and more engineered products and services are created and used.	<b>Water Cycle</b> Reader <b>Electrical Circuits</b> Reader <b>Magnets</b> Reader <b>Weather Instruments</b> Reader <b>Food Chains and Webs</b> Reader <b>Solar System</b> Reader	Pages 14-15 Pages 10-11, 14 Pages 11-12, 14-15 Page 12 Page 12 Page 15
4.1.2.2.1 Identify and investigate a design solution and describe how it was used to solve an everyday problem.  <i>For example:</i> Investigate different varieties of construction tools.	<b>Electrical Circuits</b> Activity 5, 9-11 Reader <b>Magnets</b> Activity 11 Reader	Pages 45-50, 71-88 Pages 3, 10-11  Pages 71-76 Pages 101-2
4.1.2.2.2 Generate ideas and possible constraints for solving a problem through engineering design.  <i>For example:</i> Design and build an electromagnet to sort steel and aluminum materials for recycling.	<b>Sound</b> Activity 12	Pages 99-105
4.1.2.2.3 Test and evaluate solutions, including benefits and drawbacks for the engineering solution, and communicate the results effectively.	<b>Sound</b> Activity 12	Pages 99-105
4.1.3.3.1 Describe a situation in which one invention led to other inventions.	<b>Magnets</b> Activity 11, Science, Technology and Society Reader <b>Electrical Circuits</b> Reader <b>Solar System</b> Activity 2, Science and Social Studies Activity 11, Science, Technology and Society	Page 76 Pages 10-13  Pages 12-13  Page 26  Page 100

## Physical Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
4.2.1.1.1 Measure temperature, volume, weight and length using appropriate tools and units.	<b>Dinosaurs and Fossils</b> Activity 6-7 <b>Weather Instruments</b> Activity 1 <b>Solar System</b> Activity 4-8	Pages 47-60  Pages 13-21 Pages 35-72
4.2.1.2.1 Distinguish between solids, liquids and gases in terms of shape and volume.  <i>For example:</i> Liquid water		

changes shape depending on the shape of its container.		
4.2.1.2.2 Describe how the states of matter change as a result of heating and cooling.	<b>Water Cycle</b> Activity 4-5, 8-9, 11-13  Reader <b>Weather Instruments</b> Activity 7, 9 Reader	Pages 39-51, 69-83, 91-114 Pages 8-11  Pages 59-66, 75-80 Page 6
4.2.3.1.1 Describe the transfer of heat energy when a warm and a cool object are touching or placed near each other.		
4.2.3.1.2 Describe how magnets can repel or attract each other and how they attract certain metal objects	<b>Magnets</b> Activity 1-2, 6 Reader	Pages 13-23, 41-45 Pages 1-5
4.2.3.1.3 Compare materials that are conductors and insulators of heat and/or electricity.  <i>For example:</i> Glass conducts heat well, but is a poor conductor of electricity.	<b>Electrical Circuits</b> Activity 6-7	Pages 51-62
4.2.3.2.1 Identify several ways to generate heat energy.  <i>For example:</i> Burning a substance, rubbing hands together, or electricity flowing through wires.	<b>Electrical Circuits</b> Activity 9-11 Reader	Pages 71-88 Pages 3-5
4.2.3.2.2 Construct a simple electrical circuit using wires, batteries and light bulbs.	<b>Electrical Circuits</b> Activity 1-4	Pages 13-43
4.2.3.2.3 Demonstrate how an electric current can produce a magnetic force.  <i>For example:</i> Construct an electromagnet to pick up paperclips.	<b>Magnets</b> Activity 10-11 Reader <b>Electrical Circuits</b> Reader	Pages 65-76 Page 10  Page 10

## Earth Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
4.3.1.3.1 Recognize that rocks may be uniform or made of mixtures of different minerals.	<b>Earth Movements</b> Reader	Page 15
4.3.1.3.2 Describe and classify minerals based on their physical properties.  <i>For example:</i> Streak, luster, hardness, reaction to vinegar.		
4.3.2.3.1 Identify where water collects on Earth, including atmosphere, ground and surface water, and describe how water moves through the Earth system	<b>Water Cycle</b> Activity 1-2, 8-9, 11-13  Reader	Pages 13-29, 69-89, 91-114 Pages 2-12

using the processes of evaporation, condensation and precipitation.		
4.3.4.1.1 Describe how the methods people utilize to obtain and use water in their homes and communities can affect water supply and quality.	<b>Water Cycle</b> Reader	Pages 14-15

### Life Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
4.4.4.2.1 Recognize that the body has defense systems against germs, including tears, saliva, skin and blood.		
4.4.4.2.2 Give examples of diseases that can be prevented by vaccination.		

# Grade Five

## The Nature of Science and Engineering

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
5.1.1.1.1 Explain why evidence, clear communication, accurate record keeping, replication by others, and openness to scrutiny are an essential part of doing science.	DSM activities and inquiry approach provide the opportunity for teachers to address this benchmark. See for example: <b>Pollution</b> Activity 10 <b>You and Your Body</b> Activity 3 <b>Erosion</b> Activity 7 <b>Electromagnetism</b> Activity 6 <b>Flight and Rocketry</b> Activity 9	Pages 71-76 Pages 27-31 Pages 59-66 Pages 43-48 Pages 91-97
5.1.1.1.2 Recognize that when scientific investigations are replicated they generally produce the same results, and when results differ significantly, it is important to investigate what may have caused such differences.  <i>For example:</i> Measurement Errors, equipment failures, or uncontrolled variables	DSM activities provide the opportunity for teachers to address this benchmark. See for example: <b>Simple Machines</b> Activity 3-4 <b>Color and Light</b> Activity 2-3 <b>Oceans</b> Activity 3 <b>Rocks and Minerals</b> Activity 9	Pages 25-37 Pages 19-35 Pages 31-41 Pages 35-54
5.1.1.1.3 Understand that different explanations for the same observations usually lead to making more observations and trying to resolve the differences.	DSM activities provide the opportunity for teachers to address this benchmark. See for example: <b>Simple Machines</b> Activity 3-4 <b>Erosion</b> Activity 5 <b>You and Your Body</b> Activity 9-11 <b>Flight and Rocketry</b> Activity 9 <b>Oceans</b> Activity 2-3 <b>Color and Light</b> Activity 2-3	Pages 25-37 Pages 43-49  Pages 67-84 Pages 91-97 Pages 23-41 Pages 29-43
5.1.1.1.4 Understand that different models can be used to represent natural phenomena and these models have limitations about what they can explain.  <i>For example:</i> Different kinds of maps of a region provide different information about the land surface.	<b>Oceans</b> Activity 5-10 <b>Erosion</b> Activity 2, 5-6, 9-12  <b>Weather Forecasting</b> Activity 9 <b>Rocks and Minerals</b> Activity 2, 9	Pages 55-124 Pages 21-27, 43-57, 75-104  Pages 69-74  Pages 21-28, 69-76
5.1.1.2.1 Generate a scientific question and plan an appropriate scientific investigation, such as systematic observations, field studies, open-ended exploration or controlled experiments to answer the question.	DSM activities provide the opportunity for teachers to address this benchmark. See for example: <b>Simple Machines</b> Activity 3-4 <b>Erosion</b> Activity 5 <b>You and Your Body</b>	Pages 25-37 Pages 43-49

	Activity 9-11 <b>Flight and Rocketry</b> Activity 9 <b>Oceans</b> Activity 2-3 <b>Color and Light</b> Activity 2-3	Pages 67-84 Pages 91-97 Pages 23-41 Pages 29-43
5.1.1.2.2 Identify and collect relevant evidence, make systematic observations and accurate measurements, and identify variables in a scientific investigation.	DSM activities provide the opportunity for teachers to address this benchmark. See for example: <b>Pollution</b> Activity 10 <b>You and Your Body</b> Activity 5 <b>Erosion</b> Activity 5 <b>Simple Machines</b> Activity 3 <b>Flight and Rocketry</b> Activity 9	Pages 71-76 Pages 41-48 Pages 43-49 Pages 25-31 Pages 91-97
5.1.1.2.3 Conduct or critique an experiment, noting when the experiment might not be fair because some of the things that might change the outcome are not kept the same, or that the experiment is not repeated enough times to provide valid results.	DSM provides the opportunity to address this benchmark during student discussions of activities. See for example: <b>Pollution</b> Activity 10 <b>You and Your Body</b> Activity 3 <b>Erosion</b> Activity 5	Pages 71-76 Pages 43-49 Pages 41-48
5.1.3.2.1 Describe how science and engineering influence and are influenced by local traditions and beliefs.  <i>For example:</i> Sustainable agriculture practices used by many cultures.	This would need to be addressed at the local level.	
5.1.3.4.1 Use appropriate tools and techniques in gathering, analyzing and interpreting data.  <i>For example:</i> Spring scale, metric measurements, tables, mean/median/range, spreadsheets, and appropriate graphs.	<b>Simple Machines</b> Activity 1-4 <b>Erosion</b> Activity 7 <b>You and Your Body</b> Activity 3, 5 <b>Weather Forecasting</b> Activity 3 <b>Oceans</b> Activity 2-3 <b>Electromagnetism</b> Activity 6	Pages 13-37 Pages 59-66  Pages 27-32, 41-48  Pages 25-32 Pages 23-41 Pages 43-48
5.1.3.4.2 Create and analyze different kinds of maps of the student's community and of Minnesota.  <i>For example:</i> Weather maps, city maps, aerial photos, regional maps or online map resources.	This would need to be addressed at the local level.	

## Physical Science

BENCHMARK	DSM	PAGES
5.2.2.1.1 Give examples of simple machines and describe how they change the input and output of forces and motion.	<b>Simple Machines</b> Activity 2, 5, 8-11 Reader	Pages 19-24, 39-47, 65-89 Pages 4-9
5.2.2.1.2 Identify the force that starts something moving or changes its speed or direction of	<b>Simple Machines</b> Activity 2-8 Reader <b>Flight and Rocketry</b>	Pages 19-69 Pages 2-9

motion. <i>For example:</i> Friction slows down a moving skateboard.	Activity 8-9, 11-12 Reader	Pages 81-97, 111-130 Pages 7, 10-13
5.2.2.1.3 Demonstrate that a greater force on an object can produce a greater change in motion.	<b>Simple Machines</b> Activity 3 <b>Flight and Rocketry</b> Activity 9	Pages 25-31 Pages 91-97

## Earth Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
5.3.1.2.1 Explain how, over time, rocks weather and combine with organic matter to form soil.	<b>Erosion</b> Reader	Page 7
5.3.1.2.2 Explain how slow processes, such as water erosion, and rapid processes, such as landslides and volcanic eruptions, form features of the Earth's surface.	<b>Erosion</b> Activity 1-2, 9-12 Reader	Pages 13-27, 75-104 Pages 4-13
5.3.4.1.1 Identify renewable and non-renewable energy and material resources that are found in Minnesota and describe how they are used.  <i>For example:</i> Water, iron ore, granite, sand and gravel, wind and forests.	This would need to be addressed at the local level.	
5.3.4.1.2 Give examples of how mineral and energy resources are obtained and processed and how that processing modifies their properties to make them more useful.  <i>For example:</i> Iron ore, biofuels, or coal.	<b>Rocks and Minerals</b> Activity 11 Reader	Pages 85-92 Pages 7-8, 11
5.3.4.1.3 Compare the impact of individual decisions on natural systems.  <i>For example:</i> Choosing paper or plastic bags impacts landfills as well as ocean life cycles.	<b>Pollution</b> Activity 2-3 Reader <b>Erosion</b> Reader	Pages 19-30 Pages 3, 5  Page 14

## Life Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
5.4.1.1.1 Describe how plant and animal structures and their functions provide an advantage for survival in a given natural system.  <i>For example:</i> Compare the physical characteristics of plants	<b>Oceans</b> Activity 10-12 Reader	Pages 113-142 Pages 12-13

<p>or animals from widely different environments, such as desert versus tropical, and explore how each has adapted to its environment.</p>		
<p>5.4.2.1.1 Describe a natural system in Minnesota, such as a wetland, prairie or garden, in terms of the relationships among its living and nonliving parts, as well as inputs and outputs.</p> <p><i>For example:</i> Design and construct a habitat for a living organism that meets its need for food, air and water.</p>	<p>This would need to be addressed at the local level.</p>	
<p>5.4.2.1.2 Explain what would happen to a system such as a wetland, prairie or garden if one of its parts were changed.</p> <p><i>For example:</i> Investigate how road salt runoff affects plants, insects and other parts of an ecosystem.</p> <p><i>Another example:</i> Investigate how an invasive species changes an ecosystem.</p>		
<p>5.4.4.1.1 Give examples of beneficial and harmful human interaction with natural systems.</p> <p><i>For example:</i> Recreation, pollution, or wildlife management.</p>	<p><b>Erosion</b> Reader <b>Pollution</b> Activity 1-3, 6, 9-10 Reader</p>	<p>Page 14 Pages 13-30, 47-52, 65-76 Pages 2-15</p>

# Grade Six

## The Nature of Science and Engineering

BENCHMARK	DSM	PAGES
<p>6.1.2.1.1 Identify a common engineered system and evaluate its impact on the daily life of humans.</p> <p><i>For example:</i> Refrigeration, cell phone or automobile.</p>	<p>DSM provides the opportunity for teachers to address this benchmark. See for example:</p> <p><b>Electromagnetism</b> Activity 10, Science and Social Studies Reader</p> <p><b>Simple Machines</b> Activity 8, Science, Technology and Society Reader</p> <p><b>Flight and Rocketry</b> Reader</p> <p><b>Newton's Toy Box</b> Reader</p> <p><b>Electrical Connections</b> Reader</p>	<p>Page 76 Pages 11-13, 15</p> <p>Page 69 Pages 10-11, 15</p> <p>Pages 8, 10-13</p> <p>Page 21</p> <p>Pages 14-16</p>
<p>6.1.2.1.2 Recognize that there is no perfect design and that new technologies have consequences that may increase some risks and decrease others.</p> <p><i>For example:</i> Seat belts and airbags.</p>	<p>DSM provides the opportunity for teachers to address this benchmark. See for example:</p> <p><b>Flight and Rocketry</b> Reader</p> <p><b>Electrical Connections</b> Reader</p> <p><b>Astronomy</b> Reader</p>	<p>Pages 10-12</p> <p>Pages 16-22</p> <p>Pages 18-20</p>
<p>6.1.2.1.3 Describe the trade-offs in using manufactured products in terms of features, performance, durability and cost.</p>	<p>DSM provides the opportunity for teachers to address this benchmark. See for example:</p> <p><b>You and Your Body</b> Reader</p> <p><b>Electromagnetism</b> Reader</p> <p><b>Simple Machines</b> Reader</p> <p><b>Electrical Connections</b> Reader</p>	<p>Page 12</p> <p>Page 15</p> <p>Pages 10-11</p> <p>Pages 16, 22</p>
<p>6.1.2.1.4 Explain the importance of learning from past failures, in order to inform future designs of similar products or systems.</p> <p><i>For example:</i> Space shuttle or bridge design.</p>	<p>DSM provides the opportunity for teachers to address this benchmark. See for example:</p> <p><b>Flight and Rocketry</b> Activity 2, Science and Social Studies Reader</p> <p><b>Astronomy</b> Reader</p>	<p>Page 32 Pages 4-6, 8, 10-13, 15</p> <p>Pages 18-20</p>
<p>6.1.2.2.1 Apply and document an engineering design process that includes identifying criteria and constraints, making representations, testing and</p>	<p>DSM provides the opportunity for teachers to address this benchmark. See for example:</p> <p><b>Flight and Rocketry</b> Activity 5, Reinforcement</p>	<p>Page 63</p>

<p>evaluation, and refining the design as needed to construct a product or system that solves a problem.</p> <p><i>For example:</i> Investigate how energy changes from one form to another by designing and constructing a simple roller coaster for a marble.</p>	<p><b>Simple Machines</b> Activity 12, Science Challenge <b>Newton's Toy Box</b> Activity 10, Science Challenge</p>	<p>Page 95 Page 72</p>
<p>6.1.3.1.1. Describe a system in terms of its subsystems and parts, as well as its inputs, processes and outputs.</p>	<p>DSM activities provide the opportunity for teachers to address this benchmark. See for example:</p> <p><b>You and Your Body</b> Activity 1-2, 4, 6-7 Reader <b>Oceans</b> Activity 5 <b>Flight and Rocketry</b> Activity 12 Reader <b>Electromagnetism</b> Activity 6-7 Reader <b>Simple Machines</b> Activity 5, 7-8 Reader <b>Newton's Toy Box</b> Activity 10-11, 13 Reader <b>Electrical Connections</b> Activity 2-4, 9-13 Reader</p>	<p>Pages 13-25, 33-39, 49-60 Pages 4-11 Pages 55-63 Pages 121-130 Pages 7-11 Pages 43-56 Pages 8-13 Pages 39-47, 57-69 Pages 10-12 Pages 67-77, 85-90 Pages 19-21 Pages 21-42, 75-106 Pages 7-16</p>
<p>6.1.3.1.2 Distinguish between open and closed systems.</p> <p><i>For example:</i> Compare mass before and after a chemical reaction that releases a gas in sealed and open plastic bags.</p>	<p>DSM activities provide the opportunity for teachers to address this benchmark. See for example:</p> <p><b>Oceans</b> Activity 5 <b>You and Your Body</b> Reader <b>Electromagnetism</b> Reader <b>Weather Forecasting</b> Reader <b>Astronomy</b> Reader <b>Electrical Connections</b> Activity 1-2, 9-13 Reader</p>	<p>Pages 55-63 Pages 6-9 Pages 9, 11, 13 Page 4 Pages 2-7 Pages 13-26, 75-106 Pages 7-10, 13-15</p>
<p>6.1.3.4.1 Determine and use appropriate safe procedures, tools, measurements, graphs and mathematical analyses to describe and investigate natural and designed systems in a</p>	<p><b>Flight and Rocketry</b> Safety Warning <b>Electromagnetism</b> Activity 6 <b>Simple Machines</b> Activity 1-5, 7-9</p>	<p>Page 126 Pages 43-48 Pages 13-47, 57-76</p>

physical science context.	<b>Color and Light</b> Activity 4-7 <b>Newton's Toy Box</b> Activity 7-9 <b>Electrical Connections</b> Activity 8-9 <b>Matter and Change</b> Activity 1-2	Pages 37-67  Pages 49-65  Pages 67-80  Pages 13-27
6.1.3.4.2 Demonstrate the conversion of units within the International System of Units (SI, or metric) and estimate the magnitude of common objects and quantities using metric units.	DSM activities provide the opportunity for teachers to address this benchmark. See for example: <b>You and Your Body</b> Activity 5 <b>Simple Machines</b> Activity 1-5 <b>Newton's Toy Box</b> Activity 7-9 <b>Earth, Moon and Sun</b> Activity 3-4 <b>Matter and Change</b> Activity 1-2	Pages 41-48  Pages 13-47  Pages 49-65  Pages 29-44  Pages 13-27

## Physical Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
6.2.1.1.1 Explain density, dissolving, compression, diffusion and thermal expansion using the particle model of matter.	<b>Matter and Change</b> Activity 1, 3 Reader	Pages 13-19, 29-35 Pages 9-12, 14-15
6.2.1.2.1 Identify evidence of physical changes, including changing phase or shape, and dissolving in other materials.	<b>Matter and Change</b> Activity 3 Reader	Pages 29-35 Pages 13-15
6.2.1.2.2 Describe how mass is conserved during a physical change in a closed system.  <i>For example:</i> The mass of an ice cube does not change when it melts.	DSM provides the opportunity to address this benchmark. See below: <b>Matter and Change</b> Activity 3 Reader	Pages 29-35 Pages 14-15
6.2.1.2.3 Use the relationship between heat and the motion and arrangement of particles in solids, liquids and gases to explain melting, freezing, boiling and evaporation.	<b>Matter and Change</b> Reader	Pages 91-2
6.2.2.1.1 Measure and calculate the speed of an object that is traveling in a straight line.	<b>Flight and Rocketry</b> Activity 5, Science and Math <b>Newton's Toy Box</b> Activity 7-9 Reader	Page 64  Pages 49-65 Page 3
6.2.2.1.2 For an object traveling in a straight line, graph the object's position as a function of time and an object's speed as a function of time. Explain how the	<b>Flight and Rocketry</b> Activity 5, Science and Math <b>Newton's Toy Box</b> Reader	Page 64  Pages 3, 5

graphs describe the object's motion.		
6.2.2.2.1 Recognize that when the forces acting on an object are balanced, the object remains at rest or continues to move at a constant speed in a straight line, and that unbalanced forces cause a change in the speed or direction of the motion of an object.	DSM provides the opportunity to address this benchmark. See below: <b>Flight and Rocketry</b> Activity 2, 8-12 Reader <b>Simple Machines</b> Activity 1-4, 7-9 Reader <b>Newton's Toy Box</b> Activity 1, 7-10 Reader	Pages 23-32, 81-130 Pages 3-4, 7, 9-11, 13  Pages 13-37, 57-76 Pages 10-12, 15  Pages 13-17, 49-72 Pages 4-13
6.2.2.2.2 Identify the forces acting on an object and describe how the sum of the forces affects the motion of the object.  <i>For example:</i> Forces acting on a book on a table or a car on the road.	DSM provides the opportunity to address this benchmark. See below: <b>Flight and Rocketry</b> Activity 2, 8-12 Reader <b>Simple Machines</b> Activity 1-4, 7-9 Reader <b>Newton's Toy Box</b> Activity 1, 3-13 Reader	Pages 23-32, 81-130 Pages 3-4, 7, 9-11, 13  Pages 13-37, 57-76 Pages 10-12, 15  Pages 13-17, 25-90 Pages 4-13
6.2.2.2.3 Recognize that some forces between objects act when the objects are in direct contact and others, such as magnetic, electrical and gravitational forces can act from a distance	<b>Electromagnetism</b> Activity 1-6 Reader <b>Flight and Rocketry</b> Activity 2, 8-9, 12  <b>Simple Machines</b> Activity 1-4 Reader <b>Newton's Toy Box</b> Activity 2-4 <b>Electrical Connections</b> Activity 11 Reader	Pages 13-48 Page 2-13  Pages 23-32, 81-97, 121-130  Pages 13-37 Pages 2, 4-9  Pages 19-38  Pages 89-94 Pages 11-14
6.2.2.2.4 Distinguish between mass and weight.	<b>Matter and Change</b> Reader <b>Newton's Toy Box</b> Activity 3 Reader	Page 13  Pages 25-31 Page 8
6.2.3.1.1 Describe properties of waves, including speed, wavelength, frequency and amplitude.		
6.2.3.1.2 Explain how the vibration of particles in air and other materials results in the transfer of energy through sound waves.		
6.2.3.1.3 Use wave properties of light to explain reflection,	<b>Color and Light</b> Reader	Pages 2-6, 8

refraction and the color spectrum.		
6.2.3.2.1 Differentiate between kinetic and potential energy and analyze situations where kinetic energy is converted to potential energy and vice versa.	<p>DSM provides the opportunity to address this benchmark. See below:</p> <p><b>Electromagnetism</b> Activity 9 Reader</p> <p><b>Flight and Rocketry</b> Activity 8-9, 12 Reader</p> <p><b>Simple Machines</b> Reader</p> <p><b>Newton's Toy Box</b> Activity 7-13 Reader</p>	<p>Pages 63-68 Pages 4-5</p> <p>Pages 81-97, 121-130 Pages 10-11,13</p> <p>Pages 3, 15</p> <p>Pages 49-90 Page 14</p>
<p>6.2.3.2.2 Trace the changes of energy forms, including thermal, electrical, chemical, mechanical or others as energy is used in devices.</p> <p><i>For example:</i> A bicycle, light bulb or automobile.</p>	<p>DSM provides the opportunity to address this benchmark. See below:</p> <p><b>Electromagnetism</b> Activity 5-10 Reader</p> <p><b>Flight and Rocketry</b> Activity 8-9, 12 Reader</p> <p><b>Simple Machines</b> Activity 5-7</p> <p><b>Electrical Connections</b> Activity 2-4, 9-13 Reader</p>	<p>Pages 37-76 Pages 4-5, 8-13</p> <p>Pages 81-97, 121-130 Pages 5-6, 10-11, 13</p> <p>Pages 39-63</p> <p>Pages 21-42, 75-106 Pages 7-10</p>
6.2.3.2.3 Describe how energy is transferred in conduction, convection and radiation.	<p>DSM provides the opportunity to address this benchmark. See below:</p> <p><b>Oceans</b> Activity 5</p> <p><b>Weather Forecasting</b> Reader</p>	<p>Pages 55-63</p> <p>Page 4</p>

# Grade Seven

## The Nature of Science and Engineering

BENCHMARK	DSM	PAGES
<p>7.1.1.1.1 Understand that prior expectations create bias when conducting scientific investigations. <i>For example:</i> Students continue to think that air is not matter, even though they have evidence from investigations.</p>	<p>DSM activities and the inquiry approach provide the opportunity for teachers to address this benchmark. See for example: <b>Earth Moon and Sun</b> Activity 3, 9 <b>Astronomy</b> Activity 2 <b>Newton's Toy Box</b> Activity 3</p>	<p>Pages 29-35, 81-92 Pages 23-29 Pages 25-31</p>
<p>7.1.1.1.2 Understand that when similar investigations give different results, the challenge is to judge whether the differences are significant, and if further studies are required. <i>For example:</i> Use mean and range to analyze the reliability of experimental results.</p>	<p>DSM activities provide the opportunity for teachers to address this benchmark. See for example: <b>Plants in Our World</b> Activity 3, 5-6 <b>Newton's Toy Box</b> Activity 7-9 <b>Matter and Change</b> Activity 1-2 <b>Electrical Connections</b> Activity 8-9</p>	<p>Pages 35-40, 49-60 Pages 49-65 Pages 13-27 Pages 67-80</p>
<p>7.1.1.2.1 Generate and refine a variety of scientific questions and match them with appropriate methods of investigation, such as field studies, controlled experiments, reviews of existing work and development of models.</p>	<p><b>Plants in Our World</b> Activity 3, 5-6 <b>DNA-From Genes to Proteins</b> Activity 6-8 <b>Matter and Change</b> Activity 11-13 <b>Electrical Connections</b> Activity 6-7 <b>Earth, Moon and Sun</b> Activity 3-4</p>	<p>Pages 35-40, 49-60 Pages 51-75 Pages 93-109 Pages 51-65 Pages 29-44</p>
<p>7.1.1.2.2 Plan and conduct a controlled experiment to test a hypothesis about a relationship between two variables, ensuring that one variable is systematically manipulated, the other is measured and recorded, and any other variables are kept the same (controlled). <i>For example:</i> The effect of various factors on the production of carbon dioxide by plants.</p>	<p><b>Plants in Our World</b> Activity 3, 5-6 <b>Matter and Change</b> Activity 12 <b>Electrical Connections</b> Activity 6-7 <b>Newton's Toy Box</b> Activity 6</p>	<p>Pages 35-40, 49-60 Pages 99-104 Pages 51-65 Pages 55-59</p>
<p>7.1.1.2.3 Generate a scientific conclusion from an investigation, clearly distinguishing between results (evidence) and conclusions (explanation).</p>	<p><b>Plants in Our World</b> Activity 3, 5-6 <b>Matter and Change</b> Activity 12 <b>Electrical Connections</b> Activity 6-7 <b>Newton's Toy Box</b> Activity 6</p>	<p>Pages 35-40, 49-60 Pages 99-104 Pages 51-65 Pages 55-59</p>
<p>7.1.1.2.4 Evaluate explanations</p>	<p>DSM activities and post-activity</p>	

proposed by others by examining and comparing evidence, identifying faulty reasoning, and suggesting alternative explanations.	discussions provide the opportunity for teachers to address this benchmark. See for example: <b>Plants in Our World</b> Activity 3, 5-6 <b>Newton's Toy Box</b> Activity 7-9 <b>Matter and Change</b> Activity 1-2 <b>Electrical Connections</b> Activity 8-9	Pages 35-40, 49-60 Pages 49-65  Pages 13-27  Pages 67-80
7.1.3.4.1 Use maps, satellite images and other data sets to describe patterns and make predictions about natural systems in a life science context. <i>For example:</i> Use online data sets to compare wildlife populations or water quality in regions of Minnesota.		
7.1.3.4.2 Determine and use appropriate safety procedures, tools, measurements, graphs and mathematical analyses to describe and investigate natural and designed systems in a life science context.	<b>Plants in Our World</b> Safety Alert Activity 1-6	Pages 83, 112 Pages 13-62

## Physical Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
7.2.1.1.1 Recognize that all substances are composed of one or more of approximately one hundred elements and that the periodic table organizes the elements into groups with similar properties.	<b>Matter and Change</b> Activity 4 Reader	Pages 37-44 Pages 4-5
7.2.1.1.2 Describe the differences between elements and compounds in terms of atoms and molecules.	<b>Matter and Change</b> Activity 4-5, 7 Reader	Pages 37-51. 63-68 Pages 4-8
7.2.1.1.3 Recognize that a chemical equation describes a reaction where pure substances change to produce one or more different substances whose properties are different from the original substance(s).	<b>Matter and Change</b> Activity 7 Reader	Pages 63-68 Page 18

## Life Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
7.4.1.1.1 Recognize that all cells do not look alike and that specialized cells in multicellular organisms are organized into tissues and organs that perform	<b>DNA-From Genes to Proteins</b> Activity 3-4 Reader <b>Plants in Our World</b> Activity 1-2, 4	Pages 25-39 Pages 2-3, 5-7  Pages 13-33, 41-47

specialized functions. <i>For example:</i> Nerve cells and skin cells do not look the same because they are part of different organs and have different functions.	Reader	Pages 2, 14-15
7.4.1.1.2 Describe how the organs in the respiratory, circulatory, digestive, nervous, skin and urinary systems interact to serve the needs of vertebrate organisms.		
7.4.1.2.1 Recognize that cells carry out life functions, and that these functions are carried out in a similar way in all organisms, including animals, plants, fungi, bacteria and protists.	<b>DNA-From Genes to Proteins</b> Reader	Pages 8-14
7.4.1.1.2 Recognize that cells repeatedly divide to make more cells for growth and repair.	<b>DNA-From Genes to Proteins</b> Activity 5 Reader	Pages 41-49 Pages 12-14
7.4.1.1.3 Use the presence of the cell wall and chloroplasts to distinguish between plant and animal cells. <i>For example:</i> Compare microscopic views of plant cells and animal cells.	<b>DNA-From Genes to Proteins</b> Reader <b>Plants in Our World</b> Activity 1 Reader	Pages 6-7 Pages 13-25 Page 2
7.4.2.1.1 Identify a variety of populations and communities in an ecosystem and describe the relationships among the populations and communities in a stable ecosystem.		
7.4.2.1.2 Compare and contrast the roles of organisms with the following relationships: predator/prey, parasite/host, and producer/consumer/decomposer.		
7.4.2.1.3 Explain how the number of populations an ecosystem can support depends on the biotic resources available as well as abiotic factors such as amount of light and water, temperature range and soil composition.		
7.4.2.2.1 Recognize that producers use the energy from sunlight to make sugars from carbon dioxide and water through a process called photosynthesis. This food can be used immediately, stored for later use, or used by other organisms.		
7.4.2.2.2 Describe the roles and		

relationships among producers, consumers and decomposers in changing energy from one form to another in a food web within an ecosystem.		
7.4.2.2.3 Explain that the total amount of matter in an ecosystem remains the same as it is transferred between organisms and their physical environment, even though its form and location change.  <i>For example:</i> Construct a food web to trace the flow of matter in an ecosystem.		
7.4.3.1.1 Recognize that cells contain genes and that each gene carries a single unit of information that either alone, or with other genes, determines the inherited traits of an organism.	DSM provides the opportunity to address this benchmark. See below <b>DNA-From Genes to Proteins</b> Activity 5 Reader	Pages 51-58 Pages 15-18
7.4.3.1.2 Recognize that in asexually reproducing organisms all the genes come from a single parent and that in sexually reproducing organisms half of the genes come from each parent.	<b>DNA-From Genes to Proteins</b> Reader	Pages 14, 18
7.4.3.1.3 Distinguish between characteristics of organisms that are inherited and those acquired through environmental influences.	DSM provides the opportunity to address this benchmark. See below. <b>DNA-From Genes to Proteins</b> Reader	Pages 15-20
7.4.3.2.1 Explain how the fossil record documents the appearance, diversification and extinction of many life forms.		
7.4.3.2.2 Use internal and external anatomical structures to compare and infer relationships between living organisms as well as those in the fossil record.		
7.4.3.2.3 Recognize that variation exists in every population and describe how a variation can help or hinder an organism's ability to survive.		
7.4.3.2.4 Recognize that extinction is a common event and it can occur when the environment changes and an organism's ability to adapt is insufficient to allow its survival.		
7.4.4.1.1 Describe examples where selective breeding has resulted in new varieties of cultivated plants and particular	<b>DNA-From Genes to Proteins</b> Reader	Page 20

traits in domesticated animals.		
7.4.4.1.2 Describe ways that human activities can change the populations and communities in an ecosystem.		
7.4.4.2.1 Explain how viruses, bacteria, fungi and parasites may infect the human body and interfere with normal body functions.		
7.4.4.2.2 Recognize that a microorganism can cause specific diseases and that there are a variety of medicines available that can be used to combat a given microorganism.		
7.4.4.2.3 Recognize that vaccines induce the body to build immunity to a disease without actually causing the disease itself.		
7.4.4.2.4 Recognize that the human immune system protects against microscopic organisms and foreign substances that enter from outside the body and against some cancer cells that arise from within.		

# Grade Eight

## The Nature of Science and Engineering

BENCHMARK	DSM	PAGES
<p>8.1.1.1.1 Evaluate the reasoning in arguments in which fact and opinion are intermingled or when conclusions do not follow logically from the evidence given.</p> <p><i>For example:</i> Evaluate the use of pH in advertising products related to body care or gardening.</p>	<p>DSM activities and post-activity discussions provide the opportunity for teachers to address this benchmark.</p>	
<p>8.1.1.2.1 Use logical reasoning and imagination to develop descriptions, explanations, predictions and models based on evidence.</p>	<p>DSM activities provide the opportunity for teachers to address this benchmark. See for example:</p> <p><b>Astronomy</b> Activity 1-5</p> <p><b>DNA-from Genes to Proteins</b> Activity 5</p> <p><b>Earth Processes</b> Activity 7-9, 11-12</p> <p><b>Newton’s Toy Box</b> Activity 2-5</p>	<p>Pages 13-60</p> <p>Pages 41-49</p> <p>Pages 63-87, 97-110</p> <p>Pages 19-43</p>
<p>8.1.3.2.1 Describe examples of important contributions to the advancement of science, engineering and technology made by individuals representing different groups and cultures at different times in history.</p>	<p><b>DNA-from Genes to Proteins</b> Activity 1, Science Challenge Activity 2, Science Challenge Reader</p> <p><b>Electrical Connections</b> Reader</p> <p><b>Newton’s Toy Box</b> Reader</p> <p><b>Matter and Change</b> Reader</p> <p><b>Earth, Moon and Sun</b> Reader</p>	<p>Page 17</p> <p>Page 29</p> <p>Page 21</p> <p>Page 21</p> <p>Page 22</p> <p>Page 21</p> <p>Page 20</p>
<p>8.1.3.3.1 Explain how scientific laws and engineering principles, as well as economic, political, social, and ethical expectations, must be taken into account in designing engineering solutions or conducting scientific investigations.</p>	<p>DSM activities provide ample opportunity for teachers to address this benchmark during post-activity discussions.</p>	
<p>8.1.3.3.2 Understand that scientific knowledge is always changing as new technologies and information enhance observations and analysis of data.</p> <p><i>For example:</i> Analyze how new telescopes have provided new information about the universe.</p>	<p><b>DNA-from Genes to Proteins</b> Reader</p> <p><b>Astronomy</b> Reader</p> <p><b>Matter and Change</b> Reader</p>	<p>Page 21</p> <p>Pages 16-23</p> <p>Page 22</p>

<p>8.1.3.3.3 Provide examples of how advances in technology have impacted the ways in which people live, work and interact.</p>	<p><b>Newton's Toy Box</b> Activity 7, Science, Technology and Society Reader <b>Electrical Connections</b> Activity 12, Science, Technology and Society Reader</p>	<p>Page 54 Page 11</p> <p>Page 99 Page 16, 22</p>
<p>8.1.3.4.1 Use maps, satellite images and other data sets to describe patterns and make predictions about local and global systems in Earth science contexts.</p> <p><i>For example:</i> Use data or satellite images to identify locations of earthquakes and volcanoes, ocean surface temperatures or weather patterns.</p>	<p><b>Astronomy</b> Activity 1-4 <b>Earth Processes</b> Activity 10</p>	<p>Pages 13-49</p> <p>Pages 89-95</p>
<p>8.1.3.4.2 Determine and use appropriate safety procedures, tools, measurements, graphs and mathematical analyses to describe and investigate natural and designed systems in Earth and physical science contexts.</p>	<p><b>Astronomy</b> Activity 6 <b>Electrical Connections</b> Activity 8-9 <b>Newton's Toy Box</b> Activity 2, 7-9 <b>Matter and Change</b> Activity 1-2 <b>Earth, Moon and Sun</b> Activity 3-4 <b>Earth Processes</b> Safety Alert</p>	<p>Pages 61-68</p> <p>Pages 67-80</p> <p>Pages 19-23, 49-65</p> <p>Pages 13-27</p> <p>Pages 29-44</p> <p>Page 51</p>

## Physical Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
<p>8.2.1.1.1 Distinguish between a mixture and a pure substance and use physical properties including color, solubility, density, melting point and boiling point to separate mixtures and identify pure substances.</p>	<p>DSM provides the opportunity to address this benchmark. See below: <b>Matter and Change</b> Activity 1, 3, 12  Reader</p>	<p>Pages 13-19, 28-35, 99-104 Pages 13-18</p>
<p>8.2.1.1.2 Use physical properties to distinguish between metals and non-metals.</p>	<p><b>Matter and Change</b> Reader</p>	<p>Pages 5-6</p>
<p>8.2.1.2.1 Identify evidence of chemical changes, including color change, generation of a gas, solid formation and temperature change.</p>	<p><b>Matter and Change</b> Activity 11-13 Reader</p>	<p>Pages 93-109 Page 17</p>
<p>8.2.1.2.2 Distinguish between chemical and physical changes in matter.</p>	<p><b>Matter and Change</b> Activity 3, 11-13 Reader</p>	<p>Pages 29-35, 93-109 Pages 13-19</p>
<p>8.2.1.2.3 Use the particle model of matter to explain how mass is conserved during physical and</p>	<p>DSM provides the opportunity to address this benchmark. See below:</p>	

chemical changes in a closed system.	<b>Matter and Change</b> Reader	Page 17
8.2.1.2.4 Recognize that acids are compounds whose properties include a sour taste, characteristic color changes with litmus and other acid/base indicators, and the tendency to react with bases to produce a salt and water.	<b>Matter and Change</b> Activity 10 Reader	Pages 85-92 Page 20
8.2.3.1.1 Explain how seismic waves transfer energy through the Earth and across its surfaces.	<b>Earth Processes</b> Activity 8 Reader	Pages 71-79 Page 9

## Earth Science

<i>BENCHMARK</i>	<i>DSM</i>	<i>PAGES</i>
8.3.1.1.1 Recognize that the Earth is composed of layers, and describe the properties of the layers, including the lithosphere, mantle and core.	<b>Earth Processes</b> Activity 2 Reader	Pages 23-28 Pages 2-3
8.3.1.1.2 Correlate the distribution of ocean trenches, mid-ocean ridges and mountain ranges to volcanic and seismic activity.	<b>Earth Processes</b> Activity 10, 13-14 Reader	Pages 89-95, 111-129 Pages 5-10
8.3.1.1.3 Recognize that major geological events, such as earthquakes, volcanic eruptions and mountain building, result from the slow movement of tectonic plates.	<b>Earth Processes</b> Activity 7-8, 10, 13-14  Reader	Pages 63-79, 89-95, 111-129 Pages 5-10
8.3.1.2.1 Explain how landforms result from the processes of crustal deformation, volcanic eruptions, weathering, erosion and deposition of sediment.	<b>Earth Processes</b> Activity 5, 7, 13  Reader	Pages 47-54, 63-67, 111-120 Pages 8-15
8.3.1.2.2 Explain the role of weathering, erosion and glacial activity in shaping Minnesota's current landscape.	This would need to be addressed at the local level. See also: <b>Earth Processes</b> Activity 3 Reader	Pages 29-37 Pages 11-15
8.3.1.3.1 Interpret successive layers of sedimentary rocks and their fossils to infer relative ages of rock sequences, past geologic events, changes in environmental conditions, and the appearance and extinction of life forms.	DSM provides the opportunity to address this benchmark. See below: <b>Earth Processes</b> Activity 4 Activity 4, Science Challenge Reader	Pages 39-46 Page 46 Page 22
8.3.1.3.2 Classify and identify rocks and minerals using characteristics including, but not limited to, density, hardness and streak for minerals; and texture	DSM provides the opportunity to address this benchmark. See below: <b>Earth Processes</b> Activity 4-6	Pages 39-67

and composition for rocks.	Reader	Pages 16-19
8.3.1.3.3 Relate rock composition and texture to physical conditions at the time of formation of igneous, sedimentary and metamorphic rock.	<b>Earth Processes</b> Activity 4-6 Reader	Pages 39-67 Pages 16-19
8.3.2.1.1 Explain how the combination of the Earth's tilted axis and revolution around the sun causes the progression of seasons.	<b>Earth, Moon and Sun</b> Activity 5 Reader <b>Astronomy</b> Activity 9	Pages 51-60 Pages 11-12  Pages 81-92
8.3.2.1.2 Recognize that oceans have a major effect on global climate because water in the oceans holds a large amount of heat.		
8.3.2.1.3 Explain how heating of the Earth's surface and atmosphere by the sun drives convection within the atmosphere and hydrosphere producing winds, ocean currents and the water cycle, as well as influencing global climate.		
8.3.2.2.1 Describe how the composition and structure of the Earth's atmosphere affects energy absorption, climate and distribution of particulates and gases. <i>For example:</i> Certain gases contribute to the greenhouse effect.		
8.3.2.2.2 Analyze changes in wind direction, temperature, humidity and air pressure and relate them to fronts and pressure systems.		
8.3.2.2.3 Relate global weather patterns to patterns in regional and local weather.		
8.3.2.3.1 Describe the location, composition and use of major water reservoirs on the Earth, and the transfer of water among them.		
8.3.2.3.2 Describe how the water cycle distributes materials and purifies water. <i>For example:</i> Dissolved gases in rain can change the chemical composition of substances on Earth. <i>Another example:</i> Waterborne disease.		

8.3.3.1.1 Recognize that the sun is a medium-sized star, one of billions of stars in the Milky Way galaxy, and the closest star to Earth.	<b>Earth, Moon and Sun</b> Reader <b>Astronomy</b> Reader	Page 4 Pages 8-9
8.3.3.1.2 Describe how gravity and inertia keep most objects in the solar system in regular and predictable motion.	<b>Earth, Moon and Sun</b> Reader <b>Newton's Toy Box</b> Reader	Page 5 Page 23
8.3.3.1.3 Recognize that gravity exists between any two objects and describe how the mass and distance between objects affect the force.	<b>Earth, Moon and Sun</b> Reader <b>Newton's Toy Box</b> Activity 2-3 Reader	Page 5 Pages 19-31 Page 8
8.3.3.1.4 Compare and contrast the sizes, locations and compositions of the planets and moons in our solar system.	<b>Earth, Moon and Sun</b> Activity 3-4 Reader <b>Astronomy</b> Activity 6 Reader	Pages 29-44 Pages 21-23 Pages 61-68 Pages 2-7
8.3.3.1.5 Use the predictable motions of the Earth around its own axis and around the sun, and the moon around the Earth, to explain day length, the phases of the moon, and eclipses.	<b>Earth, Moon and Sun</b> Activity 8, 10-11 Reader <b>Astronomy</b> Activity 2	Pages 71-79, 93-109 Pages 8-10, 14-15, 8-19 Pages 23-29
8.3.4.1.1 Describe how mineral and fossil fuel resources have formed over millions of years, and explain why these resources are finite and non-renewable over human time frames.	<b>Earth Processes</b> Activity 4, Science, Technology and Society Reader	Page 46 Page 18
8.3.4.1.2 Recognize that land and water use practices in specific areas affect natural processes and that natural processes interfere and interact with human systems.  <i>For example:</i> Levees change the natural flooding process of a river.  <i>Another example:</i> Agricultural runoff joins the water cycle and influences natural systems far from the source.		