

# DELTA SCIENCE MODULES

(DSM™)

Grades K-8

Correlation to

## Missouri Science Grade Level Expectations



# **Missouri Science Grade Level Expectations**

## **Correlation with Delta Science Modules (DSMä)**

**The following correlation of the Missouri Science Grade Level Expectations to the Delta Science Module (DSM) Program is to show representative examples of investigations and activities that address listed standards and the grade level expectations. A citation does not reflect all of the investigations or activities that might address a particular standard or grade level expectation.**

*November, 2005*

# GRADE K

## STRAND 1

### Properties and Principles of Matter and Energy

#### 1. Changes in properties and states of matter provide evidence of the atomic theory of matter

**Concept A: Objects, and the materials they are made of, have properties that can be used to describe and classify them**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Properties of Matter</i>		
a. Describe physical properties of objects (i.e., size, shape, color, mass) by using the senses, simple tools (e.g., magnifiers, equal arm balances), and/or nonstandard measures (e.g., bigger/smaller; more/less)	<b>Properties</b> Activity 1-11 Reader <b>Investigating Water</b> Activity 1-2, 5, 7 <b>From Seed to Plant</b> Activity 1 <b>How Do We Learn?</b> Activity 1-3	Pages 13-86 Pages 3-4, 6-8,11  Pages 13-26, 41-46, 55-61  Pages 15-20  Pages 13-35
b. Identify materials (e.g., cloth, paper, wood, rock, metal) that make up an object and some of the physical properties of the materials (e.g., color, texture, shiny/dull, odor, sound, taste, flexibility)	<b>Properties</b> Activity 7, 10-12 Reader <b>Investigating Water</b> Activity 5, 7 <b>From Seed to Plant</b> Activity 1	Pages 53-60, 75-93 Pages 8  Pages 41-46, 55-61  Pages 15-20
c. Sort objects based on observable physical properties (e.g., size, material, color, shape, mass)	<b>Properties</b> Activity 2-7, 10-13 Reader <b>Investigating Water</b> Activity 5, 7 <b>From Seed to Plant</b> Activity 1 <b>How Do We Learn?</b> Activity 2-3	Pages 19-60, 75-100 Pages 4, 8-11  Pages 41-46, 55-61  Pages 15-20  Pages 23-35

#### 2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems

**Concept A: Forms of energy have a source, a means of transfer (work and heat), and a receiver**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Investigating Sound</i>		
a. Identify the sounds and their source of vibrations in everyday life (e.g., alarms, car horns, animals, machines, musical instruments)	This expectation is addressed in the grade two module <u>Using Your Senses</u> .	
b. Compare different sounds	This expectation is addressed	

(i.e., loudness, pitch, rhythm)	in the grade two module <u>Using Your Senses</u> .	
c. Recognize that the ear serves as a receiver of sound	This expectation is addressed in the grade two module <u>Using Your Senses</u> .	

## STRAND 2

### Properties and Principles of Force and Motion

1. The motion of an object is described by its change in position relative to another object or point

**Concept A: The motion of an object is described as a change in position, direction, and speed relative to another object (frame of reference)**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Changes in Position</i>		
a. Describe an object's position relative to another object (e.g., above, below, in front of, behind)	<b>Properties</b> Activity 6, 10 <b>Sunshine and Shadows</b> Activity 2-5 Reader <b>Investigating Water</b> Activity 5, 8 <b>Finding the Moon</b> Activity 5	Pages 47-52, 75-80  Pages 19-48 Pages 8-9  Pages 41-46, 63-69  Pages 47-54

2. Forces affect motion

**Concept A: Forces are classified as either contact (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Changes in Position</i>		
a. Identify ways (push, pull) to cause some objects to move by touching them	<b>Investigating Water</b> Activity 2, 4, 6 <b>Finding the Moon</b> Activity 7	Pages 21-26, 35-40, 47-54  Page 63-69
b. Recognize magnets cause some objects to move without touching them	<b>Properties</b> Activity 11	Pages 81-86

## STRAND 3

### Characteristics and Interactions of Living Organisms

1. There is a fundamental unity underlying the diversity of all living organisms

**Concept D: Plants and animals have different structures that serve similar functions necessary for the survival of the organism**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Plants and Animals</i>		
a. Observe and compare the structures and behaviors of different kinds of plants and animals	<b>Observing an Aquarium</b> Activity 3-6, 8-9 Reader <b>From Seed to Plant</b>	Pages 31-67, 79-95 Pages 6-9

	Activity 2-6, 9-10 Reader	Pages 21-58, 73-84 Pages 3-9
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3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes

**Concept D: There is heritable variation within every species of organism**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Parent – Offspring Relationships</i>		
a. Recognize that living things have offspring	<b>Observing an Aquarium</b> Activity 10 Reader <b>From Seed to Plant</b> Activity 13 Reader	Pages 97-107 Pages 10-11  Pages 97-103 Pages 10-11
b. Recognize a parent – offspring relationship based on the organisms' physical similarities and differences	<b>Observing an Aquarium</b> Activity 10 Reader <b>From Seed to Plant</b> Activity 13 Reader	Pages 97-107 Pages 10-11  Pages 97-103 Pages 10-11

## STRAND 4

### Changes in Ecosystems and Interactions of Organisms with their Environments

1. Organisms are interdependent with one another and with their environment

**Concept A: All populations living together within a community interact with one another and with their environment in order to survive and maintain a balanced ecosystem**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Weather and Seasons</i>		
a. Describe how the seasons affect the behavior of plants and animals.		
b. Describe how the seasons affect the everyday life of humans (e.g., clothing, activities)	<b>Sunshine and Shadows</b> Reader	Page 13

## STRAND 5

### Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures

**Concept C: The atmosphere (air) is composed of a mixture of gases, including water vapor, and minute particles**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Weather and Seasons</i>		
a. Recognize moving air is felt as wind	<b>Sunshine and Shadows</b> Reader	Pages 13

	This expectation is addressed more fully in the grade two module <u>Weather Watching</u> .	
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**1. Earth’s systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes**

**Concept F: Constantly changing properties of the atmosphere occur in patterns which are described as weather**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Weather and Seasons</i>		
a. Observe and describe daily weather: precipitation (e.g., snow, rain, sleet, fog), wind (i.e., light breezes to strong wind), cloud cover, temperature	<b>Sunshine and Shadows</b> Reader This expectation is addressed more fully in the grade two module <u>Weather Watching</u> .	Page 13
b. Observe and describe the general weather conditions that occur during each season.	This expectation is addressed in the grade two module <u>Weather Watching</u> .	

**STRAND 6**  
**Composition and Structure of the Universe and  
the Motion of the Objects Within It**

**1. The universe has observable properties and structure**

**Concept A: The Earth, Sun, and moon are part of a larger system that includes other planets and smaller celestial bodies**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Objects in the Sky</i>		
a. Observe and describe the presence of the Sun, moon, and stars in the sky	<b>Finding the Moon</b> Activity 1, 3-5 Reader <b>Sunshine and Shadows</b> Activity 4-5 Reader	Pages 13-19, 29-54 Pages 2-10  Pages 33-48 Pages 2-4, 8-9
b. Recognize there are more stars in the sky than anyone can easily count, but they are not scattered evenly and vary in brightness		

**2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces**

**Concept A: The apparent position of the Sun and other stars, as seen from Earth, changes in observable patterns**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Objects in the Sky</i>		
a. Describe the Sun as only	<b>Finding the Moon</b>	

being seen in the daytime	Activity 1 Reader <b>Sunshine and Shadows</b> Activity 4, 6-7 Reader	Pages 13-19 Page 2  Pages 33-41, 49-63 Pages 2, 8-9
b. Recognize the Sun appears to move across the sky from morning to night	<b>Sunshine and Shadows</b> Activity 4, 6-7 Reader	Pages 33-41, 49-63 Pages 8-9

**Concept B: The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Objects in the Sky</i>		
a. Observe the moon can be seen sometimes at night and sometimes during the daytime	<b>Finding the Moon</b> Activity 1, 3-4 Reader	Pages 13-19, 29-46 Pages 3-10
b. Recognize the moon appears to change shape over the course of a month	<b>Finding the Moon</b> Activity 4, 9-10 Reader	Pages 39-46, 71-84 Pages 6-10

**Concept C: The regular and predictable motions of the Earth and moon relative to the Sun explain natural phenomena on Earth, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Weather and Seasons</i>		
a. Observe and describe the characteristics of the four seasons as they cycle through the year (summer, fall, winter, spring)	This expectation is addressed in the grade two module <u>Weather Watching</u> .	

## STRAND 7 Scientific Inquiry

**1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking**

**Concept A: Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Pose questions about objects, materials, organisms and events in the environment	DSM modules emphasize an inquiry approach. Students ask questions and seek answers. See for example: <b>From Seed to Plant</b> Activity 6, 8, 11 <b>Sunshine and Shadows</b> Activity 3-11 <b>Investigating Water</b> Activity 2-5, 7-8	Pages 53-58, 67-72, 85-90  Pages 27-88  Pages 21-46, 55-69

b. Conduct a simple investigation (fair test) to answer a question	<b>Properties</b> Activity 6-7, 10-11	Pages 47-60, 75-86
	<b>From Seed to Plant</b> Activity 6, 8, 11	Pages 53-58, 67-72, 85-90
	<b>Properties</b> Activity 10	Pages 75-80
	<b>Investigating Water</b> Activity 5, 7	Pages 41-46, 55-61

**Concept B: Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Make qualitative observations using the five senses	DSM modules emphasize student observation. See for example: <b>Finding the Moon</b> Activity 1-8 <b>Sunshine and Shadows</b> Activity 5-11 <b>Investigating Water</b> Activity 1-12 <b>Properties</b> Activity 1-13 <b>How Do We Learn?</b> Activity 1	Pages 13-76 Pages 43-88 Pages 13-100 Pages 13-100 Pages 13-35
b. Make observations using simple tools and equipment (e.g., magnifiers/hand lenses, magnets, equal arm balances, thermometers)	<b>From Seed to Plant</b> Activity 1-6 <b>Observing an Aquarium</b> Activity 3-6 <b>Investigating Water</b> Activity 5, 7 <b>Properties</b> Activity 6-7, 10-11	Pages 15-58 Pages 31-67 Pages 41-46, 55-61 Pages 47-60, 75-86
c. Measure length and mass using non-standard units	<b>Sunshine and Shadows</b> Activity 8, Science and Math <b>From Seed to Plant</b> Activity 7 <b>Properties</b> Activity 6 <b>How Do We Learn?</b> Activity 6-9	Page 70 Pages 59-66 Pages 47-52 Pages 51-79
d. Compare amounts/measurements	<b>Investigating Water</b> Activity 8 <b>From Seed to Plant</b> Activity 7 <b>Properties</b> Activity 6-7 <b>How Do We Learn?</b> Activity 8, 10	Pages 63-69 Pages 59-66 Pages 47-60 Pages 65-71, 81-86

**Concept C: Evidence is used to formulate explanations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Use observations as	DSM modules emphasize the	

support for reasonable explanations	use of evidence to formulate explanations. See for example: <b>Sunshine and Shadows</b> Activity 4-7 <b>From Seed to Plant</b> Activity 8, 11 <b>Investigating Water</b> Activity 5, 7-11 <b>Observing an Aquarium</b> Activity 10-11	Pages 33-63 Pages 67-72, 85-90 Pages 41-46, 55-94 Pages 97-116
b. Use observations to describe relationships and patterns and to make predictions to be tested	<b>Sunshine and Shadows</b> Activity 4-7 <b>From Seed to Plant</b> Activity 8, 11 <b>Investigating Water</b> Activity 5, 7 <b>Observing an Aquarium</b> Activity 10-11	Pages 33-63 Pages 67-72, 85-90 Pages 41-46, 55-61 Pages 97-116

**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Compare explanations with prior knowledge	DSM modules encourage evaluation of explanations. See for example: <b>Finding the Moon</b> Activity 3-5 <b>From Seed to Plant</b> Activity 8, 11 <b>Investigating Water</b> Activity 9-10 <b>Properties</b> Activity 10-11	Pages 29-54 Pages 67-72, 85-90 Pages 71-88 Pages 75-86

**Concept E: The nature of science relies upon communication of results and justification of explanations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Communicate observations using words, pictures, and numbers	DSM modules emphasize student communication. See for example: <b>Properties</b> Activity 2-7 <b>From Seed to Plant</b> Activity 7-12 <b>Investigating Water</b> Activity 8-12 <b>Observing an Aquarium</b> Activity 4-7	Pages 19-60 Pages 59-96 Pages 63-100 Pages 39-78

## STRAND 8

### Impact of Science, Technology and Human Activity

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs

**Concept A: Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Properties of Matter/Weather and Seasons</i> a. Recognize some objects occur in nature (natural objects); others have been designed and made by people	<b>Sunshine and Shadows</b> Activity 12 Reader <b>From Seed to Plant</b> Activity 1-5 Reader <b>Finding the Moon</b> Activity 1-2, 7-8 Reader <b>Observing an Aquarium</b> Activity 1-6 Reader <b>Properties</b> Activity 7-12 Reader	Pages 85-95 Pages 2-7 Pages 15-52 Pages 2-9 Pages 13-28, 63-76 Pages 2-14 Pages 15-67 Pages 2-12 Pages 53-93 Pages 2-13

**Concept B: Advances in technology often result in improved data collection and an increase in scientific information**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Properties of Matter/Plants and Animals</i> a. Describe how tools have helped scientists make better observations (i.e., magnifiers)	DSM activities provide the opportunity to teach this expectation. See for example: <b>Observing an Aquarium</b> Activity 3-6 <b>From Seed to Plant</b> Activity 1-6 <b>Properties</b> Activity 6-7, 11	Pages 31-67 Pages 15-58 Pages 47-60, 81-86

1. Science and technology affect, and are affected by, society

**Concept A: People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i> a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of individuals solving everyday problems or learning through discovery)	DSM modules provide opportunity to identify questions/problems and to solve them. See for example: <b>From Seed to Plant</b> Activity 6-8, 11 <b>Sunshine and Shadows</b> Activity 8-11 <b>Investigating Water</b>	Pages 53-72, 85-90 Pages 65-88

<p>b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally)</p>	<p>Activity 5, 7-9  Activity 9, Science Challenge  <b>Observing an Aquarium</b>  Activity 8-9</p> <p><b>From Seed to Plant</b>  Activity 6-8, 11  <b>Sunshine and Shadows</b>  Activity 8-11  <b>Investigating Water</b>  Activity 5, 7-9  Activity 9, Science Challenge  <b>Observing an Aquarium</b>  Activity 8-9</p>	<p>Pages 41-46, 55-80  Page 80</p> <p>Pages 79-95</p> <p>Pages 53-72, 85-90</p> <p>Pages 65-88</p> <p>Pages 41-46, 55-80  Page 80</p> <p>Pages 79-95</p>
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# GRADE ONE

## STRAND 1

### Properties and Principles of Matter and Energy

1. Changes in properties and states of matter provide evidence of the atomic theory of matter

**Concept A: Objects, and the materials they are made of, have properties that can be used to describe and classify them**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Properties of Matter: Mass and Temperature</i>		
a. Given an equal-arm balance and various objects, illustrate arrangements in which the beam is balanced	<b>Properties</b> Activity 6	Pages 47-52
b. Measure and compare the mass of objects (more/less)	<b>Properties</b> Activity 6 Activity 6, Science and Math	Pages 47-52 Page 52
c. Order objects according to mass	<b>Properties</b> Activity 6 Activity 6, Science and Math	Pages 47-52 Page 52

2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems

**Concept A: Forms of energy have a source, a means of transfer (work and heat), and a receiver**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Properties of Matter: Mass and Temperature</i>		
a. Identify the source of energy that causes an increase in the temperature of an object (e.g., Sun, stove, flame, light bulb)	<b>Sunshine and Shadows</b> Activity 2-3 <b>Investigating Water</b> Activity 9 Reader	Pages 19-32 Pages 71-80 Pages 8-11
b. Compare the temperature of hot and cold objects using a simple thermometer		
c. Describe the change in temperature of an object as warmer or cooler	<b>Investigating Water</b> Activity 9, 11 Reader	Pages 71-80, 89-94 Pages 4-9

**Concept C: Electromagnetic energy from the Sun (solar radiation) is a major source of energy on Earth**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Characteristics of Plants and</i>		

<i>Animals</i> a. Identify light from the Sun as a basic need of most plants	<b>From Seed to Plant</b> Activity 11 Reader	Pages 85-90 Page 8
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## STRAND 2

### Properties and Principles of Force and Motion

**1. The motion of an object is described by its change in position relative to another object or point**

**Concept A: The motion of an object is described as a change in position, direction, and speed relative to another object (frame of reference)**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Investigating Motion</i> a. Compare the position of an object relative to another object (e.g., left of or right of)	<b>Properties</b> Activity 6, 10 <b>Investigating Water</b> Activity 5, 8 <b>Sunshine and Shadows</b> Activity 2-5 Reader <b>Finding the Moon</b> Activity 5	Pages 47-52, 75-80 Pages 41-46, 63-69 Pages 19-48 Pages 8-9 Pages 47-54
b. Describe an object's motion as straight, circular, vibrational (back and forth), zigzag, stopping, starting, or falling	<b>Sunshine and Shadows</b> Activity 6-7 <b>Investigating Water</b> Activity 3, 6, 8	Pages 49-63 Pages 27-34, 47-54, 63-69
c. Compare the speeds (faster vs. slower) of two moving objects	<b>Investigating Water</b> Activity 8	Pages 63-69

**2. Forces affect motion**

**Concept A: Forces are classified as either contact (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude)**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Investigating Motion</i> a. Identify the force (i.e., push or pull) required to do work (move an object)	This expectation is addressed in the grade two module <u>Force and Motion</u> .	

**Concept D: Newton's Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Investigating Motion</i> a. Describe ways to change the motion of an object (i.e., how to cause an object to go slower, go	This expectation is addressed in the grade two module <u>Force and Motion</u> .	

faster, go farther, change direction, stop)		
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### STRAND 3

#### Characteristics and Interactions of Living Organisms

#### 1. There is a fundamental unity underlying the diversity of all living organisms

##### Concept A: Organisms have basic needs for survival

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Characteristics of Plants and Animals</i>		
a. Identify the basic needs of most animals (i.e., air, water, food, shelter)	<b>Observing an Aquarium</b> Activity 2 Reader <b>Finding the Moon</b> Activity 6	Pages 23-30 Pages 8-9, 12  Pages 55-61
b. Identify the basic needs of most plants (i.e., air, water, light)	<b>From Seed to Plant</b> Activity 2, 8, 11, 14  Reader <b>Observing an Aquarium</b> Activity 2	Pages 21-31, 67-71, 85-90, 105-109 Pages 4-5, 7-8, 12  Pages 23-30
c. Predict and investigate the growth of plants when growing conditions are altered (e.g., dark vs. light, water vs. no water)	<b>From Seed to Plant</b> Activity 8, 11	Pages 67-72, 85-90

##### Concept D: Plants and animals have different structures that serve similar functions necessary for the survival of the organism

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Characteristics of Plants and Animals</i>		
a. Identify and compare the physical structures of a variety of plants (e.g., stem, leaves, flowers, seeds, roots)	<b>From Seed to Plant</b> Activity 3-5, 9-10, 12 Reader	Pages 33-52, 73-84, 91-96 Pages 2-9, 14-15
b. Identify and compare the physical structures of a variety of animals (e.g., sensory organs, beaks, appendages, body covering) (Do NOT assess terms: sensory organs, appendages)	<b>Observing an Aquarium</b> Activity 4-6 Reader	Pages 39-67 Pages 4-9, 12
c. Identify the relationships between the physical structures of plants and the function of those structures (e.g., absorption of water,	<b>From Seed to Plants</b> Activity 3-4, 9-10, 12 Reader	Pages 33-44, 73-84, 91-96 Pages 3, 6-9

absorption of light energy, support, reproduction)		
d. Identify the relationships between the physical structures of animals and the function of those structures (e.g., taking in water, support, movement, obtaining food, reproduction)	<b>Observing an Aquarium</b> Activity 4-5 Reader	Pages 39-55 Pages 6-9

**Concept E: Biological classifications are based on how organisms are related**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Characteristics of Plants and Animals</i>		
a. Distinguish between plants and animals based on observable structures and behaviors)	DSM activities provide the opportunity to address this expectation. See for example: <b>Observing an Aquarium</b> Activity 2-10 Reader <b>From Seed to Plant</b> Activity 3-13 Reader	Pages 23-107 Pages 2-12 Pages 33-103 Pages 2-11, 14-15

**STRAND 4**  
**Changes in Ecosystems and Interactions of Organisms with their Environments**

**1. Organisms are interdependent with one another and with their environment**

**Concept A: All populations living together within a community interact with one another and with their environment in order to survive and maintain a balanced ecosystem**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Characteristics of Plants and Animals</i>		
a. Identify ways man depends on plants and animals for food, clothing, and shelter	<b>Observing an Aquarium</b> Activity 7, Science and Health Activity 7, Science and Social Studies Activity 9, Science and Social Studies  <b>From Seed to Plant</b> Activity 2, Science and Social Studies Activity 4, Science and Social Studies Reader	Page 78 Page 78 Page 95  Page 31 Page 44 Page 13

## STRAND 5

### Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes

**Concept F: Constantly changing properties of the atmosphere occur in patterns which are described as weather**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Observing Water and Weather</i>		
a. Observe, measure, record weather data throughout the year (i.e., cloud cover, temperature, precipitation, wind speed) by using thermometers, rain gauges, wind socks	This expectation is addressed in the grade two module <u>Weather Watching</u> .	
b. Compare temperatures in different locations (e.g., inside, outside, in the sun, in the shade)	This expectation is addressed in the grade two module <u>Weather Watching</u> .	
c. Compare weather data observed at different times throughout the year (e.g., hot vs. cold, cloudy vs. clear, types of precipitation, windy vs. calm)	This expectation is addressed in the grade two module <u>Weather Watching</u> .	
d. Recognize patterns indicating relationships between observed weather data and weather phenomena (e.g., temperature and types of precipitation, clouds and amounts of precipitation)	This expectation is addressed in the grade two module <u>Weather Watching</u> .	

3. Human activity is dependent upon and affects Earth's resources and systems

**Concept A: Earth's materials are limited natural resources affected by human activity**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Observing Water and Weather</i>		
a. Observe and describe ways water, both as a solid and liquid, is used in every day activities at different times of the year (e.g., bathe, drink, make ice cubes, build snowmen, cook, swim)	<b>Investigating Water</b> Activity 5, Science and Careers Activity 9, Science and Social Studies Activity 12, Science, Technology, and Society Reader	Page 46 Page 80 Page 100 Pages 7, 13, 15

## STRAND 6

### Composition and Structure of the Universe and the Motion of the Objects Within It

Not assessed at this level

## STRAND 7

### Scientific Inquiry

1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking

**Concept A: Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Pose questions about objects, materials, organisms, and events in the environment	DSM modules emphasize an inquiry approach. Students ask questions and seek answers. See for example: <b>From Seed to Plant</b> Activity 6, 8, 11 <b>Sunshine and Shadows</b> Activity 3-11 <b>Investigating Water</b> Activity 2-5, 7-8 <b>Properties</b> Activity 6-7, 10-11	Pages 53-58, 67-72, 85-90  Pages 27-88  Pages 21-46, 55-69  Pages 47-60, 75-86
b. Plan and conduct a simple investigation (fair test) to answer a question	<b>From Seed to Plant</b> Activity 6, 8, 11 <b>Properties</b> Activity 10 <b>Investigating Water</b> Activity 5, 7	Pages 53-58, 67-72, 85-90  Pages 75-80  Pages 41-46, 55-61

**Concept B: Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Make qualitative observations using the five senses	DSM modules emphasize student observation. See for example: <b>Finding the Moon</b> Activity 1-8 <b>Sunshine and Shadows</b> Activity 5-11 <b>Investigating Water</b> Activity 1-12 <b>Properties</b> Activity 1-13 <b>How Do We Learn?</b> Activity 1-3	Pages 13-76  Pages 43-88  Pages 13-100  Pages 13-100  Pages 13-35
b. Make observations using simple tools and	<b>From Seed to Plant</b> Activity 1-6	Pages 15-58

equipment (e.g., magnifiers/hand lenses, magnets, equal arm balances, thermometers)	<b>Observing an Aquarium</b> Activity 3-11 <b>Investigating Water</b> Activity 5, 7 <b>Properties</b> Activity 6-7, 10-11	Pages 31-67 Pages 41-46, 55-61 Pages 47-60, 75-86
c. Measure length, mass, and temperature using standard and non-standard units	<b>Sunshine and Shadows</b> Activity 8, Science and Math <b>From Seed to Plant</b> Activity 7 <b>Properties</b> Activity 6 <b>How Do We Learn?</b> Activity 6-9	Page 70 Pages 59-66 Pages 47-52 Pages 51-79
d. Compare amounts/measurements	<b>Investigating Water</b> Activity 8 <b>From Seed to Plant</b> Activity 7 <b>Properties</b> Activity 6-7 <b>How Do We Learn?</b> Activity 8, 10	Pages 63-69 Pages 59-66 Pages 47-60 Pages 65-71, 81-86

**Concept C: Evidence is used to formulate explanations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Use observations as support for reasonable explanations	DSM modules emphasize the use of evidence to formulate explanations. See for example: <b>Sunshine and Shadows</b> Activity 4-7 <b>From Seed to Plant</b> Activity 8, 11 <b>Investigating Water</b> Activity 5, 7-11 <b>Observing an Aquarium</b> Activity 10-11	Pages 33-63 Pages 67-72, 85-90 Pages 41-46, 55-94 Pages 97-116
b. Use observations to describe relationships and patterns and to make predictions to be tested	<b>Sunshine and Shadows</b> Activity 4-7 <b>From Seed to Plant</b> Activity 8, 11 <b>Investigating Water</b> Activity 5, 7 <b>Observing an Aquarium</b> Activity 10-11	Pages 33-63 Pages 67-72, 85-90 Pages 71-88 Pages 97-116

**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Compare explanations with prior knowledge	DSM modules encourage evaluation of explanations. See for example: <b>Finding the Moon</b> Activity 3-5	Pages 29-54

	<b>From Seed to Plant</b> Activity 8, 11 <b>Investigating Water</b> Activity 9-10 <b>Properties</b> Activity 10-11	Pages 67-72, 85-90  Pages 71-88  Pages 75-86
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**Concept E: The nature of science relies upon communication of results and justification of explanations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i> a. Communicate simple procedures and results of investigations and explanations through: oral presentations drawings and maps data tables graphs (bar, pictographs) writings	DSM modules emphasize student communication. See for example: <b>Properties</b> Activity 2-7 <b>From Seed to Plant</b> Activity 7-12 <b>Investigating Water</b> Activity 8-12 <b>Observing an Aquarium</b> Activity 4-7	   Pages 19-60  Pages 59-96  Pages 63-100  Pages 39-78

## STRAND 8

### Impact of Science, Technology and Human Activity

**1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs**

**Concept A: Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Properties of Matter/Weather and Seasons</i> a. Recognize some objects occur in nature (natural objects); others have been designed and made by people	<b>Sunshine and Shadows</b> Activity 12 Reader <b>From Seed to Plant</b> Activity 1-5 Reader <b>Finding the Moon</b> Activity 1-2, 7-8 Reader <b>Observing an Aquarium</b> Activity 1-6 Reader <b>Properties</b> Activity 7-12 Reader	   Pages 85-95 Pages 2-7  Pages 15-52 Pages 2-9  Pages 13-28, 63-76 Pages 2-14  Pages 15-67 Pages 2-12  Pages 53-93 Pages 2-13

**Concept B: Advances in technology often result in improved data collection and an increase in scientific information**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Properties of Matter/Characteristics of Plants and Animals</i> a. Describe how tools have	DSM activities provide the	

helped scientists make better observations (e.g., magnifiers, balances, thermometers)	opportunity to teach this expectation. See for example: <b>Observing an Aquarium</b> Activity 3-6 <b>From Seed to Plant</b> Activity 1-6 <b>Properties</b> Activity 6-7, 11	Pages 31-67  Pages 15-58  Pages 47-60, 81-86
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### 3. Science and technology affect, and are affected by, society

**Concept A: People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of individuals solving everyday problems or learning through discovery)	DSM modules provide opportunity to identify questions/problems and to solve them. See for example: <b>From Seed to Plant</b> Activity 6-8, 11 <b>Sunshine and Shadows</b> Activity 8-11 <b>Investigating Water</b> Activity 5, 7-9 Activity 9, Science Challenge <b>Observing an Aquarium</b> Activity 8-9	Pages 53-72, 85-90  Pages 65-88  Pages 41-46, 55-80 Page 80  Pages 79-95
b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally)	<b>From Seed to Plant</b> Activity 6-8, 11 <b>Sunshine and Shadows</b> Activity 8-11 <b>Investigating Water</b> Activity 5, 7-9 Activity 9, Science Challenge <b>Observing an Aquarium</b> Activity 8-9	Pages 53-72, 85-90  Pages 65-88  Pages 41-46, 55-80 Page 80  Pages 79-95

# GRADE TWO

## STRAND 1

### Properties and Principles of Matter and Energy

#### 1. Changes in properties and states of matter provide evidence of the atomic theory of matter

**Concept A: Objects, and the materials they are made of, have properties that can be used to describe and classify them**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Properties of Rocks and Soil</i>		
a. Describe and compare the physical properties of objects by using simple tools (i.e., thermometer, magnifier, centimeter ruler, balance, magnet)	<b>Soil Science</b> Activity 1-4 <b>Amazing Air</b> Activity 4-6 <b>Weather Watching</b> Activity 2-3 <b>States of Matter</b> Activity 6-7 <b>Length and Capacity</b> Activity 6, 11	Pages 15-37 Pages 35-57 Pages 29-44 Pages 15-63, 89-96 Pages 43-48, 83-88
b. Classify objects as “one kind of material” or a mixture	<b>Soil Science</b> Activity 4	Pages 37-44

**Concept B: Properties of mixtures depend upon the concentrations, properties, and interactions of particles**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Properties of Rocks and Soil</i>		
a. Observe and describe how mixtures are made by combining solids	<b>Soil Science</b> Reader	Page 2
b. Describe ways to separate the components of a mixture by their physical properties (e.g., sorting, magnets, screening)	<b>Soil Science</b> Activity 2	Pages 21-27

#### 2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems

**Concept A: Forms of energy have a source, a means of transfer (work and heat), and a receiver**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Forms of Energy: Sound</i>		
a. Recognize that sound travels through different mediums (i.e., air, water, solids)	<b>Using Your Senses</b> Activity 5, Science at Home	Page 51
b. Describe different ways to change the pitch of a sound (i.e., changes in	<b>Using Your Senses</b> Activity 6 Reader	Pages 53-60 Page 7

size, such as length or thickness/tension of the source)		
c. Describe how the ear serves as a receiver of sound (i.e., sound vibrates eardrum)	<b>Using Your Senses</b> Activity 5 Reader	Pages 45-52 Page 7

## STRAND 2

### Properties and Principles of Force and Motion

#### 2. Forces affect motion

**Concept A: Forces are classified as either contact (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude)**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Forces and Motion</i>		
a. Recognize magnets attract and repel each other and certain materials	This expectation is addressed in the grade one module <u>Properties</u> and the grade three module <u>Magnets</u> .	
b. Describe magnetism as a force that can push or pull other objects without touching them	This expectation is addressed in the grade one module <u>Properties</u> and the grade three module <u>Magnets</u> .	
c. Measure (using non-standard units) and compare the force (i.e., push or pull) required to overcome friction and move an object over different surfaces (i.e., rough, smooth)	<b>Force and Motion</b> Activity 4-5	Pages 41-55

**Concept B: Every object exerts a gravitational force on every other object**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Forces and Motion</i>		
a. Describe Earth's gravity as a force that pulls objects on or near the Earth toward the Earth without touching the object	<b>Force and Motion</b> Reader	Page 2

**Concept D: Newton's Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Forces and Motion</i>		
a. Describe the direction and amount of force (i.e., direction of push or pull, strong/weak push or pull) needed to change an object's motion (i.e.,	<b>Force and Motion</b> Activity 1-5, 8-9 <b>Amazing Air</b> Activity 10	Pages 13-55, 73-90  Pages 87-94

faster/slower, change in direction)		
b. Describe and compare the distances traveled by heavier/lighter objects after applying the same amount of force (i.e., push or pull) in the same direction		
c. Describe and compare the distances traveled by objects with the same mass after applying different amounts of force (i.e., push or pull) in the same direction		

**Concept F: Simple machines (levers, inclined planes, wheel and axle, pulleys) affect the force applied to an object and/or direction of movement as work is done**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Forces and Motion</i>		
a. Compare and describe the amount of force (i.e., more, less, or same push or pull) needed to raise an object to a given height, with or without using inclined planes (ramps) of different slopes	<b>Force and Motion</b> Activity 9 Reader	Pages 83-90 Page 9
b. Compare and describe the amount of force (i.e., more, less, or same push or pull) needed to raise an object to a given height, with or without using levers	<b>Force and Motion</b> Activity 3 Reader	Pages 31-39 Page 6
c. Apply the use of an inclined plane (ramp) and/or lever to different real life situations in which objects are raised	<b>Force and Motion</b> Activity 12 Activity 3, Science Extension Activity 9, Science Extension Reader	Pages 111-117 Page 39 Page 90 Pages 6-9

### STRAND 3

#### Characteristics and Interactions of Living Organisms

1. There is a fundamental unity underlying the diversity of all living organisms

**Concept B: Organisms progress through life cycles unique to different types of organisms**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Life Cycles of Animals</i>		
a. Recognize that animals progress through life cycles of birth, growth and	<b>Butterflies an Moths</b> Activity 1, 6, 9, 11	Pages 15-21, 53-59, 79-87, 97-104

development, reproduction, and death	Reader <b>Plant and Animal Populations</b> Activity 5	Pages 3, 8-13
b. Record observations on the life cycle of different animals (e.g., butterfly, frog, chicken)	<b>Butterflies an Moths</b> Activity 1, 6, 9, 11  <b>Plant and Animal Populations</b> Activity 5	Pages 51-57  Pages 15-21, 53-59, 79-87, 97-104  Pages 51-57
c. Sequence the stages in the life cycle of animals (i.e., butterfly, frog, chicken)	<b>Butterflies an Moths</b> Activity 1, 6, 9, 11  Reader	Pages 15-21, 53-59, 79-87, 97-104  Pages 3, 8-13

**3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes**

**Concept D: There is heritable variation within every species of organism**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Life Cycles of Animals</i>		
a. Identify and relate the similarities and differences between animal parents and their offspring	<b>Butterflies an Moths</b> Activity 1, 6, 9, 11  Reader <b>Plant and Animal Populations</b> Activity 5-6	Pages 15-21, 53-59, 79-87, 97-104 Pages 3, 8-13  Pages 51-67
b. Recognize similarities and differences among multiple offspring of an animal parent	<b>Plant and Animal Populations</b> Activity 5-6	Pages 51-67

## STRAND 4

### Changes in Ecosystems and Interactions of Organisms with their Environments

Not assessed at this level

## STRAND 5

### Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

**1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures**

**Concept A: The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Earth Materials: Rocks and Soils</i>		
a. Observe and describe the physical properties (e.g., odor, color, appearance,	<b>Soil Science</b> Activity 1-4, 7 Reader	Pages 15-44, 59-67 Pages 7-8

relative grain size, texture, absorption of water) and different components (i.e., sand, clay, humus) of soils		
b. Observe and describe the physical properties of rocks (e.g., size, shape, color, presence of fossils)	<b>Soil Science</b> Activity 5, Science Extension	Page 50

**2. Earth’s systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes**

**Concept A: The Earth’s materials and surface features are changed through a variety of external processes**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Earth Materials: Rocks and Soils</i>		
a. Observe and recognize examples of slow changes in the Earth’s surface and surface materials (e.g., rock, soil layers) due to processes such as decay (rotting), freezing, thawing, breaking, or wearing away by running water or wind	<b>Soil Science</b> Activity 5-6, 12 Reader	Pages 43-58, 107-114 Pages 4-6, 9

**3. Human activity is dependent upon and affects Earth’s resources and systems**

**Concept A: Earth’s materials are limited natural resources affected by human activity**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Earth Materials: Rocks and Soil</i>		
a. Observe and describe ways humans use Earth’s materials (e.g., soil, rocks) in daily life	<b>Soil Science</b> Activity 10, Science and Social Studies Reader	Page 97 Page 10

## STRAND 6

### Composition and Structure of the Universe and the Motion of the Objects Within It

Not assessed at this level

## STRAND 7

### Scientific Inquiry

**1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking**

**Concept A: Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation**

Grade Level Expectation	DSM	Page(s)
Scope and Sequence – All Units		
a. Pose questions about	DSM modules emphasize an	

objects, materials, organisms, and events in the environment	inquiry approach. Students ask questions and seek answers. See for example: <b>Classroom Plants</b> Activity 5 <b>Plant and Animal Populations</b> Activity 9 <b>Sink or Float</b> Activity 1-3 <b>States of Matter</b> Activity 5 <b>Amazing Air</b> Activity 6	Pages 47-53  Pages 85-93  Pages 13-34  Pages 41-50  Pages 51-57
b. Plan and conduct a simple investigation (fair test) to answer a question	<b>Classroom Plants</b> Activity 5 <b>Plant and Animal Populations</b> Activity 9 <b>Sink or Float</b> Activity 2-3 <b>States of Matter</b> Activity 5 <b>Soil Science</b> Activity 10	Pages 47-53  Pages 85-93  Pages 21-34  Pages 41-50  Pages 91-97

**Concept B: Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence - All Units</i>		
a. Make qualitative observations using the five senses	DSM modules emphasize student observation. See for example: <b>Soil Science</b> Activity 1-4 <b>States of Matter</b> Activity 1-3 <b>Using Your Senses</b> Activity 5-12 <b>Plant and Animal Populations</b> Activity 1-7	Pages 15-37  Pages 13-34  Pages 45-103  Pages 15-76
b. Make observations using simple tools and equipment (e.g., magnifiers/hand lenses, magnets, equal arm balances, thermometers)	<b>Soil Science</b> Activity 1-4 <b>Force and Motion</b> Activity 1-5 <b>States of Matter</b> Activity 6-7, 11 <b>Weather Watching</b> Activity 2-5, 7 <b>Length and Capacity</b> Activity 5-6, 10-11	Pages 15-37  Pages 13-55  Pages 51-63, 89-96  Pages 21-50, 61-68  Pages 37-48, 77-88
c. Measure length, mass, and temperature using standard and non-standard units	<b>Length and Capacity</b> Activity 1-6 <b>States of Matter</b> Activity 6-7, 11 <b>Amazing Air</b>	Pages 7-48  Pages 51-63, 89-96

d. Compare amounts/measurements	Activity 4, 6 <b>Weather Watching</b>	Pages 35-43, 51-57
	Activity 2-3 <b>Force and Motion</b>	Pages 21-36
	Activity 2	Pages 23-29
	<b>Amazing Air</b> Activity 4-5	Pages 35-49
	<b>States of Matter</b> Activity 7, 11	Pages 57-63, 89-96
	<b>Force and Motion</b> Activity 2, 4-5	Pages 23-29, 41-55
	<b>Length and Capacity</b> Activity 1-3	Pages 7-26, 59-88
	<b>Weather Watching</b> Activity 3	Pages 29-36

**Concept C: Evidence is used to formulate explanations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Use observations as support for reasonable explanations	DSM modules emphasize the use of evidence to formulate explanations. See for example: <b>Plant and Animal Populations</b>	
	Activity 9-11	Pages 85-110
	<b>Amazing Air</b> Activity 4-7	Pages 35-68
	<b>Sink or Float</b> Activity 2-3, 5, 7	Pages 21-31, 43-51, 61-66
	<b>Force and Motion</b> Activity 4-5	Pages 41-55
	<b>States of Matter</b> Activity 7, 11	Pages 57-63, 89-96
b. Use observations to describe relationships and patterns and to make predictions to be tested	<b>Classroom Plants</b> Activity 5	Pages 47-53
	<b>Amazing Air</b> Activity 4-5	Pages 35-49
	<b>Force and Motion</b> Activity 3	Pages 31-39
	<b>Plant and Animal Populations</b> Activity 8-9	Pages 85-93
	<b>Sink or Float</b> Activity 1-3	Pages 13-34

**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Compare explanations with prior knowledge	DSM modules encourage evaluation of explanations. See for example: <b>Using Your Senses</b>	
	Activity 12	Pages 97-103
	<b>Soil Science</b> Activity 1-12	Pages 91-114

	<b>Classroom Plants</b> Activity 5	Pages 47-53
	<b>Sink or Float</b> Activity 1-3	Pages 13-34
	<b>States of Matter</b> Activity 4-5	Pages 35-50

**Concept E: The nature of science relies upon communication of results and justification of explanations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Communicate simple procedures and results of investigations and explanations through: oral presentations drawings and maps data tables graphs (bar, pictographs) writings	DSM modules emphasize student communication. See for example: <b>Force and Motion</b> Activity 3-5 <b>Classroom Plants</b> Activity 5 <b>Using Your Senses</b> Activity 11-12 <b>Weather Watching</b> Activity 3-5 <b>Plant and Animal Populations</b> Activity 8-9	Pages 31-55 Pages 47-53 Pages 89-103 Pages 29-50 Pages 77-93

## STRAND 8

### Impact of Science, Technology and Human Activity

**1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs**

**Concept A: Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Forms of Energy: Sound</i>		
a. Design and construct a musical instrument using materials (e.g., cardboard, wood, plastic, metal) and/or existing objects (e.g., toy wheels, gears, boxes, sticks) that can be used to perform a task (Assess Locally)	<b>Using Your Senses</b> Activity 7, Science and the Arts This expectation is addressed more fully in the grade 3 module <u>Sound</u> .	Page 66

**Concept B: Advances in technology often result in improved data collection and an increase in scientific information**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Forms of Energy: Sound/Properties of Rocks and Soil</i>		
a. Describe how tools have helped scientists make better observations, measurements, or equipment for investigations (e.g.,	DSM modules provide the opportunity to teach this expectation. See for example: <b>Soil Science</b> Activity 1-4 <b>States of Matter</b>	Pages 15-37

magnifiers, balances, stethoscopes, thermometers)	Activity 6-7, 11 <b>Force and Motion</b> Activity 1-5 <b>Length and Capacity</b> Activity 5-6, 10-11	Pages 51-62, 89-96  Pages 13-55  Pages 27-48, 77-88
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### 3. Science and technology affect, and are affected by, society

**Concept A: People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of individuals solving everyday problems or learning through discovery)	DSM modules provide opportunity to identify questions/problems and to solve them. See for example: <b>Sink or Float</b> Activity 9-12 <b>Amazing Air</b> Activity 12 <b>Classroom Plants</b> Activity 5 <b>States of Matter</b> Activity 5 <b>Soil Science</b> Activity 10	  Pages 75-107  Pages 101-108  Pages 47-53  Pages 41-48  Pages 91-97
b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally)	<b>Sink or Float</b> Activity 9-12 <b>Amazing Air</b> Activity 12 <b>Classroom Plants</b> Activity 5 <b>States of Matter</b> Activity 5 <b>Soil Science</b> Activity 10	  Pages 75-107  Pages 101-108  Pages 47-53  Pages 41-48  Pages 91-97

# GRADE THREE

## STRAND 1

### Properties and Principles of Matter and Energy

1. Changes in properties and states of matter provide evidence of the atomic theory of matter

**Concept D: Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Investigating States of Matter</i>		
a. Compare the observable physical properties of solids, liquids, or gases (air) (i.e., visible vs. invisible, changes in shape, changes in the amount of space occupied)	<b>Amazing Air</b> Activity 1-6 <b>States of Matter</b> Activity 1-3 Reader <b>Sink or Float</b> Reader <b>Water Cycle</b> Reader	Pages 7-57  Pages 13-34 Pages 3-6  Pages 5-6  Page 8
b. Identify everyday objects/substances as solid, liquid, or gas (e.g., air, water)	<b>States of Matter</b> Activity 1-3 Reader <b>Amazing Air</b> Activity 1-3 <b>Sink or Float</b> Reader <b>Water Cycle</b> Activity 1 Reader <b>Looking at Liquids</b> Activity 1	Pages 13-34 Pages 3-6, 13  Pages 7-33  Pages 5-8  Pages 13-21 Pages 2-3, 8  Pages 7-14
c. Recognize water evaporates (liquid water changes into a gas as it moves into the air)	<b>States of Matter</b> Activity 8 Reader <b>Weather Watching</b> Reader <b>Water Cycle</b> Activity 4-6 Reader <b>Looking at Liquids</b> Activity 11 <b>Weather Instruments</b> Activity 7	Pages 65-72 Page 9  Pages 4-5  Pages 39-60 Pages 9-11  Pages 77-81  Pages 59-66
d. Measure and compare the temperature of water when it exists as a solid to its temperature when it exists as a liquid	<b>States of Matter</b> Activity 7	Pages 57-63
e. Investigate and recognize water can change from a liquid to a solid (freeze), and back again to a liquid (melt), as the result of	<b>States of Matter</b> Activity 7, 10 Reader <b>Water Cycle</b> Reader	Pages 57-63, 81-88 Pages 8-9  Pages 8-9

temperature changes		
f. Describe the changes in the physical properties of water (i.e., shape, volume) when frozen or melted	<b>States of Matter</b> Activity 7, 10 Reader <b>Water Cycle</b> Reader	Pages 57-63, 81-88 Pages 8-9  Pages 8-9
g. Predict and investigate the effect of heat energy (i.e., change in temperature, melting, evaporation) on objects and materials	<b>States of Matter</b> Activity 4, 7-8 <b>Water Cycle</b> Activity 4, 12 <b>Looking at Liquids</b> Activity 11 <b>Weather Instruments</b> Activity 7	Pages 35-40, 57-72  Pages 39-44, 99-106  Pages 77-81  Pages 59-66

**2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems**

**Concept A: Forms of energy have a source, a means of transfer (work and heat), and a receiver**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Investigating States of Matter</i>		
a. Identify sources of thermal energy (e.g., Sun, stove, fire, body) that can cause solids to change to liquids, and liquids to change to gas	<b>States of Matter</b> Activity 8 Reader <b>Water Cycle</b> Activity 4-5, 11 Reader <b>Weather Instruments</b> Activity 7 Reader	Pages 65-72 Page 9  Pages 39-51, 91-98 Pages 9-11  Pages 59-66 Page 6
<i>Scope and Sequence – Earth, Sun, and Moon</i>		
a. Identify sources of light energy (e.g., Sun, bulbs, flames)	<b>Electric Circuits</b> Activity 1, 9-10 Reader <b>Powders and Crystals</b> Activity 9 <b>Solar System</b> Reader <b>Water Cycle</b> Activity 11	Pages 13-17, 71-82 Pages 3-5  Pages 63-69  Page 3  Pages 91-98
b. Recognize light can be transferred from the source to the receiver (eye) through space	DSM modules provide the opportunity to teach this expectation. See for example: <b>Using Your Senses</b> Activity 1 Reader <b>Electric Circuits</b> Activity 1 <b>Solar System</b> Reader	Pages 13-21 Pages 4-5  Pages 13-17  Page 3
c. Identify the three things (light source, object, and	This expectation is addressed in the grade one module	

surface) necessary to produce a shadow	<u>Sunshine and Shadows.</u>	
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**STRAND 2**  
**Properties and Principles of Force and Motion**

Not assessed at this level

**STRAND 3**  
**Characteristics and Interactions of Living Organisms**

**1. There is a fundamental unity underlying the diversity of all living organisms**

**Concept A: Organisms have basic needs for survival**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Plants</i> a. Describe the basic needs of most plants (i.e., air, water, light, nutrients, temperature)	<b>Classroom Plants</b> Activity 5 Reader <b>Plant and Animal Populations</b> Reader <b>Food Chains and Webs</b> Activity 3	Pages 47-53 Pages 7-9  Page 4  Pages 31-37

**Concept B: Organisms progress through life cycles unique to different types of organisms**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Plants</i> a. Recognize plants progress through life cycles of seed germination, growth and development, reproduction, and death	<b>Classroom Plants</b> Reader <b>Plant and Animal Life Cycles</b> Activity 2, 6, 9 Reader	Page 5  Pages 23-32, 57-63, 83-89 Pages 2-6
c. Sequence and describe the stages in the life cycle of a flowering plant	<b>Classroom Plants</b> Reader <b>Plant and Animal Life Cycles</b> Activity 2, 6, 9 Reader	Page 5  Pages 23-32, 57-63, 83-89 Pages 2-6

**Concept D: Plants and animals have different structures that serve similar functions necessary for the survival of the organism**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Plants</i> a. Identify the major organs (roots, stems, flowers, leaves) and their functions in vascular plants (e.g., absorption, transport, reproduction) (Do NOT assess the term vascular)	<b>Classroom Plants</b> Activity 6-9 Reader <b>Plant and Animal Life Cycles</b> Activity 8 Reader	Pages 55-86, Pages 6-12  Pages 75-82 Pages 3-6

**2. Living organisms carry out life processes in order to survive**

**Concept C: Complex multicellular organisms have systems that interact to carry out life processes through physical and chemical means**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Plants</i> a. Illustrate and trace the	<b>Classroom Plants</b>	

path of water and nutrients as they move through the transport system of a plant	Activity 6-7 Reader	Pages 55-71 Pages 7-8
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**3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes**

**Concept D: There is heritable variation within every species of organism**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Plants</i>		
a. Identify and relate the similarities and differences between plants and their offspring (i.e., seedlings)	<b>Classroom Plants</b> Activity 3-4 Reader <b>Plant and Animal Life Cycles</b> Activity 2, 6 Reader	Pages 23-37 Page 5  Pages 23-32, 57-63 Page 2

**STRAND 4**  
**Changes in Ecosystems and Interactions of Organisms with their Environments**

**2. Matter and energy flow through an ecosystem**

**Concept A: As energy flows through the ecosystem, all organisms capture a portion of that energy and transform it to a form they can use**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Food Chains</i>		
a. Identify sunlight as the primary source of energy plants use to produce their own food	<b>Classroom Plants</b> Activity 5, 8 Reader <b>Plant and Animal Populations</b> Reader <b>Food Chains and Webs</b> Activity 3 Reader	Pages 47-53, 73-79 Page 9  Pages 4, 12  Pages 31-37 Page 6
b. Classify populations of organisms as producers or consumers by the role they serve in the ecosystem	<b>Plant and Animal Populations</b> Reader <b>Food Chains and Webs</b> Activity 10-12 Reader <b>Insect Life</b> Activity 10	Pages 12-13  Pages 81-101 Pages 6-9  Pages 67-71
c. Sequence the flow of energy through a food chain beginning with the Sun	<b>Plant and Animal Populations</b> Reader <b>Food Chains and Webs</b> Activity 3-12 Reader <b>Insect Life</b> Activity 10	Pages 12-13  Pages 31-110 Pages 6-9  Pages 67-71
d. Predict the possible effects of removing an organism from a food	DSM modules provide the opportunity to teach this expectation. See for example:	

chain	<b>Plant and Animal Populations</b> Reader <b>Food Chains and Webs</b> Activity 3-12 Reader <b>Insect Life</b> Activity 10	Pages 12-13  Pages 31-110 Pages 6-9  Pages 67-71
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## STRAND 5

### Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures

**Concept C: The atmosphere (air) is composed of a mixture of gases, including water vapor, and minute particles**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Investigating States of Matter</i>		
a. Recognize liquid water can change into a gas (vapor) in the air	<b>States of Matter</b> Activity 8 Reader <b>Weather Watching</b> Reader <b>Weather Instruments</b> Activity 7 <b>Water Cycle</b> Activity 4-6 Reader <b>Looking at Liquids</b> Activity 11	Pages 65-72 Page 9  Page 5  Pages 59-66  Pages 39-60 Pages 9-11  Pages 77-81
b. Recognize clouds and fog are made of tiny droplets of water	<b>Weather Watching</b> Activity 6 Reader <b>Water Cycle</b> Activity 9 Reader <b>Weather Instruments</b> Activity 9 Reader	Pages 51-59 Pages 4-5  Pages 73-83 Pages 10-12  Pages 75-80 Pages 6
c. Recognize air is a substance that surrounds us, takes up space, and moves around us as wind	<b>Amazing Air</b> Activity 1-3 <b>Weather Watching</b> Reader <b>Weather Instruments</b> Activity 1-2 Reader	Pages 7-33  Page 3  Pages 13-29 Page 2

2. Earth's Systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes

**Concept E: Changes in the form of water as it moves through Earth's systems are described as the water cycle**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Investigating States of Matter</i>		

a. Describe clouds and precipitation as forms of water	<b>Weather Watching</b> Activity 6-7 Reader <b>Weather Instruments</b> Activity 9-11 Reader <b>Water Cycle</b> Activity 9 Reader	Pages 51-68 Pages 4-5  Pages 75-96 Page 6  Pages 77-83 Pages 10-11
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## STRAND 6

### Composition and Structure of the Universe and the Motion of the Objects Within It

#### 1. The universe has observable properties and structure

**Concept A: The Earth, Sun, and moon are part of a larger system that includes other planets and smaller celestial bodies**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Earth, Sun, and Moon</i>		
a. Describe our Sun as a star because it provides light energy to the solar system	<b>Solar System</b> Activity 1-2 Reader	Pages 13-26 Pages 2-3
b. Recognize the moon is a reflector of light	<b>Solar System</b> Reader	Page 7

#### 2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces

**Concept A: The apparent position of the Sun and other stars, as seen from Earth, change in observable patterns**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Earth, Sun, and Moon</i>		
a. Illustrate and describe how the Sun appears to move slowly across the sky from east to west during the day	<b>Solar System</b> Activity 9 Reader	Pages 73-81 Page 6

**Concept B: The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Earth, Sun, and Moon</i>		
a. Illustrate and describe how the moon appears to move slowly across the sky from east to west during the day and/or night	<b>Solar System</b> Reader This expectation is address in the grade one module <u>Finding the Moon</u> .	Page 7
b. Observe the change in the moon's appearance relative to time of day and month over several months and note the	<b>Solar system</b> Reader This expectation is address in the grade one module <u>Finding the Moon</u> .	Page 7

pattern in this change		
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**Concept C: The regular and predictable motions of the Earth and moon relative to the Sun explain natural phenomena on Earth, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Earth, Sun, and Moon</i>		
a. Recognize there is a day/night cycle Every 24 hours	<b>Solar System</b> Activity 9 Reader	Pages 73-81 Page 6
b. Describe the changes in length and position (direction) of shadows from morning to midday to afternoon	This expectation is address in the grade one module <u>Sunshine and Shadows</u> .	
c. Describe how the Sun’s position in the sky changes the length and position of shadows	This expectation is address in the grade one module <u>Sunshine and Shadows</u> .	

## STRAND 7 Scientific Inquiry

**1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking**

**Concept A: Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Pose questions about objects, materials, organisms, and events in the environment	DSM modules emphasize an inquiry approach. Students ask questions and seek answers. See for example: <b>Classroom Plants</b> Activity 5 <b>Sink or Float</b> Activity 1-3 <b>States of Matter</b> Activity 5 <b>Sound</b> Activity 9-11 <b>Magnets</b> Activity 2-4 <b>Animal Behavior</b> Activity 3-4	Pages 47-53 Pages 13-34 Pages 41-50 Pages 73-98 Pages 19-34 Pages 19-44
b. Plan and conduct a fair test to answer a question	<b>Soil Science</b> Activity 10 <b>Sink or Float</b> Activity 2-3 <b>Classroom Plants</b> Activity 5 <b>Animal Behavior</b> Activity 3-6	Pages 91-97 Pages 21-34 Page 47-53 Pages 19-44

	<b>Insect Life</b> Activity 8	Page 55-60
	<b>Food Chains and Webs</b> Activity 3	Pages 31-37

**Concept B: Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence - All Units</i>		
a. Make qualitative observations using the five senses	DSM modules emphasize student observation. See for example: <b>Soil Science</b> Activity 1-4 <b>Using Your Senses</b> Activity 5-12 <b>States of Matter</b> Activity 1-3 <b>Plant and Animal Life Cycles</b> Activity 1 <b>Earth Movements</b> Activity 3-4 <b>Sound</b> Activity 1-2	Pages 15-37 Pages 45-63 Pages 13-34 Pages 15-21 Pages 29-46 Pages 13-38
b. Make observations using simple tools and equipment (e.g., hand lenses, magnets, thermometers, metric rulers, balances, graduated cylinders)	<b>States of Matter</b> Activity 6-7, 11 <b>Weather Watching</b> Activity 2-5 <b>Soil Science</b> Activity 1-4 <b>Dinosaurs and Fossils</b> Activity 6-7 <b>Water Cycle</b> Activity 7 <b>Weather Instruments</b> Activity 1-5	Pages 51-63, 89-96 Pages 21-50, 61-68 Pages 15-34 Pages 47-60 Pages 61-67 Pages 13-50
c. Measure length to the nearest centimeter, mass using grams, temperature using degrees Celsius, volume using liters	<b>States of Matter</b> Activity 6-7, 11 <b>Weather Watching</b> Activity 2-3 <b>Solar System</b> Activity 5-7 <b>Dinosaurs and Fossils</b> Activity 6-7 <b>Measuring</b> Activity 5-7, 10, 12	Pages 51-63, 89-96 Pages 21-36 Pages 43-64 Pages 47-60 Pages 37-56, 71-78, 87-95
d. Compare amounts/measurements	<b>Amazing Air</b> Activity 4-5 <b>States of Matter</b> Activity 7, 11 <b>Force and Motion</b> Activity 2, 4-5 <b>Dinosaurs and Fossils</b> Activity 6-7 <b>Solar System</b> Activity 6 <b>Weather Instruments</b>	Pages 35-49 Pages 57-63, 89-96 Pages 23-29, 41-55 Pages 47-60 Pages 51-58

e. Judge whether measurements and computation of quantities are reasonable	Activity 6	Pages 51-57
	<b>Force and Motion</b> Activity 4-5	Pages 41-55
	<b>States of Matter</b> Activity 7, 11	Pages 57-63, 89-96
	<b>Weather Instruments</b> Activity 6	Pages 51-57
	<b>Solar System</b> Activity 6	Pages 51-58
	<b>Dinosaurs and Fossils</b> Activity 6-7	Pages 47-60

**Concept C: Evidence is used to formulate explanations**

Grade Level Expectation	DSM	Page(s)	
<i>Scope and Sequence - All Units</i>			
a. Use quantitative and qualitative data as support for reasonable explanations	DSM modules emphasize the use of evidence to formulate explanations. See for example:		
	<b>Force and Motion</b> Activity 4-5	Pages 41-55	
	<b>Plant and Animal Populations</b> Activity 9-11	Pages 85-110	
	<b>States of Matter</b> Activity 7, 11	Pages 57-63, 89-96	
	<b>Electric Circuits</b> Activity 6-7	Pages 51-62	
	<b>Magnets</b> Activity 10-11	Pages 65-76	
	<b>Sound</b> Activity 9-11	Pages 73-98	
	b. Use data as support for observed patterns and relationships, and to make predictions to be tested	<b>Classroom Plants</b> Activity 5	Pages 47-53
		<b>Amazing Air</b> Activity 4-5	Pages 35-49
		<b>Sink or Float</b> Activity 1-3	Pages 13-34
<b>Sound</b> Activity 9-11		Pages 73-98	
<b>Electric Circuits</b> Activity 6-7		Pages 51-62	
	<b>Weather Instruments</b> Activity 6	Pages 51-57	

**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Evaluate the reasonableness of an explanation	DSM modules encourage evaluation of explanations. See for example:	
	<b>Classroom Plants</b> Activity 5	Pages 47-53
	<b>Soil Science</b> Activity 10-12	Pages 91-114
	<b>Sink or Float</b>	

b. Analyze whether evidence supports proposed explanations	Activity 1-3 <b>Dinosaurs and Fossils</b>	Pages 13-34
	Activity 6-7 <b>Earth Movements</b>	Pages 47-60
	Activity 3 <b>Water Cycle</b>	Pages 29-37
	Activity 6	Pages 53-60
	<b>Classroom Plants</b>	
	Activity 5	Pages 47-53
	<b>Amazing Air</b>	
	Activity 4-5	Pages 35-49
	<b>Force and Motion</b>	
	Activity 3	Pages 31-99
<b>Food Chains and Webs</b>		
Activity 3	Pages 31-37	
<b>Animal Behavior</b>		
Activity 3-6	Pages 19-44	
<b>Earth Movements</b>		
Activity 12	Pages 105-110	

**Concept E: The nature of science relies upon communication of results and justification of explanations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Communicate simple procedures and results of investigations and explanations through: oral presentations drawings and maps data tables graphs (bar, single line, pictograph) writings	DSM modules emphasize student communication. See for example: <b>Plant and Animal Populations</b>	
	Activity 8-9	Pages 77-93
	<b>Weather Watching</b>	
	Activity 3-5	Pages 29-50
	<b>Using Your Senses</b>	
	Activity 11-12	Pages 89-103
	<b>Solar System</b>	
	Activity 6, 8	Pages 51-58, 65-72
<b>Plant and Animal Life Cycles</b>		
Activity 6-9	Pages 57-89	
<b>Weather Instruments</b>		
Activity 6-7	Pages 51-66	

## STRAND 8

### Impact of Science, Technology and Human Activity

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs

**Concept A: Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Investigating States of Matter/ Earth, Sun, and Moon</i>		
a. Recognize some objects or materials (e.g., Sun, fire, ice, snow) occur in nature (natural objects); others (e.g., stoves,	<b>Solar System</b>	
	Activity 1	Pages 13-20
	Reader	Pages 2-13
	<b>Earth Movements</b>	
	Activity 1-3	Pages 13-37

refrigerators, bulbs, candles, lanterns) have been designed and made by people to solve human problems and enhance the quality of life (manmade objects)	Reader	Pages 2-5
	<b>Food Chains and Webs</b>	
	Activity 1	Pages 15-22
	<b>Sound</b>	
	Activity 12	Pages 99-105
	Reader	Pages 12-13
	<b>Magnets</b>	
	Activity 10-11	Pages 65-76
	Reader	Pages 8-12
	<b>Electric Circuits</b>	
Activity 10-11	Pages 77-88	
Reader	Pages 2-6	

**Concept B: Advances in technology often result in improved data collection and an increase in scientific information**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Investigating States of Matter/ Earth, Sun, and Moon/Plants</i>		
a. Describe how new technologies have helped scientists make better observations and measurements for investigations (e.g., telescopes, magnifiers, balances, microscopes, computers, stethoscopes, thermometers)	DSM modules provide the opportunity to teach this expectation. See for example: <b>State of Matter</b> Activity 6-7, 11 <b>Soil Science</b> Activity 1-4 <b>Weather Watching</b> Reader <b>Solar System</b> Reader	Pages 51-63, 89-96 Pages 15-37 Page 15 Page 15

**2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time**

**Concept A: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – All units</i>		
a. Research biographical information about various scientists and inventors from different gender and ethnic backgrounds, and describe how their work contributed to science and technology (Assess Locally)	<b>Classroom Plants</b> Reader <b>Weather Watching</b> Reader <b>Solar System</b> Reader <b>Weather Instruments</b> Reader <b>Food Chains and Webs</b> Reader <b>Electric Circuits</b> Reader	Page 14 Page 13 Page 14 Pages 10-11 Page 12 Pages 12-13

**3. Science and technology affect, and are affected by, society**

**Concept A: People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		

<p>a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of people working alone or in groups solving everyday problems or learning through discovery)</p>	<p>DSM modules provide the opportunity to identify questions/problems and to solve them. See for example:  <b>Sink or Float</b>  Activity 9-12  <b>Classroom Plants</b>  Activity 5  <b>States of Matter</b>  Activity 5  <b>Food Chains and Webs</b>  Activity 3  <b>Animal Behavior</b>  Activity 3-6  <b>Electric Circuits</b>  Activity 6-7</p>	<p>Pages 75-107  Pages 47-53  Pages 41-48  Pages 31-37  Pages 19-44  Pages 51-62</p>
<p>b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally)</p>	<p><b>Sink or Float</b>  Activity 9-12  <b>Classroom Plants</b>  Activity 5  <b>States of Matter</b>  Activity 5  <b>Food Chains and Webs</b>  Activity 3  <b>Animal Behavior</b>  Activity 3-6  <b>Electric Circuits</b>  Activity 6-7</p>	<p>Pages 75-107  Pages 47-53  Pages 41-48  Pages 31-37  Pages 19-44  Pages 51-62</p>

# GRADE FOUR

## STRAND 1

### Properties and Principles of Matter and Energy

#### 1. Changes in properties and states of matter provide evidence of the atomic theory of matter

**Concept A: Objects, and the materials they are made of, have properties that can be used to describe and classify them**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Mixtures and Solutions</i>		
a) Describe and compare the masses of objects to the nearest gram using balance	<b>Measuring</b> Activity 10	Pages 71-78
b) Describe and compare the volumes (the amount of space an object occupies) of objects using a graduated cylinder	<b>Measuring</b> Activity 7	Pages 51-56
c. Recognize no two objects can occupy the same space at the same time (e.g., water level rises when an object or substance, such as a rock, is placed in a quantity of water)	<b>Measuring</b> Activity 8, Science Challenge	Page 63
d. Classify types of materials (e.g., water, salt, sugar, iron filings, salt water) into substances (materials that have specific physical properties) or mixtures of substances by using their characteristic properties	<b>Powders and Crystals</b> Activity 2-10	Pages 13-78

**Concept B: Properties of mixtures depend upon the concentrations, properties, and interactions of particles**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Mixtures and Solutions/ Changes on the Earth's Surface</i>		
a. Identify water as a solvent that dissolves materials (Do NOT assess the term solvent)	<b>Powders and Crystals</b> Activity 5 Activity 5, Science Challenge	Pages 35-42 Page 42
b. Observe and describe how mixtures are made by combining solids or liquids, or a combination	<b>Powders and Crystals</b> Activity 5, 10,12	Pages 35-42, 71-78, 82-93

of these		
c. Distinguish between the components in a mixture (e.g., trail mix, conglomerate rock, salad)	<b>Powders and Crystals</b> Activity 10,12	Pages 71-78, 82-93
d. Describe ways to separate the components of a mixture by their properties (i.e., sorting, filtration, magnets, screening)	<b>Powders and Crystals</b> Activity 12, Science Challenge	Pages 93

**Concept I: Mass is conserved during any physical or chemical change**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Mixtures and Solutions</i>		
a. Recognize that the total mass of a material remains constant whether it is together, in parts, or in a different state		

**2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems**

**Concept A: Forms of energy have a source, a means of transfer (work and heat), and a receiver**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Forms of Energy: Electrical Circuits</i>		
a. Construct and diagram a complete electric circuit by using a source (e.g., battery), means of transfer (e.g., wires), and receiver (e.g., resistance bulbs, motors, fans)	<b>Electrical Circuits</b> Activity 1-2 Reader	Pages 13-25 Pages 4, 7
b. Observe and describe the evidence of energy transfer in a closed series circuit (e.g., lit bulb, moving motor, fan)	<b>Electrical Circuits</b> Activity 1-4 Reader	Pages 13-43 Pages 4-6
c. Classify materials as conductors or insulators of electricity when placed within a circuit (e.g., wood, pencil lead, plastic, glass, aluminum foil, lemon juice, air, water)	<b>Electrical Circuits</b> Activity 6-7 Reader	Pages 51-62 Page 3

**Concept F: Energy can change from one form to another within systems, but the total amount remains the same**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Forms of Energy: Electrical Circuits</i>		
a. Identify the evidence of energy transformations	<b>Electrical Circuits</b> Activity 1-4, 10-11	Pages 13-43, 77-88

(temperature change, light, sound, motion, and magnetic effects) that occur in electrical circuits	Reader <b>Magnets</b> Activity 11 Reader	Pages 4-6, 10  Pages 71-76 Page 10
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## STRAND 2

### Properties and Principles of Force and Motion

**1. The motion of an object is described by its change in position relative to another object or point**

**Concept A: The motion of an object is described as a change in position, direction, and speed relative to another object (frame of reference)**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Laws of Motion</i> a. Classify different types of motion (straight line, curved, back and forth)  b. Describe an object's motion in terms of distance and time		

**2. Forces affect motion**

**Concept A: Forces are classified as either contact forces (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude)**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Laws of Motion</i> a. Identify the forces acting on the motion of objects traveling in a straight line  b. Recognize friction as a force that slows down or stops a moving object that is touching another object or surface  c. Compare the forces (measured by a spring scale in Newtons) required to overcome friction when an object moves over different surfaces (i.e., rough/smooth)	 This expectation is addressed in the grade five module <u>Simple Machines</u> .  This expectation is addressed in the grade five module <u>Simple Machines</u> .  This expectation is addressed in the grade five module <u>Simple Machines</u> .	

**Concept B: Every object exerts a gravitational force on every other object**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Laws of Motion</i> a. Determine the gravitational pull of the Earth on an object (weight) using a spring scale	This expectation is addressed in the grade five module <u>Simple Machines</u> .	

**Concept D: Newton’s Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Laws of Motion</i></p> <p>a. Recognize that balanced forces do not affect an object’s motion</p> <p>b. Describe how unbalanced forces acting on an object changes its speed (faster/slower), direction of motion, or both</p> <p>c. Explain how increasing or decreasing the amount of force on an object affects the motion of that object</p> <p>d. Explain how the mass of an object (e.g., cars, marbles, rocks, boulders) affects the force required to move it</p> <p>e. Predict how the change in speed of an object (i.e., faster/slower/remains the same) is affected by the amount of force applied to an object and the mass of the object</p>	<p>This expectation is addressed in the grade five module <u>Simple Machines</u>.</p> <p>This expectation is addressed in the grade five module <u>Simple Machines</u>.</p>	
<p><i>Scope and Sequence – Forms of Energy: Electrical Circuits</i></p> <p>f. Predict the effects of an electrostatic force (static electricity) on the motion of objects (attract or repel)</p>	<p><b>Electrical Circuits</b> Activity 2, Science Extension</p>	Page 25

### STRAND 3

#### Characteristics and Interactions of Living Organisms

Not assessed at this level

### STRAND 4

#### Changes in Ecosystems and Interactions of Organisms with their Environments

##### 1. Organisms are interdependent with one another and with their environment

**Concept A: All populations living together within a community interact with one another and with their environment in order to survive and maintain a balanced ecosystem**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Interactions among Organisms and their Environment</i></p> <p>a. Identify the ways a specific</p>	<p><b>Food Chains and Webs</b></p>	

organism may interact with other organisms or with the environment (e.g., pollination, shelter, seed dispersal, camouflage, migration, hibernation, defensive mechanism)	Activity 4-5, 7, 9 Reader <b>Insect Life</b> Activity 8 <b>Animal Behavior</b> Activity 3-7 <b>Plant and Animal Life Cycles</b> Reader	Pages 39-52, 59-66, 73-79 Pages 4-5  Pages 55-60  Pages 19-52  Page 5
b. Recognize different environments (i.e., pond, forest, prairie) support the life of different types of plants and animals	<b>Food Chains and Webs</b> Activity 1-9 Reader <b>Insect Life</b> Activity 4 <b>Small Things and Microscopes</b> Activity 10-11 <b>Plant and Animal Life Cycles</b> Reader	Pages 15-79 Pages 14-15  Pages 29-34  Pages 61-71  Page 15

**Concept D: The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Interactions among Organisms and their Environment</i> a. Identify examples in Missouri where human activity has had a beneficial or harmful effect on other organisms (e.g., feeding birds, littering vs. picking up trash, hunting/conservation of species, paving/restoring greenspace)	Local Objective	

**2. Matter and energy flow through an ecosystem**

**Concept A: As energy flows through the ecosystem, all organisms capture a portion of that energy and transform it to a form they can use**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Interactions among Organisms and their Environment</i> a. Classify populations of organisms as producers, consumers, or decomposers by the role they serve in the ecosystem	<b>Food Chains and Webs</b> Activity 3, 7-10 Reader	Pages 31-37, 59-87 Page 6
b. Differentiate between the three types of consumers (herbivore, carnivore, omnivore)	<b>Food Chains and Webs</b> Activity 11, Science Extension Reader	Page 95 Page 6
c. Categorize organisms as predator or prey in a given ecosystem	<b>Food Chains and Webs</b> Activity 11-12 Reader	Pages 89-101 Page 4

**3. Genetic variation sorted by the natural selection process explains evidence of biological evolution**

**Concept A: Evidence for the nature and rates of evolution can be found in anatomical and molecular characteristics of organisms and in the DSMil record**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<p><i>Scope and Sequence – Changes in the Earth’s Surface</i></p> <p>a. Compare and contrast common fossils found in Missouri (i.e., trilobites, ferns, crinoids, gastropods, bivalves, fish, mastodons) to organisms present on Earth today</p>	Local Objective	

**Concept C: Natural selection is the process of sorting individuals based on their ability to survive and reproduce within their ecosystem**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<p><i>Scope and Sequence – Interactions among Organisms and their Environment</i></p> <p>a. Identify specialized structures and describe how they help plants survive in their environment (e.g., root, cactus needles, thorns, winged seed, waxy leaves)</p> <p>b. Identify specialized structures and senses and describe how they help animals survive in their environment (e.g., antennae, body covering, teeth, beaks, whiskers, appendages)</p> <p>c. Recognize internal cues (e.g., hunger) and external cues (e.g., changes in the environment) that cause organisms to behave in certain ways (e.g., hunting, migration, hibernation)</p> <p>d. Predict which plant or animal will be able to survive in a specific environment based on its special structures or behaviors</p>	<p><b>Food Chains and Webs</b> Reader <b>Plant and Animal Life Cycles</b> Activity 3, 8 Reader</p> <p><b>Food Chains and Webs</b> Activity 4-8 Reader <b>Insect Life</b> Activity 9, 12 <b>Plant and Animal Life Cycles</b> Activity 4-5 Reader</p> <p><b>Food Chains and Webs</b> Activity 7-11 Reader <b>Insect Life</b> Activity 8, 10</p> <p><b>Insect Life</b> Activity 11 <b>Food Chains and Webs</b> Activity 5, 7 Reader</p>	<p>Page 5</p> <p>Pages 33-41, 75-82 Page 3-6</p> <p>Pages 39-72 Pages 4-5</p> <p>Pages 61-66, 79-83</p> <p>Pages 43-56 Page 15</p> <p>Pages 59-95 Pages 4-6</p> <p>Pages 55-60, 67-71</p> <p>Pages 73-78</p> <p>Pages 47-52, 59-66 Pages 4-5</p>

## STRAND 5

### Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

- c) Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures

**Concept A: The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Changes in the Earth's Surface</i>		
a. Identify and describe the components of soil (e.g., plant roots and debris, bacteria, fungi, worms, types of rock) and its properties (e.g., odor, color, resistance to erosion, texture, fertility, relative grain size, absorption rate)	This expectation is address in the grade three module <u>Soil Science</u> .	
b. Compare the physical properties (i.e., size, shape, color, texture, layering, presence of fossils) of rocks (mixtures of different Earth materials, each with observable physical properties)	This expectation is address in the grade five module <u>Rocks and Minerals</u> .	

2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes

**Concept A: The Earth's materials and surface features are changed through a variety of external processes**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Changes in the Earth's Surface</i>		
a. Observe and describe the breakdown of plant and animal material into soil through decomposition processes (i.e., decay, rotting, composting, digestion)	This expectation is address in the grade three module <u>Soil Science</u> .	
b. Identify the major landforms on Earth (i.e., mountains, plains, oceans, river valleys, coastlines, canyons)	<b>Earth Movements</b> Reader This expectation is address in the grade five module <u>Erosion</u> .	Pages 4-5
c. Describe how weathering agents (e.g., water, chemicals, temperature, wind, plants) cause surface changes that	<b>Earth Movements</b> Reader This expectation is address in the grade five module <u>Erosion</u> .	Pages 12-13

create and/or change Earth's surface materials and/or landforms		
d. Describe how erosional processes (i.e., action of gravity, waves, wind, rivers, glaciers) cause surface changes that create and/or change Earth's surface materials and/or landforms	<b>Earth Movements</b> Reader This expectation is address in the grade five module <u>Erosion</u> .	Pages 12-13

### 3. Human activity is dependent upon and affects Earth's resources and systems

#### Concept A: Earth's materials are limited natural resources affected by human activity

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Changes in the Earth's Surface</i>		
a. Identify the ways humans affect the erosion and deposition of Earth's materials (e.g., clearing of land, planting vegetation, paving land, construction of new buildings)	This expectation is address in the grade five module <u>Erosion</u> .	
b. Propose ways to solve simple environmental problems (e.g., recycling, composting, ways to decrease soil erosion) that result from human activity	This expectation is address in the grade five modules <u>Erosion</u> and <u>Pollution</u> .	

## STRAND 6

### Composition and Structure of the Universe and the Motion of the Objects Within It

Not assessed at this level

## STRAND 7

### Scientific Inquiry

#### 1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking

#### Concept A: Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Formulate testable questions and explanations (hypotheses)	DSM modules emphasize an inquiry approach. Students ask questions and seek answers. See for example: <b>Sound</b> Activity 9-11	Pages 73-98

	<b>Magnets</b> Activity 2-4 <b>Animal Behavior</b> Activity 3-6 <b>Food Chains and Webs</b> Activity 3 <b>Small Things and Microscopes</b> Activity 13	Pages 19-34  Pages 19-44  Pages 31-37  Pages 79-84
b. Recognize the characteristics of a fair and unbiased test	<b>Animal Behavior</b> Activity 3-6 <b>Insect Life</b> Activity 8 <b>Food Chains and Webs</b> Activity 3 <b>Sound</b> Activity 11 <b>Small Things and Microscopes</b> Activity 13	Pages 19-44  Pages 55-60  Pages 31-37  Page 91-98  Pages 79-84
c. Conduct a fair test to answer a question	<b>Animal Behavior</b> Activity 3-6 <b>Insect Life</b> Activity 8 <b>Food Chains and Webs</b> Activity 3 <b>Sound</b> Activity 11 <b>Small Things and Microscopes</b> Activity 13	Pages 19-44  Pages 55-60  Pages 31-37  Page 91-98  Pages 79-84

**Concept B: Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Make qualitative observations using the five senses	DSM modules emphasize student observation. See for example: <b>Plant and Animal Life Cycles</b> Activity 1 <b>Earth Movements</b> Activity 3-4 <b>Sound</b> Activity 1-2 <b>Food Chains and Webs</b> Activity 7-10 <b>Plant and Animal Life Cycles</b> Activity 1-5	Pages 15-21  Pages 29-46  Pages 13-28  Pages 59-87  Pages 15-56
b. Make observations using simple tools and equipment (e.g., hand lenses, magnets, thermometers, metric rulers, balances, graduated cylinders)	<b>Water Cycle</b> Activity 7 <b>Dinosaurs and Fossils</b> Activity 6-7 <b>Weather Instruments</b> Activity 1-5 <b>Small Things and Microscopes</b>	Pages 61-67  Pages 47-60  Pages 13-50

c. Measure length to the nearest centimeter, mass using grams, temperature using degrees Celsius, volume using liters	Activity 1-10	Pages 7-66
	<b>Weather Instruments</b> Activity 1-2 <b>Solar System</b> Activity 5-7 <b>Dinosaurs and Fossils</b> Activity 6-7 <b>Measuring</b> Activity 5-7, 10, 12	Pages 13-29 Pages 43-64 Pages 47-60 Pages 37-56, 71-78, 87-95
d. Compare amounts/measurements	<b>Looking at Liquids</b> Activity 8, 11 <b>Dinosaurs and Fossils</b> Activity 6-7 <b>Solar System</b> Activity <b>Weather Instruments</b> Activity 6 <b>Measuring</b> Activity 7, 10, 12	Pages 57-62, 77-81 Pages 47-60 Pages 51-58 Pages 51-57 Pages 51-56, 71-78, 87-95
	<b>Looking at Liquids</b> Activity 8, 11 <b>Weather Instruments</b> Activity 6 <b>Solar System</b> Activity 6 <b>Dinosaurs and Fossils</b> Activity 6-7 <b>Measuring</b> Activity 7, 10, 12	Pages 57-62, 77-81 Pages 51-57 Pages 51-58 Pages 47-60 Pages 51-56, 71-78, 87-95
e. Judge whether measurements and computation of quantities are reasonable	<b>Looking at Liquids</b> Activity 8, 11 <b>Weather Instruments</b> Activity 6 <b>Solar System</b> Activity 6 <b>Dinosaurs and Fossils</b> Activity 6-7 <b>Measuring</b> Activity 7, 10, 12	Pages 57-62, 77-81 Pages 51-57 Pages 51-58 Pages 47-60 Pages 51-56, 71-78, 87-95

**Concept C: Evidence is used to formulate explanations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Use quantitative and qualitative data as support for reasonable explanations	DSM modules emphasize the use of evidence to formulate explanations. See for example: <b>Sound</b> Activity 9-11 <b>Magnets</b> Activity 10-11 <b>Electric Circuits</b> Activity 6-7 <b>Food Chains and Webs</b> Activity 3 <b>Animal Behavior</b> Activity 3-6	Pages 73-98 Pages 65-76 Pages 51-62 Pages 31-37 Pages 19-44
	b. Use data as support for observed patterns and relationships, and to make predictions to be tested	<b>Sound</b> Activity 9-11 <b>Electric Circuits</b> Activity 6-7 <b>Weather Instruments</b> Activity 6 <b>Looking at Liquids</b> Activity 11

	<b>Food Chains and Webs</b> Activity 3	Pages 31-37
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**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence - All Units</i>		
a. Evaluate the reasonableness of an explanation	DSM modules encourage evaluation of explanations. See for example: <b>Dinosaurs and Fossils</b> Activity 6-7 <b>Earth Movements</b> Activity 3 <b>Water Cycle</b> Activity 6 <b>Looking at Liquids</b> Activity 11 <b>Food Chains and Webs</b> Activity 3	Pages 47-60 Pages 29-37 Pages 53-60 Pages 77-81 Pages 31-37
b. Analyze whether evidence supports proposed explanations	<b>Dinosaurs and Fossils</b> Activity 8 <b>Animal Behavior</b> Activity 3-6 <b>Looking at Liquids</b> Activity 11 <b>Food Chains and Webs</b> Activity 3 <b>Earth Movements</b> Activity 12	Pages 61-66 Pages 19-44 Pages 77-81 Pages 31-37 Pages 105-110

**Concept E: The nature of science relies upon communication of results and justification of explanations**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence - All Units</i>		
a. Communicate simple procedures and results of investigations and explanations through: oral presentations drawings and maps data tables, graphs (bar, single line, pictograph) writings	DSM modules emphasize student communication. See for example: <b>Solar System</b> Activity 6, 8 <b>Plant and Animal Life Cycles</b> Activity 6-9 <b>Weather Instruments</b> Activity 6-7 <b>Dinosaurs and Fossils</b> Activity 6-7 <b>Water Cycle</b> Activity 4-6	Pages 51-58, 65-72 Pages 57-89 Pages 51-66 Pages 47-60 Pages 39-60

## **STRAND 8**

### **Impact of Science, Technology and Human Activity**

**1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs**

**Concept A: Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Forms of Energy: Electrical Circuits</i></p> <p>a. Design and construct an electrical device, using materials and/or existing objects, that can be used to perform a task (Assess Locally)</p>	<p><b>Electric Circuits</b> Activity 12 Activity 12, Science Challenge</p> <p><b>Magnets</b> Activity 11</p>	<p>Pages 89-94 Page 94</p> <p>Pages 71-76</p>

**Concept B: Advances in technology often result in improved data collection and an increase in scientific information**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Mixtures and Solutions/Forms of Energy: Electrical Circuits</i></p> <p>a. Describe how new technologies have helped scientists make better observations and measurements for investigations (e.g., telescopes, magnifiers, balances, microscopes, computers, stethoscopes, thermometers)</p>	<p><b>Earth Movements</b> Activity 8, Science, Technology and Society</p> <p><b>Solar System</b> Activity 2, Science, Technology and Society Reader</p> <p><b>Magnets</b> Activity 3, Science, Technology and Society</p> <p>Activity 4, Science, Technology and Society</p> <p><b>Sound</b> Activity 5, Science, Technology and Society</p>	<p>Pages 77</p> <p>Page 26 Page 15</p> <p>Page 28</p> <p>Page 34</p> <p>Page 50</p>

**Concept C: Technological solutions to problems often have drawbacks as well as benefits**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Forms of Energy: Electrical Circuits/Laws of Motion/Interactions among Organisms and Their Environments</i></p> <p>a. Identify how the effects of inventions or technological advances (e.g., different types of light bulbs, semiconductors/integrated circuits and electronics, satellite imagery, robotics, communication, transportation, generation of energy, renewable materials) may be helpful, harmful, or both (Assess Locally)</p>	<p><b>Electric Circuits</b> Activity 10, Science, Technology and Society</p> <p><b>Magnets</b> Activity 4, Science, Technology and Society</p> <p>Activity 10, Science and Health</p> <p><b>Solar System</b> Activity 2, Science, Technology and Society</p> <p><b>Sound</b> Activity 5, Science, Technology and Society</p>	<p>Page 82</p> <p>Page 34</p> <p>Page 70</p> <p>Page 26</p> <p>Page 50</p>

**2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time**

**Concept A: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – All units</i>		
a. Research biographical information about various scientists and inventors from different gender and ethnic backgrounds, and describe how their work contributed to science and technology (Assess Locally)	<p><b>Simple Machines</b> Activity 1, Science, and Social Studies</p> <p><b>Electric Circuits</b> Activity 9, Science, and Social Studies Reader</p> <p><b>Food Chains and Webs</b> Reader</p> <p><b>Weather Instruments</b> Reader</p> <p><b>Solar System</b> Reader</p> <p><b>Sound</b> Activity 7, Science, and Social Studies</p>	<p>Page 18</p> <p>Page 76 Pages 12-13</p> <p>Page 12</p> <p>Pages 10-11</p> <p>Page 14</p> <p>Page 65</p>

**3. Science and technology affect, and are affected by, society**

**Concept A: People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of people working alone or in groups solving everyday problems or learning through discovery)	<p>DSM modules provide the opportunity to identify questions/problems and to solve them. See for example:</p> <p><b>Food Chains and Webs</b> Activity 3</p> <p><b>Animal Behavior</b> Activity 3-6</p> <p><b>Electric Circuits</b> Activity 6-7</p> <p><b>Sound</b> Activity 12</p> <p><b>Powders and Crystals</b> Activity 10, 12</p>	<p>Pages 31-37</p> <p>Pages 19-44</p> <p>Pages 51-62</p> <p>Pages 99-105</p> <p>Pages 71-78, 82-93</p>
b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally)	<p><b>Food Chains and Webs</b> Activity 3</p> <p><b>Animal Behavior</b> Activity 3-6</p> <p><b>Electric Circuits</b> Activity 6-7</p> <p><b>Sound</b> Activity 12</p> <p><b>Powders and Crystals</b> Activity 10, 12</p>	<p>Pages 31-37</p> <p>Pages 19-44</p> <p>Pages 51-62</p> <p>Pages 99-105</p> <p>Pages 71-78, 82-93</p>

# GRADE FIVE

## STRAND 1

### Properties and Principles of Matter and Energy

#### 1. Changes in properties and states of matter provide evidence of the atomic theory of matter

**Concept C: Properties of matter can be explained in terms of moving particles too small to be seen without tremendous magnification**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Water Cycle and Weather</i> a. Recognize how changes in state (i.e., freezing/melting, condensation/evaporation) provide evidence that matter is made of particles too small to be seen	DSM activities provide the opportunity to teach this expectation. See for example: <b>Oceans</b> Activity 5 <b>Weather Forecasting</b> Activity 9 Reader	Pages 55-63  Pages 69-74 Page 4

**Concept D: Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Water cycle and Weather</i> a. Classify matter as a solid, a liquid, or a gas, as it exists at room temperature, using physical properties (i.e., volume, shape, ability to flow)	<b>Oceans</b> Activity 5 <b>Weather Forecasting</b> Activity 9	Pages 55-63  Pages 69-74
b. Predict the effect of heat energy on the physical properties of water as it changes to and from a solid, liquid, or gas (i.e., freezing/melting, evaporation/condensation)	<b>Oceans</b> Activity 5 <b>Weather Forecasting</b> Activity 9 Reader	Pages 55-63  Pages 69-74 Page 4

**Concept I: Mass is conserved during any physical or chemical change**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Water Cycle and Weather</i> a. Recognize the mass of water remains constant as it changes state (as evidenced in a closed container)		

#### 2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between within systems

**Concept A: Forms of energy have a source, a means of transfer (work and heat), and a receiver**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Solar System</i>		
a. Recognize light can be transferred from the source to the receiver (eye) through space in straight lines	<b>Lenses and Mirrors</b> Activity 1, 3-4, 10 <b>Color and Light</b> Activity 1-7 Reader	Pages 7-12, 21-34, 75-87  Pages 13-67 Pages 2-3, 10
b. Recognize how an object (e.g., moon, mirror, objects in a room) can only be seen when light is reflected from that object to the receiver (eye)	<b>Lenses and Mirrors</b> Activity 1-7 <b>Color and Light</b> Activity 2-7 Reader	Pages 7-54  Pages 19-67 Pages 4-5, 7

**Concept C: Electromagnetic energy from the Sun (solar radiation) is a major source of energy on Earth**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Water Cycle and Weather</i>		
a. Recognize the Sun as the primary source of energy for temperature change on Earth	<b>Solar Energy</b> Activity 2 <b>Weather Forecasting</b> Activity 9 Activity 1, Science Extension <b>Color and Light</b> Reader <b>Oceans</b> Activity 5	Pages 13-19  Pages 69-74 Pages 18  Page 2  Pages 55-63

## STRAND 2

### Properties and Principles of Force and Motion

#### 2. Forces affect motion

**Concept A: Forces are classified as either contact forces (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Work and Simple Machines</i>		
a. Identify the forces acting on a load and use a spring scale to measure the weight (resistance force) of the load	<b>Simple Machines</b> Activity 1, 8-9	Pages 13-18, 65-76

**Concept D: Newton's Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Work and Simple Machines</i>		
a. Describe how friction affects the amount of force needed to do work over different surfaces or through different media	<b>Simple Machines</b> Activity 3	Pages 25-31

**Concept F: Simple machines (levers, inclined planes, wheel and axle, pulleys) affect the force applied to an object and/or direction of movement as work is done**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Work and Simple Machines</i>		
a. Explain how work can be done on an object (force applied and distance moved) (No formula calculations at this level)	<b>Simple Machines</b> Activity 1 Reader	Pages 13-18 Page 3
b. Recognize simple machines change the amount of effort force and/or direction of force	<b>Simple Machines</b> Activity 2, 5,8-11 Reader	Pages 19-24, 39-47, 65-89 Pages 4-9
c. Compare the measures of effort force (measured using a spring scale to the nearest Newton) needed to lift a load with and without the use of simple machines	<b>Simple Machines</b> Activity 8-9	Pages 65-76
d. Identify the simple machines in common tools and household items	<b>Simple Machines</b> Activity 12 Reader	Pages 91-95 Pages 4-7, 9-11

### STRAND 3

#### Characteristics and Interactions of Living Organisms

**1. There is a fundamental unity underlying the diversity of all living organisms**

**Concept D: Plants and animals have different structures that serve similar functions necessary for the survival of the organism**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Classification of Plants and Animals</i>		
a. Compare structures (e.g., wings vs. fins vs. legs; gills vs. lungs; feathers vs. hair vs. scales) that serve similar functions for animals belonging to different vertebrate classes	<b>Pond Life</b> Activity 9	Pages 63-67

**Concept E: Biological classifications are based on how organisms are related**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Classification of Plants and Animals</i>		
a. Explain how similarities are the basis for classification	<b>Pond Life</b> Activity 9, Science Challenge <b>Fungi-Small Wonders</b> Activity 1-2 This expectation is further addressed in the grade four module <u>Insect Life</u> .	Page 67 Pages 7-18

<p>b. Distinguish between plants (which use sunlight to make their own food) and animals (which must consume energy-rich food)</p> <p>c. Classify animals as vertebrates or invertebrates</p> <p>d. Classify vertebrate animals into classes (amphibians, birds, reptiles, mammals, fish) based on their characteristics</p> <p>e. Identify plants or animals using simple dichotomous keys</p>	<p><b>Pond Life</b> Activity 8-11 This expectation is further addressed in the grade four module <u>Food Chains and Webs</u>.</p> <p>This expectation is addressed in the grade four module <u>Insect Life</u>.</p>	<p>Pages 57-80</p>
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**2. Living organisms carry out life processes in order to survive**

**Concept C: Complex multicellular organisms have systems that interact to carry out life processes through physical and chemical means**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Classification of Plants and Animals</i></p> <p>a. Recognize the major life processes carried out by the major systems of plants and animals (e.g., support, reproductive, digestive, transport/circulatory, excretory, response) Do NOT assess naming of organs within each system or explanation of the processes carried out by those systems</p>	<p><b>You and Your Body</b> Activity 1-2, 4, 6-7 Reader</p> <p><b>Fungi-Small Wonders</b> Activity 1-2</p> <p><b>Pond Life</b> Activity 8-10</p>	<p>Pages 13-25 Pages 4-11</p> <p>Pages 17-18</p> <p>Pages 57-74</p>

**STRAND 4**

**Changes in Ecosystems and Interactions of Organisms with their Environments**

Not assessed at this level

**STRAND 5**

**Processes and Interactions of the Earth’s Systems (Geosphere, Atmosphere, and Hydrosphere)**

**1. Earth’s systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures**

**Concept B: The hydrosphere is composed of water (a material with unique properties) and other materials**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Water Cycle and Weather</i>		
a. Classify major bodies of surface water (e.g., rivers, lakes, oceans, glaciers) as fresh or salt water, flowing or stationary, large or small, solid or liquid, surface or groundwater	<b>Oceans</b> Activity 1 Reader	Pages 13-21 Page 2
b. Relate the type of water body to the process by which it was formed	<b>Oceans</b> Reader	Page 2

**Concept C: The atmosphere (air) is composed of a mixture of gases, including water vapor, and minute particles**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Water Cycle and Weather</i>		
a. Recognize the atmosphere is composed of a mixture of gases, water, and minute particles	<b>Weather Forecasting</b> Activity 1, Science Challenge Reader	Page 18 Pages 2, 4

**2. Earth’s Systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes**

**Concept E: Changes in the form of water as it moves through Earth’s systems are described as the water cycle**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Water Cycle and Weather</i>		
a. Describe and trace the path of water as it cycles through the hydrosphere, geosphere, and atmosphere (i.e., the water cycle: evaporation, condensation, precipitation, surface run-off/ groundwater flow)	<b>Weather Forecasting</b> Activity 1, Science Extension Reader <b>Oceans</b> Activity 5	Page 18 Page 4  Pages 55-63
b. Identify the different forms water can take (e.g., snow, rain, sleet, fog, clouds, dew) as it moves through the water cycle	<b>Weather Forecasting</b> Activity 1, Science Extension Reader <b>Oceans</b> Activity 5	Page 18 Page 4  Pages 55-63

**Concept F: Constantly changing properties of the atmosphere occur in patterns which are described as weather**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Water Cycle and Weather</i>		
a. Identify and use appropriate tools (i.e., thermometer, anemometer, wind vane, hygrometer, barometer, rain gauge, satellite)	<b>Weather Forecasting</b> Activity 3, 5, 10 Reader	Pages 25-32, 41-48, 75-80 Pages 3-6, 14

<p>images, weather maps) to collect weather data (i.e., temperature, wind speed and direction, relative humidity, air pressure, precipitation, cloud type and cover)</p> <p>b. Recognize and summarize relationships between weather data (e.g., temperature and time of day, cloud cover and temperature, wind direction and temperature) collected over a period of time</p>	<p><b>Weather Forecasting</b> Activity 3, 5, 10</p>	<p>Pages 25-32, 41-48, 75-80</p>
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**3. Human activity is dependent upon and affects Earth’s resources and systems**

**Concept A: Earth’s materials are limited natural resources affected by human activity**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Water Cycle and Weather</i>		
a. Explain how major bodies of water are important natural resources for human activity (e.g., food, recreation, habitat, irrigation, solvent, transportation)	<p><b>Oceans</b> Activity 10-12 Activity 9, Science, Technology, and Society Reader</p>	<p>Pages 113-142</p> <p>Page 111 Pages 11-13</p>
b. Describe how human needs and activities (e.g., irrigation, damming of rivers, waste treatment, sources of drinking water) have affected the quantity and quality of major bodies of fresh water	<p><b>Oceans</b> Activity 5-6 <b>Pollution</b> Reader</p>	<p>Pages 39-52</p> <p>Pages 9-12</p>
c. Propose solutions to problems related to water quality and availability that result from human activity	<p><b>Pollution</b> Reader</p>	<p>Pages 10-12</p>

**STRAND 6**

**Composition and Structure of the Universe and the Motion of the Objects Within It**

**1. The universe has observable properties and structure**

**Concept A: The Earth, Sun, and moon are part of a larger system that includes other planets and smaller celestial bodies**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Solar System</i>		
a. Recognize the Earth is one of several planets	<p>This expectation is addressed in the grade four module <u>Solar</u></p>	

within a solar system that orbits the Sun	<u>System</u> and the grade six module <u>Astronomy</u> .	
b. Recognize the moon orbits the Earth	This expectation is addressed in the grade six module <u>Earth, Moon and Sun</u> .	
c. Recognize planets look like stars and appear to move across the sky among the stars	This expectation is addressed in the grade six module <u>Astronomy</u> .	

**Concept B: The Earth has a composition and location suitable to sustain life**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Solar System</i>		
a. Describe physical features of the planet Earth that allows life to exist (e.g., air, water, temperature) and compare these to the physical features of the Sun, the moon, and other planets	This expectation is addressed in the grade four module <u>Solar System</u> .	

**2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces**

**Concept B: The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Solar System</i>		
a. Sequence images of the lit portion of the moon seen from Earth as it cycles day-to-day in about a month in order of occurrence (Do NOT assess cause of moon phases)	This expectation is addressed in the grade six module <u>Earth, Moon and Sun</u> .	

**Concept C: The regular and predictable motions of the Earth and moon relative to the Sun explain natural phenomena on Earth, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Solar System</i>		
a. Recognize the Earth rotates once every 24 hours	This expectation is addressed in the grade four module <u>Solar System</u> and the grade six modules <u>Astronomy</u> and <u>Earth, Moon and Sun</u> .	
b. Relate changes in the length and position of a shadow to the time of day and apparent position of the Sun in the sky, as determined by Earth's		

rotation		
c. Relate the apparent motion of the Sun, moon, and stars in the sky to the rotation of the Earth (Do not assess apparent motion of polar constellations)	This expectation is addressed in the grade six module <u>Astronomy</u> .	

## STRAND 7 Scientific Inquiry

**1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking**

**Concept A: Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Formulate testable questions and explanations (hypotheses)	DSM modules emphasize an inquiry approach. Students ask questions and seek answers. See for example: <b>You and Your Body</b> Activity 3, 5 <b>Solar Energy</b> Activity 3-8 <b>Erosion</b> Activity 5, 8 <b>Pond Life</b> Activity 12 <b>Pollution</b> Activity 10 <b>Fungi- Small Wonders</b> Activity 7	Pages 27-31, 41-48  Pages 21-58  Pages 51-57, 67-73  Pages 81-86  Pages 71-76  Pages 45-49
b. Recognize the characteristics of a fair and unbiased test	<b>You and Your Body</b> Activity 5 <b>Solar Energy</b> Activity 3-8 <b>Erosion</b> Activity 5, 8 <b>Pond Life</b> Activity 12 <b>Pollution</b> Activity 10 <b>Fungi- Small Wonders</b> Activity 7	Pages 41-48  Pages 21-58  Pages 51-57, 67-73  Pages 81-86  Pages 71-76  Pages 45-49
c. Conduct a fair test to answer a question	<b>You and Your Body</b> Activity 5 <b>Solar Energy</b> Activity 3-8 <b>Erosion</b> Activity 5, 8 <b>Pond Life</b> Activity 12	Pages 41-48  Pages 21-58  Pages 51-57, 67-73  Pages 81-86

	<b>Pollution</b> Activity 10 <b>Fungi- Small Wonders</b> Activity 7	Pages 71-76  Pages 45-49
d. Make suggestions for reasonable improvements or extensions of a fair test	DSM provides the opportunity to teach this expectation. See examples above.	

**Concept B: Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Make qualitative observations using the five sense	DSM investigations emphasize student observation. See for example: <b>You and Your Body</b> Activity 1-2, 7 <b>Rocks and Minerals</b> Activity 1, 3-6 <b>Fungi-Small Wonders</b> Activity 1-4 <b>Flight and Rocketry</b> Activity 1-2, 6 <b>Color and Light</b> Activity 1-7	Pages 13-25, 55-60  Pages 13-19, 29-54  Pages 7-29  Pages 13-32, 65-72  Pages 13-67
b. Determine the appropriate tools and techniques to collect data	<b>You and Your Body</b> Activity 5 <b>Simple Machines</b> Activity 8-9 <b>Flight and Rocketry</b> Activity 9 <b>Rocks and Minerals</b> Activity 4-6 <b>Weather Forecasting</b> Activity 3, 5	Pages 41-48  Pages 65-76  Pages 91-97  Pages 35-54  Pages 25-32, 41-48
c. Use a variety of tools and equipment to gather data (e.g., hand lenses, magnets, thermometers, metric rulers, balances, graduated cylinders, spring scales)	<b>Pond Life</b> Activity 6-7 <b>Simple Machines</b> Activity 8-9 <b>Solar Energy</b> Activity 2-8 <b>Weather Forecasting</b> Activity 3, 5 <b>Pollution</b> Activity 8, 10	Pages 41-55  Pages 65-76  Pages 13-58  Pages 25-32, 41-48  Pages 59-64, 71-76
d. Measure length to the nearest centimeter, mass to the nearest gram, volume to the nearest milliliter, temperature to the nearest degree Celsius, weight to the nearest Newton	<b>Simple Machines</b> Activity 1 <b>Flight and Rocketry</b> Activity 9 <b>Weather Forecasting</b> Activity 3 <b>You and Your Body</b> Activity 5 <b>Solar Energy</b> Activity 2-8 <b>Pollution</b>	Pages 13-18  Pages 91-97  Pages 25-32  Pages 41-48  Pages 13-58

e. Compare amounts/measurements	Activity 10 <b>Simple Machines</b> Activity 8-9 <b>Flight and Rocketry</b> Activity 9 <b>You and Your Body</b> Activity 3, 5 <b>Solar Energy</b> Activity 3-8 <b>Pollution</b> Activity 10	Pages 71-76  Pages 65-70  Pages 91-97  Pages 27-31, 41-48  Pages 21-58  Pages 71-76
f. Judge whether measurements and computation of quantities are reasonable	<b>Simple Machines</b> Activity 9 <b>Flight and Rocketry</b> Activity 9 <b>You and Your Body</b> Activity 5 <b>Solar Energy</b> Activity 3-8 <b>Pollution</b> Activity 10	Pages 71-76  Pages 91-97  Pages 41-48  Pages 21-58  Pages 71-76

**Concept C: Evidence is used to formulate explanations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Use quantitative and qualitative data as support for reasonable explanations	DSM modules emphasize the use of evidence to formulate explanations. See for example: <b>Color and Light</b> Activity 4-7 <b>Electromagnetism</b> Activity 6 <b>Pollution</b> Activity 9-10 <b>Simple Machines</b> Activity 6-9 <b>Erosion</b> Activity 9-12	Pages 37-67  Pages 43-48  Pages 65-76  Pages 49-76  Pages 75-104
b. Use data as support for observed patterns and relationships, and to make predictions to be tested	<b>You and Your Body</b> Activity 5 <b>Pollution</b> Activity 10 <b>Flight and Rocketry</b> Activity 9 <b>Electromagnetism</b> Activity 6 <b>Solar Energy</b> Activity 3-8	Pages 41-48  Pages 71-76  Pages 91-97  Pages 43-48  Pages 21-58

**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Evaluate the reasonableness of an	DSM modules provide the opportunity to evaluate	

explanation	explanations. See for example: <b>Fungi-Small Wonders</b> Activity 7 <b>Pollution</b> Activity 10 <b>Erosion</b> Activity 9-12 <b>Electromagnetism</b> Activity 6 <b>Weather Forecasting</b> Activity 5	Pages 45-49 Pages 71-76 Pages 75-104 Pages 43-48 Pages 41-48
b. Analyze whether evidence and scientific principles support proposed explanations	<b>Electromagnetism</b> Activity 6 <b>You and Your Body</b> Activity 5 <b>Pollution</b> Activity 10 <b>Fungi-Small Wonders</b> Activity 7 <b>Flight and Rocketry</b> Activity 9	Pages 43-48 Pages 41-48 Pages 71-76 Pages 45-49 Pages 91-97

**Concept E: The nature of science relies upon communication of results and justification of explanations**

DSM	Grade Level Expectation	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Communicate simple procedures and results of investigations and explanations through: oral presentations drawings and maps data tables graphs (bar, single line, pictograph) writings	<b>You and Your Body</b> Activity 3, 5 <b>Electromagnetism</b> Activity 6 <b>Solar Energy</b> Activity 3-8 <b>Erosion</b> Activity 9-12 <b>Color and Light</b> Activity 3-7 <b>Simple Machines</b> Activity 6-9	Pages 27-31, 41-48 Pages 43-48 Pages 21-58 Pages 75-104 Pages 29-67 Pages 49-76

## STRAND 8

### Impact of Science, Technology and Human Activity

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs

**Concept A: Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Work and Simple Machines</i>		
a. Design and construct a machine, using materials and/or existing objects, that can be used to perform a task (Assess Locally)	<b>Simple Machines</b> Activity 5-6 Activity 12, Science Challenge	Pages 39-55 Page 95

**Concept B: Advances in technology often result in improved data collection and an increase in scientific information**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<p><i>Scope and Sequence – Work and Simple Machines/Water Cycle and Weather/Solar System/Classification of Plants and Animals</i></p> <p>a. Describe how new technologies have helped scientists make better observations and measurements for investigations (e.g., telescopes, electronic balances, electronic microscopes, x-ray technology, computers, ultrasounds, computer probes such as thermometers)</p>	<p><b>Oceans</b> Activity 4 Reader</p> <p><b>Weather Forecasting</b> Activity 1, Science, Technology, and Society</p> <p><b>You and Your Body</b> Activity 4, Science and Health</p>	<p>Pages 43-54 Page 15</p> <p>Page 18</p> <p>Page 39</p>

**Concept C: Technological solutions to problems often have drawbacks as well as benefits**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<p><i>Scope and Sequence – Simple Machines/Water Cycle and Weather/Solar System/Classification of Plants and Animals</i></p> <p>a. Identify how the effects of inventions or technological advances (e.g., complex machinery, technologies used in space exploration, satellite imagery, weather observation and prediction, communication, transportation, robotics, tracking devices) may be helpful, harmful, or both (Assess Locally)</p>	<p><b>Weather Forecasting</b> Activity 5 Activity 12, Science, Technology, and Society</p> <p><b>Oceans</b> Activity 9, Science, Technology, and Society</p> <p><b>You and Your Body</b> Activity 7, Science, Technology, and Society Activity 14, Science, Technology, and Society</p> <p><b>Electromagnetism</b> Activity 11, Science, Technology, and Society</p>	<p>Pages 41-48</p> <p>Page 93</p> <p>Page 111</p> <p>Page 60</p> <p>Page 102</p> <p>Page 83</p>

**2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time**

**Concept A: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<p><i>Scope and Sequence – All units</i></p> <p>a. Research biographical information about various scientists and inventors from different gender and ethnic backgrounds, and describe how their work</p>	<p><b>Weather Forecasting</b> Activity 5, Science and Social Studies</p> <p><b>Flight and Rocketry</b> Activity 6, Science and Language Arts</p>	<p>Page 48</p> <p>Page 72</p>

contributed to science and technology (Assess Locally)	Reader <b>You and Your Body</b>	Page 14
	Reader <b>Simple Machines</b>	Pages 12-13
	Reader <b>Color and Light</b>	Page 12-13
	Reader	Page 14

### 3. Science and technology affect, and are affected by, society

**Concept A: People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of people working alone or in groups solving everyday problems or learning through discovery)	<b>Pond Life</b> Activity 12	Pages 81-86
	<b>Erosion</b> Activity 5-12	Pages 43-104
b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally)	<b>Solar Energy</b> Activity 3-8, 11-12	Pages 21-58, 71-82
	<b>Pollution</b> Activity 10	Pages 71-76
	<b>Flight and Rocketry</b> Activity 5, 9	Pages 55-64, 91-97
	<b>Pond Life</b> Activity 12	Pages 81-86
	<b>Erosion</b> Activity 5-12	Pages 43-104
	<b>Solar Energy</b> Activity 3-8, 11-12	Pages 21-58, 71-82
	<b>Pollution</b> Activity 10	Pages 71-76
	<b>Flight and Rocketry</b> Activity 5, 9	Pages 55-64, 91-97

# GRADE SIX

## STRAND 1

### Properties and Principles of Matter and Energy

#### 1. Changes in properties and states of matter provide evidence of the atomic theory of matter

**Concept A: Objects, and the materials they are made of, have properties that can be used to describe and classify them**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Properties of and Changes in Matter</i>		
a. Recognize matter is anything that has mass and volume	<b>Matter and Change</b> Activity 1 Reader	Pages 7-13 Page 2
b. Describe and compare the volumes (the amount of space an object occupies) of objects or substances directly, using a graduated cylinder, and/or indirectly, using displacement methods	<b>Matter and Change</b> Activity 1, 13 <b>Famous Scientists</b> Activity 1	Pages 7-13, 93-97 Pages 11-19
c. Describe and compare the masses (amounts of matter) of objects to the nearest gram using a balance	<b>Matter and Change</b> Activity 1	Pages 7-13
d. Classify the types of matter in an object into pure substances or mixtures using their specific physical properties	<b>Matter and Change</b> Activity 3 Reader	Pages 23-28 Pages 13-15

**Concept B: Properties of mixtures depend upon the concentrations, properties, and interactions of particles**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Properties of and Changes in Matter</i>		
a. Describe the properties of each component in a mixture/solution and their distinguishing properties (e.g., salt water, oil and vinegar, pond water, Kool-Aid)	<b>Matter and Change</b> Activity 3 Reader	Pages 23-28 Pages 13-15
b. Describe appropriate ways to separate the components of different types of mixtures (sorting, evaporation, filtration,	<b>Oceans</b> Activity 2 <b>Matter and Change</b> Activity 3 Reader	Pages 23-30 Pages 23-28 Pages 13-15

magnets, boiling, chromatography, screening)		
c. Predict how various solids (soluble/insoluble) behave (e.g., dissolve, settle, float) when mixed with water	<b>Matter and Change</b> Activity 3 Activity 3, Science Extension	Pages 23-28 Page 28

**Concept C: Properties of matter can be explained in terms of moving particles too small to be seen without tremendous magnification**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Properties of and Changes in Matter</i>		
a. Recognize evidence (e.g., diffusion of food coloring in water, light reflecting off of dust particles in the air, condensation of water vapor by increased pressure or decreased temperature) that supports the theory that matter is composed of small particles (atoms, molecules) that are in constant, random motion	DMS activities provide the opportunity to teach this expectation. See for example: <b>Weather Forecasting</b> Activity 9 <b>Oceans</b> Activity 2, 5 <b>Color and Light</b> Activity 3 <b>Matter and Change</b> Activity 2 Activity 3, Science Extension Reader	Pages 69-74 Pages 23-30, 55-63 Pages 29-35 Pages 15-21 Page 28 Pages 10-12

**Concept D: Properties of matter can be explained in terms of moving particles too small to be seen without tremendous magnification**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Earth's Resources</i>		
a. Describe the relationship between the change in the volume of water and changes in temperature as it relates to the properties of water (i.e., water expands and becomes less dense when frozen)	<b>Weather Forecasting</b> Activity 9 Reader <b>Oceans</b> Activity 5 Reader	Pages 69-74 Page 4 Pages 55-63 Page 12

**Concept G: Properties of objects and states of matter can change chemically and/or physically**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Properties of and Changes in Matter</i>		
a. Recognize and classify changes in matter as chemical and/or physical	<b>Matter and Change</b> Activity 2-3, 11-13 Reader	Pages 15-28, 81-97 Pages 13-20
b. Identify chemical changes (i.e., rusting, oxidation, burning, decomposition by acids, decaying, baking) in common objects (i.e., rocks such as limestone,	<b>Matter and Change</b> Activity 11-13 Reader	Pages 81-97 Page 16-20

minerals, wood, steel wool, plants) as a result of interactions with sources of energy or other matter that form new substances with different characteristic properties		
c. Identify physical changes in common objects (e.g., rocks, minerals, wood, water, steel wool, plants) and describe the processes which caused the change (e.g., weathering, erosion, cutting, dissolving)	<b>Erosion</b> Activity 1-2 <b>Oceans</b> Activity 3 <b>Weather Forecasting</b> Activity 9 <b>Pollution</b> Activity 5-6 <b>Rocks and Minerals</b> Activity 9 <b>Matter and Change</b> Activity 2-3	Pages 13-27  Pages 31-41  Pages 69-74  Pages 39-52  Pages 69-76  Pages 15-28

**Concept I: Mass is conserved during any physical or chemical change**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Properties of and Changes in Matter</i> a. Demonstrate and provide evidence that mass is conserved during a physical change		

**2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems**

**Concept A: Forms of energy have a source, a means of transfer (work and heat), and a receiver**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Forms of Energy: Light</i> a. Identify sources of visible light (e.g., the Sun and other stars, flint, bulb, flames, lightning)	<b>Color and Light</b> Activity 1 Reader <b>Solar Energy</b> Activity 2 <b>Famous Scientists</b> Activity 5 <b>Electrical Connections</b> Activity 2 <b>Earth, Moon and Sun</b> Activity 1 Reader	Pages 13-18 Pages 2-3  Pages 13-19  Pages 45-54  Pages 13-18  Pages 7-13 Pages 6-7
b. Describe evidence (i.e., cannot bend around walls) that visible light travels in a straight line, using the appropriate tools (i.e., pinhole viewer, ray box, laser pointer)	<b>Lenses and Mirrors</b> Activity 1-7 <b>Color and Light</b> Reader	Pages 7-54  Page 3
c. Compare the reflection of	<b>Lenses and Mirrors</b>	

<p>visible light by various surfaces (i.e., mirror, smooth and rough surfaces, shiny and dull surfaces, moon)</p>	<p>Activity 4-7 <b>Color and Light</b> Reader</p>	<p>Pages 27-54 Pages 4-5</p>
<p>d. Compare the refraction of visible light passing through different transparent and translucent materials (e.g., prisms, water, a lens)</p>	<p><b>Lenses and Mirrors</b> Activity 8-9 <b>Color and Light</b> Activity 1 Reader</p>	<p>Pages 55-74 Pages 13-18 Pages 5-7</p>
<p>e. Predict how different surfaces (transparent, translucent, opaque) and lenses (convex, concave) affect the behavior of visible light rays and the resulting image of an object</p>	<p><b>Color and Light</b> Reader</p>	<p>Pages 5-7</p>
<p>f. Identify receivers of visible light energy (e.g., eye, photocell)</p>	<p><b>Lenses and Mirrors</b> Activity 10 <b>Solar Energy</b> Activity 10 <b>Color and Light</b> Reader</p>	<p>Pages 75-87 Pages 65-70 Page 10</p>
<p>g. Recognize that an object is “seen” only when the object emits or reflects light to the eye</p>	<p><b>Lenses and Mirrors</b> Activity 10 <b>Color and Light</b> Activity 10-12 Reader</p>	<p>Pages 75-87 Pages 85-101 Page 10</p>
<p>h. Recognize differences in wavelength and energy levels within that range of visible light that can be seen by the human eye are perceived as differences in color</p>	<p><b>Color and Light</b> Reader</p>	<p>Pages 10-12</p>
<p><i>Scope and Sequence – Forms of Energy: Sound</i></p>		
<p>i. Describe how sound energy is transferred by wave-like disturbances that spread away from the source through a medium</p>	<p><b>Famous Scientists</b> Activity 6</p>	<p>Pages 55-64</p>
<p>j. Predict how the properties of the medium (e.g., air, water, empty space, rock) affect the speed of different types of mechanical waves (i.e., earthquake, sound)</p>		

**Concept C: Electromagnetic energy from the Sun (solar radiation) is a major source of energy on Earth**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>scope and Sequence — Forms of Energy: Light</i>	<b>Color and Light</b> Reader	Pages 8-9
a. Recognize energy from the Sun is transferred to Earth in a range of wavelengths and energy levels, including visible light, infrared radiation, and ultraviolet radiation		
<i>Scope and Sequence – Characteristics of Living Organisms</i>	<b>Pond Life</b> Activity 11 Activity 11, Science Challenge	Page 75-80 Page 80
b. Recognize the Sun is the source of almost all energy used to produce the food for living organisms		<b>Plants in Our World</b> Activity 8-9

**STRAND 2**

**Properties and Principles of Force and Motion**

Not assessed at this level

**STRAND 3**

**Characteristics and Interactions of Living Organisms**

**1. There is a fundamental unity underlying the diversity of all living organisms**

**Concept A: Organisms have basic needs for survival**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Characteristics of Living Organisms</i>	<b>You and Your Body</b> Reader <b>Fungi-Small Wonders</b> Activity 1-2, 4 <b>Plants in Our World</b> Activity 2, 4-10	Pages 6-11 Pages 7-18, 25-29 Pages 13-18, 25-68
a. Describe the common life processes necessary to the survival of organisms (i.e., growth, reproduction, life span, response to stimuli, energy use, exchange of gases, use of water, elimination of waste)		

**Concept C: Cells are the fundamental units of structure and function of all living things**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Characteristics of Living Organisms</i>	<b>You and Your Body</b> Reader <b>Fungi-Small Wonders</b> Activity 4 <b>Plants in Our World</b> Activity 1 <b>DNA-From Genes to Proteins</b>	Page 2 Pages 25-29 Pages 7-12
a. Recognize all organisms are composed of cells, the fundamental units of life, which carry on all life processes		

	Activity 3-4	Pages 19-29
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**Concept E: Biological classifications are based on how organisms are related**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Characteristics of Living Organisms</i>		
a. Most unicellular and others multicellular	DSM Activities provide the opportunity to teach this expectation. See for example: <b>Fungi-Small Wonders</b> Activity 4 <b>Pond Life</b> Activity 6-10 <b>DNA-From Genes to Proteins</b> Activity 11 <b>You and Your Body</b> Reader <b>Oceans</b> Activity 10-12	Pages 25-29 Pages 41-74 Pages 75-79 Pages 2-11 Pages 113-142
b. Examples of unicellular and multicellular	<b>Fungi-Small Wonders</b> Activity 4 <b>Pond Life</b> Activity 6-7 <b>DNA-From Genes to Proteins</b> Activity 11 <b>You and Your Body</b> Reader <b>Oceans</b> Activity 10-12	Pages 25-29 Pages 41-45 Pages 75-79 Pages 2-11 Pages 113-142

**2. Living organisms carry out life processes in order to survive**

**Concept A: The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Characteristics of Living Organisms</i>		
a. Compare and contrast the following plant and animal cell structures: cell membrane, nucleus, cell wall, chloroplast, and cytoplasm	<b>Plants in Our World</b> Activity 1 <b>DNA-From Genes to Proteins</b> Activity 3-4	Pages 7-12 Pages 19-29
b. Recognize the chloroplast as the cell structure where food is produced in plants and some unicellular organisms (e.g., algae, some protists)	<b>Plants in Our World</b> Activity 1	Pages 7-12

**Concept B: Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence –</i>		



**Concept D: The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Ecosystems and Populations</i>		
a. Describe beneficial and harmful activities of organisms, including humans (e.g., deforestation, overpopulation, water and air pollution, global warming, restoration of natural environments, river bank/coastal stabilization, recycling, channelization, reintroduction of species, depletion of resources), and explain how these activities affect organisms within an ecosystem	<b>Pond Life</b> Activity 11, Science, Technology and Society Activity 12, Science, Technology and Society <b>Pollution</b> Activity 6, 10 Reader	Pages 80 Page 86 Pages 47-52, 71-76 Pages 2-12
b. Predict the impact (beneficial or harmful) of a natural environmental change (e.g., forest fire, flood, volcanic eruption, avalanche) on the organisms in an ecosystem	DSM activities provide the opportunity to teach this expectation. See for example: <b>Pond Life</b> Activity 5-11	Pages 35-80
c. Describe possible solutions to potentially harmful environmental changes within an ecosystem	<b>Pond Life</b> Activity 11, Science, Technology and Society <b>Pollution</b> Reader	Page 80 Pages 9-12

**2. Matter and energy flow through an ecosystem**

**Concept A: As energy flows through the ecosystem, all organisms capture a portion of that energy and transform it to a form they can use**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Ecosystems and Populations</i>		
a. Diagram and describe the transfer of energy in an aquatic food web and a land food web with reference to producers, consumers, decomposers, scavengers, and predator/prey relationships	<b>Pond Life</b> Activity 11	Pages 75-80
b. Classify populations of unicellular and multicellular organisms as producers, consumers, and decomposers	<b>Pond Life</b> Activity 11	Pages 75-80

**3. Genetic variation sorted by the natural selection process explains evidence of biological evolution**

**Concept A: Evidence for the nature and rates of evolution can be found in anatomical and molecular characteristics of organisms and in the fossil record**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Ecosystems and Populations</i> a. Identify fossils as evidence some types of organisms (e.g., dinosaurs, trilobites, mammoths, giant tree ferns) that once lived in the past, and have since become extinct, have similarities with and differences from organisms living today		

**Concept C: Natural selection is the process of sorting individuals based on their ability to survive and reproduce within their ecosystem**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Ecosystems and Populations</i> a. Relate examples of adaptations (specialized structures or behaviors) within a species to its ability to survive in a specific environment (e.g., hollow bones/flight, hollow hair/insulation, dense root structure/compact soil, seeds/food, protection for plant embryo vs. spores, fins/movement in water)	<b>Pond Life</b> Activity 8-9 <b>Fungi-Small Wonders</b> Activity 1-2 <b>Plants in Our World</b> Activity 2, 4, 9 <b>Oceans</b> Activity 10-11 <b>Famous Scientists</b> Activity 9	Pages 57-67 Pages 7-18 Pages 13-18, 25-30, 57-61 Pages 113-134 Pages 85-92
b. Predict how certain adaptations, such as behavior, body structure, or coloration, may offer a survival advantage to an organism in a particular environment	<b>Pond Life</b> Activity 8-9 <b>Fungi-Small Wonders</b> Activity 4 <b>Oceans</b> Activity 10-11 <b>Famous Scientists</b> Activity 9	Pages 57-67 Pages 25-29 Pages 113-134 Pages 85-92

## **STRAND 5**

### **Processes and Interactions of the Earth’s Systems (Geosphere, Atmosphere, and Hydrosphere)**

**1. Earth’s systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures**

**Concept A: The Earth’s crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Earth’s Resources</i> a. Describe the components	<b>Earth Processes</b>	

of soil and other factors that influence soil texture, fertility, and resistance to erosion (e.g., plant roots and debris, bacteria, fungi, worms, rodents)	Activity 3 Reader	Pages 21-29 Pages 19-20
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**Concept B: The hydrosphere is composed of water (a material with unique properties), gases, and other materials**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Earth's Resources</i> a. Recognize the properties of water that make it an essential component of the Earth system (e.g., its ability to act as a solvent, its ability to remain as a liquid at most Earth temperatures)	<b>Oceans</b> Activity 2-3 Reader	Pages 23-41 Page 3

**2. Earth's Systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes**

**Concept A: The Earth's materials and surface features are changed through a variety of external processes**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Internal Processes and External Events</i> a. Make inferences about the formation of sedimentary rocks from their physical properties (e.g., layering and the presence of fossils indicate sedimentation)	<b>Rocks and Minerals</b> Activity 9-10 Reader <b>Earth Processes</b> Activity 4 Reader	Pages 69-84 Pages 10-11  Pages 31-38 Pages 16-18
b. Explain how the formation of sedimentary rocks depends on weathering and erosion	<b>Rocks and Minerals</b> Activity 9-10 Reader <b>Earth Processes</b> Activity 3-4 Reader	Pages 69-84 Pages 10-11, 13  Pages 21-38 Pages 17-18
c. Describe how weathering agents and erosional processes (i.e., force of water as it freezes or flows, expansion/contraction due to temperature, force of wind, force of plant roots, action of gravity, chemical decomposition) slowly cause surface changes that create and/or change landforms	<b>Erosion</b> Activity 1-2, 10-12 Reader <b>Earth Processes</b> Activity 3 Reader	Pages 13-27, 83-104 Pages 5-13  Pages 21-29 Pages 11-15
d. Describe how the Earth's surface and surface	<b>Erosion</b> Activity 5-6	Pages 43-57



<p>human activities (e.g., landfills, use of fertilizers and herbicides, farming, septic systems) on the quality of water</p> <p><i>Scope and Sequence – Internal Processes and External Events</i></p> <p>c. Analyze the ways humans affect the erosion and deposition of soil and rock materials (e.g., clearing of land, planting vegetation, paving land, construction of new buildings, building or removal of dams)</p>	<p>Activity 5-6 Activity 5, Science and Social Studies Reader</p> <p><b>Erosion</b> Reader <b>Earth Processes</b> Reader</p>	<p>Pages 39-52 Page 45 Pages 9-12</p> <p>Pages 14-15 Page 20</p>
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## STRAND 6

### Composition and Structure of the Universe and the Motion of the Objects Within It

Not assessed at this level

## STRAND 7

### Scientific Inquiry

**1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking**

**Concept A: Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Formulate testable questions and hypotheses	<p>DSM modules emphasize an inquiry approach. Students ask questions and seek answers using appropriate methods. See for example:</p> <p><b>You and Your Body</b> Activity 3, 5 <b>Erosion</b> Activity 5, 8 <b>Pollution</b> Activity 10 <b>Fungi-Small World</b> Activity 7 <b>Famous Scientists</b> Activity 7 <b>Matter and Change</b> Activity 12</p>	<p>Pages 27-31, 41-48 Pages 51-57, 67-73 Pages 71-76 Pages 45-49 Pages 65-75 Pages 87-92</p>
b. Recognize the importance of the independent variable, dependent variables, control of constants, and multiple	<p><b>Solar Energy</b> Activity 3-8 <b>Pond Life</b> Activity 12 <b>Plants in Our World</b></p>	<p>Pages 21-58 Pages 81-86</p>

<p>trials to the design of a valid experiment</p> <p>c. Design and conduct a valid experiment</p> <p>d. Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment</p> <p>e. Recognize different kinds of questions suggest different kinds of scientific investigations (e.g., some involve observing and describing objects, organisms, or events; some involve collecting specimens; some involve experiments; some involve making observations in nature; some involve discovery of new objects and phenomena; some involve making models)</p>	<p>Activity 3 <b>Matter and Change</b> Activity 12</p> <p><b>Solar Energy</b> Activity 3-8 <b>Pond Life</b> Activity 12 <b>Plants in Our World</b> Activity 3 <b>Matter and Change</b> Activity 12</p> <p>DSM activities provide the opportunity to teach this expectation. See examples above.</p> <p>DSM investigations provide the opportunity to teach this expectation. See for example: <b>Oceans</b> Activity 1-12 <b>Simple Machines</b> Activity 6-9 <b>Pollution</b> Activity 1-12 <b>Color and Light</b> Activity 2-8 <b>Electrical Connections</b> Activity 1-7 <b>Earth, Moon and Sun</b> Activity 1-7</p>	<p>Pages 19-24</p> <p>Pages 87-92</p> <p>Pages 21-58</p> <p>Pages 81-86</p> <p>Pages 19-24</p> <p>Pages 87-92</p> <p>Pages 13-142</p> <p>Pages 49-76</p> <p>Pages 13-88</p> <p>Pages 19-76</p> <p>Pages 7-51</p> <p>Pages 7-60</p>
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**Concept B: Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence - All Units</i>		
<p>a. Make qualitative observations using the five senses</p> <p>b. Determine the appropriate tools and techniques to collect data</p>	<p>DSM modules emphasize student observations and data collection. See for example: <b>You and Your Body</b> Activity 1-2, 7 <b>Rocks and Minerals</b> Activity 1, 3-6 <b>Color and Light</b> Activity 1-7 <b>Earth Processes</b> Activity 2-5 <b>Newton's Toy Box</b> Activity 10-13</p> <p><b>Simple Machines</b> Activity 8-9 <b>Flight and Rocketry</b> Activity 9 <b>Rocks and Minerals</b> Activity 4-6</p>	<p>Pages 13-25, 55-60</p> <p>Pages 13-19, 29-54</p> <p>Pages 13-67</p> <p>Pages 15-46</p> <p>Pages 55-70</p> <p>Pages 65-76</p> <p>Pages 91-97</p> <p>Pages 35-54</p>

<p>c. Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, computers, spring scales, balances, magnets, metric rulers, graduated cylinders, stopwatches)</p> <p>d. Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, temperature to the nearest degree Celsius, force (weight) to the nearest Newton, time to the nearest second</p> <p>e. Compare amounts/measurements</p> <p>f. Judge whether measurements and computation of quantities are reasonable</p>	<p><b>Weather Forecasting</b> Activity 3, 5</p> <p><b>Earth, Moon and Sun</b> Activity 3-4</p> <p><b>Newton's Toy Box</b> Activity 7-9</p> <p><b>Solar Energy</b> Activity 2-8</p> <p><b>Weather Forecasting</b> Activity 3, 5</p> <p><b>Pollution</b> Activity 8, 10</p> <p><b>Simple Machines</b> Activity 8-9</p> <p><b>Newton's Toy Box</b> Activity 7-9</p> <p><b>Matter and Change</b> Activity 1-2</p> <p><b>Flight and Rocketry</b> Activity 9</p> <p><b>You and Your Body</b> Activity 5</p> <p><b>Solar Energy</b> Activity 2-8</p> <p><b>Newton's Toy Box</b> Activity 7-8</p> <p><b>Matter and Change</b> Activity 1-2</p> <p><b>Famous Scientists</b> Activity 7</p> <p><b>You and Your Body</b> Activity 3, 5</p> <p><b>Pollution</b> Activity 10</p> <p><b>Solar Energy</b> Activity 3-8</p> <p><b>Flight and Rocketry</b> Activity 9</p> <p><b>Newton's Toy Box</b> Activity 8</p> <p><b>Famous Scientists</b> Activity 7</p> <p><b>Matter and Change</b> Activity 1-2</p> <p><b>Pollution</b> Activity 10</p> <p><b>You and Your Body</b> Activity 5</p> <p><b>Simple Machines</b> Activity 9</p> <p><b>Newton's Toy Box</b> Activity 7-9</p> <p><b>Earth, Mood and Sun</b> Activity 3-4</p> <p><b>Matter and Change</b> Activity 1-2</p>	<p>Pages 25-32, 41-48</p> <p>Pages 23-35</p> <p>Pages 39-54</p> <p>Pages 13-58</p> <p>Pages 25-32, 41-48</p> <p>Pages 59-64, 71-76</p> <p>Pages 65-76</p> <p>Pages 39-54</p> <p>Pages 7-21</p> <p>Pages 91-97</p> <p>Pages 41-48</p> <p>Pages 13-58</p> <p>Pages 39-49</p> <p>Pages 7-21</p> <p>Pages 65-75</p> <p>Pages 27-31, 41-48</p> <p>Pages 71-76</p> <p>Pages 21-58</p> <p>Pages 91-97</p> <p>Pages 45-49</p> <p>Pages 65-75</p> <p>Pages 7-21</p> <p>Pages 71-76</p> <p>Pages 41-48</p> <p>Pages 71-76</p> <p>Pages 39-54</p> <p>Pages 23-35</p> <p>Pages 7-21</p>
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**Concept C: Evidence is used to formulate explanations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
<p>a. Use quantitative and qualitative data as support for reasonable explanations (conclusions)</p>	<p>DSM modules emphasize the use of evidence to formulate explanations. See for example:  <b>Color and Light</b>                      Activity 4-7  <b>Electromagnetism</b>                      Activity 6  <b>Erosion</b>                      Activity 9-12  <b>Solar Energy</b>                      Activity 3-8  <b>Plants in Our World</b>                      Activity 3-6  <b>Electrical Connections</b>                      Activity 8-10</p>	<p>Pages 37-67                      Pages 43-48                      Pages 75-104                      Pages 21-58                      Pages 19-41                      Pages 53-70</p>
<p>b. Use data as support for observed patterns and relationships, and to make predictions to be tested</p>	<p><b>You and Your Body</b>                      Activity 5  <b>Pollution</b>                      Activity 10  <b>Solar Energy</b>                      Activity 3-8  <b>Electromagnetism</b>                      Activity 6  <b>Matter and Change</b>                      Activity 1-2  <b>Plants in Our World</b>                      Activity 1-2  <b>Newton's Toy Box</b>                      Activity 7-9</p>	<p>Pages 41-48                      Pages 71-76                      Pages 21-58                      Pages 43-48                      Pages 7-21                      Pages 19-24                      Pages 39-54</p>
<p>c. Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions)</p>	<p>DSM modules provide the opportunity for the teaching of this expectation. See the above activities.</p>	

**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
<p>a. Evaluate the reasonableness of an explanation (conclusion)</p>	<p>DSM modules encourage evaluation of explanations. See for example:  <b>Fungi-Small Wonders</b>                      Activity 7  <b>Pollution</b>                      Activity 10  <b>Erosion</b>                      Activity 9-12  <b>Weather Forecasting</b>                      Activity 5  <b>If Shipwrecks Could Talk</b></p>	<p>Pages 45-49                      Pages 71-76                      Pages 75-104                      Pages 41-48</p>

b. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories)	Activity 4 <b>Electrical Connections</b>	Pages 35-45
	Activity 1	Pages 7-12
	<b>Electromagnetism</b>	
	Activity 6	Pages 43-48
	<b>You and Your Body</b>	
	Activity 5	Pages 41-48
	<b>Pollution</b>	
	Activity 10	Pages 71-76
<b>Fungi-Small Wonders</b>		
Activity 7	Pages 45-49	
<b>Matter and Change</b>		
Activity 1-2	Pages 7-21	
<b>Plants in Our World</b>		
Activity 3	Pages 19-24	

**Concept E: The nature of science relies upon communication of results and justification of explanations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Communicate the procedures and results of investigations and explanations through: oral presentations drawings and maps data tables (allowing for the recording and analysis of data relevant to the experiment, such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities) graphs (bar, single line, pictograph) writings	DSM modules emphasize student communication. See for example:	
	<b>You and Your Body</b> Activity 3, 5	Pages 27-31, 41-48
	<b>Electromagnetism</b> Activity 6	Pages 43-48
	<b>Solar Energy</b> Activity 3-8	Pages 21-58
	<b>Simple Machines</b> Activity 6-9	Pages 49-76
	<b>Famous Scientists</b> Activity 2, 7	Pages 21-28, 65-75
	<b>Matter and Change</b> Activity 2, 12-13	Pages 15-21, 87-97

## STRAND 8

### Impact of Science, Technology and Human Activity

**1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs**

**Concept A: Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Explain how technological improvements, such as those developed for use in space exploration, the military, or medicine, have led to the invention of new products that may improve	<b>Earth, Moon and Sun</b> Activity 6, Science, Technology and Society	Page 52
	<b>Astronomy</b> Activity 3, Science, Technology and Society	Page 34

lives here on Earth (e.g., new materials, freeze-dried foods, infrared goggles, Velcro, satellite imagery, robotics, lasers)		
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**Concept B: Advances in technology often result in improved data collection and an increase in scientific information**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Identify the link between technological developments and the scientific discoveries made possible through their development (e.g., Hubble telescope and stellar evolution, composition and structure of the universe; the electron microscope and cell organelles; sonar and the composition of the Earth; manned and unmanned space missions and space exploration; Doppler radar and weather conditions; MRI and CAT-scans and brain activity)	<b>Astronomy</b> Activity 9 Activity 6, Science, Technology and Society Activity 9, Science, Technology and Society	Pages 77-83  Page 60  Page 83

**Concept C: Technological solutions to problems often have drawbacks as well as benefits**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Describe how technological solutions to problems (e.g., storm water runoff, fiber optics, windmills, efficient car design, electronic trains without conductors, sonar, robotics, Hubble telescope) can have both benefits and drawbacks (e.g., design constraints, unintended consequences, risks) (Assess Locally)	<b>Astronomy</b> Activity 1, Science, Technology and Society Activity 6, Science, Technology and Society	Page 16  Page 60

**2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time**

**Concept A: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		

<p>a. Describe how the contributions of scientists and inventors, representing different cultures, races, and gender, have contributed to science, technology and human activity (e.g., George Washington Carver, Thomas Edison, Thomas Jefferson, Isaac Newton, Marie Curie, Galileo, Albert Einstein, Mae Jemison, Edwin Hubble, Charles Darwin, Jonas Salk, Louis Pasteur, Jane Goodall, Tom Akers, John Wesley Powell, Rachel Carson) (Assess Locally)</p>	<p><b>Weather Forecasting</b> Activity 5, Science and Social Studies</p>	Page 48
	<p><b>Flight and Rocketry</b> Activity 6, Science and Language Arts</p>	Page 72
	<p>Activity 12, Science and Social Studies</p>	Page 130
	<p>Reader</p>	Page 14
	<p><b>You and Your Body</b> Reader</p>	Pages 12-13
	<p><b>Simple Machines</b> Reader</p>	Pages 12-13
	<p><b>Famous Scientists</b> Activity 1-12</p>	Pages 11-121
<p><b>Earth, Moon and Sun</b> Reader</p>	Page 20	
<p><b>Newton's Toy Box</b> Reader</p>	Page 22	

**Concept B: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
<p>a. Recognize the difficulty science innovators experience as they attempt to break through accepted ideas (hypotheses, laws, theories) of their time to reach conclusions that may lead to changes in those ideas and serve to advance scientific understanding (e.g., Darwin, Copernicus, Newton)</p>	<p><b>Famous Scientists</b> Activity 3</p>	Pages 29-34
	<p><b>Earth, Moon and Sun</b> Reader</p>	Pages 20
<p>b. Recognize explanations have changed over time as a result of new evidence</p>	<p><b>Matter and Change</b> Reader</p>	Page 22

**3. Science and technology affect, and are affected by, society**

**Concept B: Social, political, economic, ethical and environmental factors strongly influence, and are influenced by, the direction of progress of science and technology**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
<p>a. Describe ways in which science and society influence one another (e.g., scientific knowledge and the procedures used by scientists influence the way many individuals in society</p>		

<p>think about themselves, others, and the environment; societal challenges often inspire questions for scientific research; social priorities often influence research priorities through the availability of funding for research)</p> <p>b. Identify and evaluate the physical, social, economic, and/or environmental problems that may be overcome using science and technology (e.g., the need for alternative fuels, human travel in space, AIDS)</p>	<p><b>Earth, Moon and Sun</b> Activity 6, Science, Technology and Society</p>	<p>Page 52</p>
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# GRADE SEVEN

## STRAND 1

### Properties and Principles of Matter and Energy

#### 1. Changes in properties and states of matter provide evidence of the atomic theory of matter

**Concept D: Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Weather and Climate</i></p> <p>a. Describe the relationship between temperature and the movement of atmospheric gases (i.e., warm air rises due to expansion of the volume of gas, cool air sinks due to contraction of the volume of gas)</p>	<p>This expectation is address in the grade six module <u>Weather Forecasting</u>.</p>	

**Concept I: Mass is conserved during any physical or chemical change**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Weather and Climate</i></p> <p>a. Explain that the amount of matter remains constant while being recycled through the water cycle</p>		

#### 2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems

**Concept A: Forms of energy have a source, a means of transfer (work and heat), and a receiver**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Forms of Energy: Heat</i></p> <p>a. Recognize thermal energy as the random motion (kinetic energy) of molecules or atoms within a substance</p>	<p><b>Matter and Change</b> Reader</p>	<p>Page 12</p>
<p>b. Use the kinetic molecular model to explain changes in the temperature of a material</p>	<p><b>Matter and Change</b> Reader</p>	<p>Page 12</p>
<p>c. Recognize thermal energy is transferred as heat from warmer objects to cooler objects until both reach the same temperature (equilibrium)</p>		



pencil lead, plastic, glass, aluminum foil, lemon juice, air, water)		
m. Diagram and distinguish between complete series and parallel circuits	<b>Electrical Connections</b> Activity 3, 8-10	Pages 19-24, 53-70
n. Identify advantages and disadvantages of series and parallel circuits	<b>Electrical Connections</b> Activity 3, 8-10	Pages 19-24, 53-70

**Concept C: Electromagnetic energy from the Sun (solar radiation) is a major source of energy on Earth**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Weather and Climate</i>		
a. Identify solar radiation as the primary source of energy for weather phenomena	This expectation is addressed in the grade six module <u>Weather Forecasting</u> .	

**Concept F: Energy can change from one form to another within systems, but the total amount remains the same**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Energy Transformations</i>		
a. Identify the different energy transformations that occur between different systems (e.g., chemical energy in battery converted to electricity in circuit converted to light and heat from a bulb)	<b>Electrical Connections</b> Activity 2-3 <b>Famous Scientists</b> Activity 5-6	Pages 13-24 Pages 45-64
b. Recognize that, during an energy transformation, heat is often transferred from one object (system) to another because of a difference in temperature	<b>Electrical Connections</b> Activity 2-3, 7 <b>Famous Scientists</b> Activity 5	Pages 13-24, 45-61 Pages 45-54
c. Recognize energy is not lost but conserved as it is transferred and transformed	DSM activities provide the opportunity for the teaching of this expectation. See examples above.	

## STRAND 2

### Properties and Principles of Force and Motion

**1. The motion of an object is described by its change in position relative to another object or point**

**Concept A: The motion of an object is described as a change in position, direction, and speed relative to another object (frame of reference)**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Force, Motion, and Work</i>		

a. Describe the circular motion of a moving object as the result of a force acting toward the center	<b>Newton's Toy Box</b> Activity 6	Pages 35-38
b. Classify different types of motion (e.g., straight line, projectile, circular, vibrational)	<b>Newton's Toy Box</b> Activity 4-13 <b>Famous Scientist</b> Activity 6	Pages 25-70 Pages 55-64
c. Given an object in motion, calculate its speed (distance/time)	<b>Newton's Toy Box</b> Activity 7-8 Reader	Pages 39-49 Pages 2-3
d. Interpret a line graph representing an object's motion in terms of distance over time (speed) using metric units	<b>Newton's Toy Box</b> Activity 9, Science and Math Reader	Page 54 Page 3

## 2. Forces affect motion

**Concept A: Forces are classified as either contact forces (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude change in position, direction, and speed relative to another object (frame of reference)**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Force, Motion, and Work</i>		
a. Identify and describe the types of forces acting on an object in motion, at rest, floating/sinking (i.e., type of force, direction, amount of force in Newtons)	<b>Newton's Toy Box</b> Activity 1-13 Reader <b>Famous Scientists</b> Activity 2-3	Pages 7-70 Pages 4-8 Pages 21-34
b. Compare the forces acting on an object by using a spring scale to measure them to the nearest Newton	<b>Newton's Toy Box</b> Activity 2-3 <b>Famous Scientists</b> Activity 1	Pages 13-24 Pages 11-19

**Concept B: Every object exerts a gravitational force on every other object**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Force, Motion, and Work</i>		
a. Recognize every object exerts a gravitational force of attraction on every other object	<b>Newton's Toy Box</b> Activity 2-3 Reader <b>Famous Scientists</b> Activity 3	Pages 13-24 Page 8 Pages 29-43
b. Recognize an object's weight is a measure of the gravitational force of a planet/moon acting on that object	<b>Newton's Toy Box</b> Activity 2-3 Reader	Pages 13-24 Page 8
c. Compare the amount of gravitational force acting	DSM activities provide the opportunity for the teaching of	

between objects (which is dependent upon their masses and the distance between them)	this expectation. See for example: <b>Newton's Toy Box</b> Activity 2-3 <b>Famous Scientists</b> Activity 3	Pages 13-24 Pages 29-34
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**Concept D: Newton's Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Force, Motion, and Work</i>		
a. Compare the effects of balanced and unbalanced forces (including magnetic, gravity, friction, push or pull) on an object's motion	<b>Newton's Toy Box</b> Activity 2-13 Reader <b>Famous Scientists</b> Activity 3	Pages 13-70 Pages 8-13 Pages 29-34
b. Explain that when forces (including magnetic, gravity, friction, push or pull) are balanced, objects are at rest or their motion remains constant	<b>Newton's Toy Box</b> Activity 1 Reader <b>Famous Scientists</b> Activity 2	Pages 7-11 Pages 10-11 Pages 21-28
c. Explain that a change in motion is the result of an unbalanced force acting upon an object	DSM activities provide the opportunity for the teaching of this expectation. See for example: <b>Newton's Toy Box</b> Activity 2-13 Reader <b>Famous Scientists</b> Activity 3	Pages 13-70 Pages 12-13 Pages 29-34
d. Explain how the acceleration of a moving object is affected by the amount of net force applied and the mass of the object	<b>Newton's Toy Box</b> Activity 9 Activity 9, Science Extension	Pages 51-54 Page 54

**Concept F: Simple machines (levers, inclined planes, wheels and axles, pulleys) affect the forces applied to an object and/or direction of movement as work is done**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Force, Motion, and Work</i>		
a. Recognize examples of work being done on an object (force applied and distance moved in the direction of the applied force) with and without the use of simple machines	This expectation is addressed in the grade six module <u>Simple Machines</u> . <b>Newton's Toy Box</b> Reader	Page 14
b. Calculate the amount of work done when a force is applied to an object over a distance	This expectation is addressed in the grade six module <u>Simple Machines</u> . <b>Newton's Toy Box</b>	

( $W = F \times d$ )	Reader	Page 14
c. Explain how simple machines affect the amount of effort force, distance through which a force is applied, and/or direction of force while doing work	This expectation is addressed in the grade six module <u>Simple Machines</u> . <b>Newton's Toy Box</b> Reader	Pages 15-16
d. Recognize the amount of work output is never greater than the amount of work input, with or without the use of a simple machine	DSM activities provide the opportunity for the teaching of this expectation. See for example: <b>Newton's Toy Box</b> Reader	Pages 15-16
e. Evaluate simple machine designs to determine which design requires the least amount of effort force and explain why	DSM activities provide the opportunity for the teaching of this expectation. See for example: <b>Newton's Toy Box</b> Reader	Pages 15-21

### STRAND 3

#### Characteristics and Interactions of Living Organisms

Not assessed at this level

### STRAND 4

#### Changes in Ecosystems and Interactions of Organisms with their Environments

Not assessed at this level

### STRAND 5

#### Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures

**Concept C: The atmosphere (air) is composed of a mixture of gases, including water vapor, and minute particles**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Weather and Climate</i>		
a. Describe the composition of the Earth's atmosphere (i.e., mixture of gases, water and minute particles) and how it circulates as air masses	This expectation is addressed in the grade six module <u>Weather Forecasting</u> .	
b. Describe the role atmosphere (e.g., clouds, ozone) plays in		

precipitation, reflecting and filtering light from the Sun, and trapping heat energy emitted from the Earth's surface		
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**Concept D: Climate is a description of average weather conditions in a given area over time**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Weather and Climate</i></p> <p>a. Differentiate between weather and climate</p> <p>b. Identify factors that affect climate (e.g., latitude, altitude, prevailing wind currents, amount of solar radiation)</p>	<p>This expectation is addressed in the grade six module <u>Weather Forecasting</u>.</p>	

**2. Earth's Systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes**

**Concept E: Changes in the form of water as it moves through Earth's systems are described as the water cycle**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Weather and Climate</i></p> <p>a. Explain and trace the possible paths of water through the hydrosphere, geosphere, and atmosphere (i.e., the water cycle: evaporation, condensation, precipitation, surface runoff/ groundwater flow)</p> <p>b. Relate the different forms water can take (i.e., snow, rain, sleet, fog, clouds, dew, humidity) as it moves through the water cycle to atmospheric conditions (i.e., temperature, pressure, wind direction and speed, humidity) at a given geographic location</p> <p>c. Explain how thermal energy is transferred throughout the water cycle by the processes of convection, conduction, and radiation</p>	<p>This expectation is addressed in the grade six module <u>Weather Forecasting and Oceans</u>.</p> <p>This expectation is addressed in the grade six module <u>Weather Forecasting and Oceans</u>.</p>	

**Concept F: Constantly changing properties of the atmosphere occur in patterns which are described as weather**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Weather and Climate</i></p> <p>a. Explain how the differences in surface temperature, due to the different heating and cooling rates of water and soil, affect the temperature and movement of the air above</p> <p>b. Recognize the characteristics of air masses (i.e., high/low barometric pressure, temperature) and predict their effect on the weather in a given location</p> <p>c. Identify weather conditions associated with cold fronts and warm fronts</p> <p>d. Identify factors that affect weather patterns in a particular region (e.g., proximity to large bodies of water, latitude, altitude, prevailing wind currents, amount of solar radiation, location with respect to mountain ranges)</p> <p>e. Collect and interpret weather data (e.g., cloud cover, precipitation, wind speed and direction) from weather instruments and maps to explain present day weather and to predict the next day’s weather</p> <p>f. Recognize significant changes in temperature and barometric pressure may cause dramatic weather phenomena (i.e., severe thunderstorms, tornadoes, hurricanes)</p>	<p>This expectation is addressed in the grade six module <u>Weather Forecasting.</u></p> <p>This expectation is addressed in the grade six module <u>Weather Forecasting.</u></p> <p>This expectation is addressed in the grade six module <u>Weather Forecasting.</u></p> <p>This expectation is addressed in the grade six module <u>Weather Forecasting.</u></p>	

**3. Human activity is dependent upon and affects Earth’s resources and systems**

**Concept A: Earth’s materials are limited natural resources affected by human activity**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Energy Transformations</i></p> <p>a. Distinguish between renewable (e.g.,</p>		

<p>geothermal, hydroelectric) and nonrenewable (e.g., Fossil fuel) energy sources</p> <p><i>Scope and Sequence – Weather and Climate</i></p> <p>b. Provide examples of how the availability of fresh water for humans and other living organisms is dependent upon the water cycle</p>	<p>This expectation is addressed in the grade six module <u>Weather Forecasting and Oceans</u>.</p>	
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## STRAND 6

### Composition and Structure of the Universe and the Motion of the Objects Within It

#### 1. The universe has observable properties and structure

**Concept A: The Earth, Sun, and moon are part of a larger system that includes other planets and smaller celestial bodies**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Objects and Their Motion in the Solar System</i></p> <p>a. Classify celestial bodies in the solar system into categories: Sun, moon, planets, and other small bodies (i.e., asteroids, comets, meteors), based on physical properties</p> <p>b. Compare and contrast the size, composition, atmosphere, and surface of the planets (inner vs. outer) in our solar system and Earth's moon</p> <p>c. Identify the relative proximity of common celestial bodies (i.e., Sun, moon, planets, smaller celestial bodies such as comets and meteors, other stars) in the sky to the Earth</p>	<p><b>Earth, Moon and Sun</b> Activity 1-3, 10 Reader <b>Astronomy</b> Activity 5-6</p> <p><b>Earth, Moon and Sun</b> Activity 3-4 Reader <b>Astronomy</b> Activity 6</p> <p><b>Earth, Moon and Sun</b> Activity 4 <b>Astronomy</b> Activity 6</p>	<p>Pages 7-28, 79-86 Pages 2-3, 6-7, 13-15, 21-23</p> <p>Pages 43-60</p> <p>Pages 23-35 Pages 21-23</p> <p>Pages 53-60</p> <p>Pages 29-35 Pages 53-60</p>

**Concept B: The Earth has a composition and location suitable to sustain life**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Objects and Their Motion in the Solar System</i></p> <p>a. Describe how the Earth's placement in the solar system is favorable to sustain life (i.e., distance from the Sun,</p>	<p>DSM activities provide the opportunity for the teaching of this expectation. See for example: <b>Earth, Moon and Sun</b></p>	

temperature, atmosphere)	Reader	Pages 21-23
b. Compare and contrast the characteristics of Earth that support life with the characteristics of other planets that are considered favorable or unfavorable to life (e.g., atmospheric gases, extremely high/low temperatures)	DSM activities provide the opportunity for the teaching of this expectation. See for example: <b>Earth, Moon and Sun</b> Reader	Pages 21-23

**Concept C: Most of the information we know about the universe comes from the electromagnetic spectrum life**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Objects and Their Motion in the Solar System</i>		
a. Recognize stars are separated from one another by vast and different distances, which causes stars to appear smaller than the Sun	<b>Astronomy</b> Activity 8 <b>Earth, Moon and Sun</b> Reader	Pages 69-75  Page 4
b. Compare the distance light travels from the Sun to Earth to the distance light travels from other stars to Earth using light years	<b>Astronomy</b> Activity 8 <b>Earth, Moon and Sun</b> Reader	Pages 69-75  Page 4

**2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces**

**Concept A: The apparent position of the Sun and other stars, as seen from Earth, change in observable patterns**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Objects and Their Motion in the Solar System</i>		
a. Relate the apparent east-to-west changes in the positions of the Sun, other stars, and planets in the sky over the course of a day to Earth's counterclockwise rotation about its axis	<b>Earth, Moon and Sun</b> Activity 8 Reader <b>Astronomy</b> Activity 2	Pages 61-68 Pages 8-9  Pages 17-23
b. Describe the pattern that can be observed in the changes in number of hours of visible sunlight, and the time and location of sunrise and sunset, throughout the year	<b>Earth, Moon and Sun</b> Activity 9, Science and Math Reader	Page 78 Pages 11-12
c. Recognize, in the Northern Hemisphere, the Sun appears lower in the sky	<b>Earth, Moon and Sun</b> Activity 9 Reader	Pages 69-78 Pages 11-12

<p>during the winter and higher in the sky during the summer</p>	<p><b>Astronomy</b> Activity 5, Science Extension</p>	<p>Page 51</p>
<p>d. Recognize, in winter, the Sun appears to rise in the Southeast and set in the Southwest, accounting for a relatively short day length, and, in summer, the Sun appears to rise in the Northeast and set in the Northwest, accounting for a relatively long day length</p>	<p>DSM activities provide the opportunity for the teaching of this expectation. See for example: <b>Earth, Moon and Sun</b> Activity 1</p>	<p>Pages 7-13</p>
<p>f. Recognize the Sun is never directly overhead when observed from North America</p>	<p><b>Earth, Moon and Sun</b> Activity 9 Reader <b>Astronomy</b> Activity 5, Science Extension</p>	<p>Pages 69-78 Pages 11-12 Page 51</p>

**Concept B: The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Objects and Their Motion in the Solar System</i></p>		
<p>a. Observe the change in time and location of moon rise, moon set, and the moon's appearance relative to time of day and month over several months, and note the pattern in this change</p>	<p><b>Earth, Moon and Sun</b> Activity 2</p>	<p>Pages 15-21</p>
<p>b. Recognize the moon rises later each day due to its revolution around the Earth in a counterclockwise direction</p>	<p><b>Earth, Moon and Sun</b> Activity 2</p>	<p>Pages 15-21</p>
<p>c. Recognize the Moon is in the sky for roughly 12 hours in a 24-hour period (i.e., if the Moon rises at about 6 P.M., it will set at about 6 A.M.)</p>	<p><b>Earth, Moon and Sun</b> Activity 2</p>	<p>Pages 15-21</p>
<p>d. Recognize that one half of the Moon is always facing the Sun and, therefore, one half of the Moon is always lit</p>	<p><b>Earth, Moon and Sun</b> Activity 10 Reader</p>	<p>Pages 79-86 Pages 14-15</p>
<p>e. Relate the apparent change in the moon's position in the sky as it appears to move east-to-west over the course of a</p>	<p><b>Earth, Moon and Sun</b> Activity 10 Reader</p>	<p>Pages 79-86 Pages 14-15</p>

day to Earth's counterclockwise rotation about its axis		
f. Describe how the appearance of the moon that can be seen from Earth changes approximately every 28 days in an observable pattern (moon phases)	<b>Earth, Moon and Sun</b> Activity 10 Reader	Pages 79-86 Pages 14-15

**Concept C: The regular and predictable motions of a planet and moon relative to the Sun explain natural phenomena on a planet, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Objects and Their Motion in the Solar System</i>		
a. Illustrate and explain a day as the time it takes a planet to make a full rotation about its axis	<b>Earth, Moon and Sun</b> Activity 6, 8 Reader <b>Astronomy</b> Activity 2	Pages 45-52, 61-68 Page 8  Pages 17-23
b. Diagram the path (orbital ellipse) the Earth travels as it revolves around the Sun	<b>Earth, Moon and Sun</b> Activity 8 Reader	Pages 61-68 Page 10
c. Illustrate and explain a year as the time it takes a planet to revolve around the Sun	<b>Earth, Moon and Sun</b> Activity 9 Reader	Pages 69-78 Page 10
d. Explain the relationships between a planet's length of year (period of revolution) and its position in the solar system	DSM activities provide the opportunity for the teaching of this expectation. See for example: <b>Earth, Moon and Sun</b> Reader	Pages 21-23
e. Describe how the moon's relative position changes as it revolves around the Earth	<b>Earth, Moon and Sun</b> Activity 10 Reader	Pages 79-86 Pages 4-5
f. Recognize the phases of the moon are due to the relative positions of the Moon with respect to the Earth and Sun	<b>Earth, Moon and Sun</b> Activity 10 Reader	Pages 79-86 Pages 4-5
g. Relate the axial tilt and orbital position of the Earth as it revolves around the Sun to the intensity of sunlight falling on different parts of the Earth during different seasons	<b>Earth, Moon and Sun</b> Activity 9 Reader <b>Astronomy</b> Activity 5, Science Extension	Pages 69-78 Pages 11-12  Page 51

**Concept D: Gravity is a force of attraction between objects in the solar system that governs their motion**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence — Objects and Their Motion in the Solar System</i>		
a. Describe how the Earth's gravity pulls any object on or near the Earth toward it (including natural and artificial satellites)	<b>Earth, Moon and Sun</b> Activity 12 Reader <b>Newton's Toy Box</b> Activity 2-3	Pages 95-102 Page 5  Pages 13-24
b. Describe how the planets' gravitational pull keeps satellites and moons in orbit around them	<b>Earth, Moon and Sun</b> Reader	Page 5
c. Describe how the Sun's gravitational pull holds the Earth and other planets in their orbits	<b>Earth, Moon and Sun</b> Reader	Page 5

## STRAND 7 Scientific Inquiry

**1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking**

**Concept A: Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Formulate testable questions and hypotheses	DSM modules emphasize formulating questions and using appropriate methods to gather evidence. See for example: <b>Plants in Our World</b> Activity 3, 5 <b>Newton's Toy Box</b> Activity 8-9 <b>Famous Scientists</b> Activity 7 <b>Electrical Connections</b> Activity 8-10 <b>Matter and Change</b> Activity 12	Pages 19-24, 31-36  Pages 45-54  Pages 65-75  Pages 53-70  Pages 87-92
b. Recognize the importance of the independent variable, dependent variables, control of constants, and multiple trials to the design of a valid experiment	<b>Plants in Our World</b> Activity 3 <b>Famous Scientists</b> Activity 7 <b>Matter and Change</b> Activity 12	Pages 19-24  Pages 65-75  Pages 87-92
c. Design and conduct a valid	<b>Plants in Our World</b>	

experiment	Activity 3 <b>Famous Scientists</b> Activity 7 <b>Matter and Change</b> Activity 12	Pages 19-24  Pages 65-75  Pages 87-92
d. Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment	DSM provides opportunity for students to evaluate experimental design. See activities above.	
e. Recognize that different kinds of questions suggest different kinds of scientific investigations (e.g., some involve observing and describing objects organisms, or events; some involve collecting specimens; some involve experiments; some involve making observations in nature; some involve discovery of new objects and phenomena; some involve making models)	DSM provides opportunity for students to be involved in a variety of data gathering methods. See for example: <b>Earth Processes</b> Activity 3 <b>Astronomy</b> Activity 1-2 <b>Newton's Toy Box</b> Activity 7-12 <b>Famous Scientists</b> Activity 1-2 <b>Matter and Change</b> Activity 10-13 <b>Plants in Our World</b> Activity 5-7	Pages 21-29  Pages 7-23  Pages 39-70  Pages 11-28  Pages 73-97  Pages 31-50
f. Acknowledge there is no fixed procedure called "the scientific method", but some investigations involve systematic observations, carefully collected and relevant evidence, logical reasoning, and imagination in developing hypotheses and other explanations	DSM modules provide the opportunity to teach this concept. See activities listed above in parts a-e.	

**Concept B: Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Make qualitative observations using the five senses	DSM modules allow for qualitative and quantitative evidence to be used in gathering evidence. See for example: <b>Earth Processes</b> Activity 10-12 <b>Newton's Toy Box</b> Activity 7-12 <b>Famous Scientists</b> Activity 1-3 <b>Matter and Change</b> Activity 1-3, 10-13	Pages 77-93  Pages 39-70  Pages 11-34  Pages 7-28, 73-97

	<b>Electrical Connections</b> Activity 1-2	Pages 7-18
b. Determine the appropriate tools and techniques to collect data	<b>Newton's Toy Box</b> Activity 7-9 <b>Famous Scientists</b> Activity 2, 7 <b>Matter and Change</b> Activity 1-2 <b>Plants in Our World</b> Activity 3, 5 <b>If Shipwrecks Could Talk</b> Activity 4	Pages 39-54 Pages 21-28, 65-75 Pages 7-21 Pages 19-24, 31-36 Pages 35-45
c. Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders, stopwatches)	<b>Newton's Toy Box</b> Activity 7-9 <b>Famous Scientists</b> Activity 7 <b>Matter and Change</b> Activity 1-2 <b>Plants in Our World</b> Activity 3 <b>If Shipwrecks Could Talk</b> Activity 6 <b>Earth, Moon and Sun</b> Activity 3-4	Pages 39- 54 Pages 65-75 Pages 7-21 Pages 19-24 Pages 57-68 Pages 23-35
d. Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, force (weight) to the nearest Newton, temperature to the nearest degree Celsius, time to the nearest second	<b>Newton's Toy Box</b> Activity 7-9 <b>Famous Scientists</b> Activity 7 <b>Matter and Change</b> Activity 1-2 <b>Plants in Our World</b> Activity 3 <b>Earth, Moon and Sun</b> Activity 3-4	Pages 39-54 Pages 65-75 Pages 7-21 Pages 19-24 Pages 23-35
e. Compare amounts/measurements	<b>Newton's Toy Box</b> Activity 7-9 <b>Famous Scientists</b> Activity 7 <b>Matter and Change</b> Activity 1-2 <b>Plants in Our World</b> Activity 3 <b>Earth, Moon and Sun</b> Activity 3-4	Pages 39-54 Pages 65-75 Pages 7-21 Pages 19-24 Pages 23-35
f. Judge whether measurements and computation of quantities are reasonable	<b>Newton's Toy Box</b> Activity 7-9 <b>Famous Scientists</b> Activity 7 <b>Matter and Change</b> Activity 1-2 <b>Plants in Our World</b> Activity 3 <b>Earth, Moon and Sun</b> Activity 3-4	Pages 39-54 Pages 65-75 Pages 7-21 Pages 19-24 Pages 23-35

g. Calculate the range and average/mean of a set of data		
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**Concept C: Evidence is used to formulate explanations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Use quantitative and qualitative data as support for reasonable explanations (conclusions)	DSM activities emphasize that students use evidence to make explanations. See for example: <b>Newton's Toy Box</b> Activity 7-9 <b>Famous Scientists</b> Activity 2, 7 <b>Plants in Our World</b> Activity 3, 5 <b>If Shipwrecks Could Talk</b> Activity 7 <b>Astronomy</b> Activity 5-6	Pages 39-54  Pages 21-28, 65-75  Pages 19-24, 31-36  Pages 69-76  Pages 43-60
b. Use data as support for observed patterns and relationships, and to make predictions to be tested	<b>Newton's Toy Box</b> Activity 7-9 <b>Famous Scientists</b> Activity 2, 7 <b>Plants in Our World</b> Activity 3 <b>Matter and Change</b> Activity 1-2 <b>Earth Processes</b> Activity 10	Pages 39-54  Pages 21-28, 65-75  Pages 19-24  Pages 7-21  Pages 77-82
c. Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions)	DSM activities provide the opportunity for the teaching of this expectation. See for example: See examples above.	

**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Evaluate the reasonableness of an explanation (conclusion)	DSM activities provide the opportunity to teach these expectations. See for example: <b>Earth Processes</b> Activity 10-12 <b>Plants in Our World</b> Activity 3, 5-6 <b>Newton's Toy Box</b> Activity 7-10 <b>Famous Scientists</b> Activity 1-3 <b>Electrical Connections</b> Activity 8-10	Pages 77-93  Pages 19-24, 31-41  Pages 39-58  Pages 11-34  Pages 53-70

b. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories)	<b>Matter and Change</b> Activity 11-13	Pages 81-97
	<b>Earth Processes</b> Activity 10-12	Pages 77-93
	<b>Plants in Our World</b> Activity 3, 5-6	Pages 19-24, 31-41
	<b>Newton's Toy Box</b> Activity 7-10	Pages 39-58
	<b>Famous Scientists</b> Activity 1-3	Pages 11-34
	<b>Electrical Connections</b> Activity 8-10	Pages 53-70
	<b>Matter and Change</b> Activity 11-13	Pages 81-97

**Concept E: The nature of science relies upon communication of results and justification of explanations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Communicate the procedures and results of investigations and explanations through: oral presentations drawings and maps data tables (allowing for the recording and analysis of data relevant to the experiment, such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities) graphs (bar, single line, pictograph) equations and writings	DSM activities provide the opportunity to teach these expectations. See for example: <b>Earth Processes</b> Activity 10 <b>Plants in Our World</b> Activity 3-6 <b>Newton's Toy Box</b> Activity 7-10 <b>Famous Scientists</b> Activity 7-8 <b>Electrical Connections</b> Activity 8-10 <b>Matter and Change</b> Activity 1-3	Pages 77-82 Pages 19-41 Pages 39-58 Pages 65-84 Pages 53-64 Pages 7-28

## STRAND 8

### Impact of Science, Technology and Human Activity

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs

**Concept A: Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Explain how technological improvements, such as those developed for use in space exploration, the military, or medicine, have led to the invention of new products that may improve lives here on Earth (e.g.,	<b>Earth, Moon and Sun</b> Activity 6, Science, Technology and Society <b>Astronomy</b> Activity 3, Science, Technology and Society	Page 52 Page 34

new materials, freeze-dried foods, infrared goggles, Velcro, satellite imagery, robotics, lasers)		
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**Concept B: Advances in technology often result in improved data collection and an increase in scientific information**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Identify the link between technological developments and the scientific discoveries made possible through their development (e.g., Hubble telescope and stellar evolution, composition and structure of the universe; the electron microscope and cell organelles; sonar and the composition of the Earth; manned and unmanned space missions and space exploration; Doppler radar and weather conditions; MRI and CAT-scans and brain activity)	<b>Astronomy</b> Activity 9 Activity 6, Science, Technology and Society Activity 9, Science, Technology and Society	Pages 77-83  Page 60  Page 83

**Concept C: Technological solutions to problems often have drawbacks as well as benefits**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Describe how technological solutions to problems (e.g., storm water runoff, fiber optics, windmills, efficient car design, electronic trains without conductors, sonar, robotics, Hubble telescope) can have both benefits and drawbacks (e.g., design constraints, unintended consequences, risks) (Assess Locally)	<b>Astronomy</b> Activity 1, Science, Technology and Society Activity 6, Science, Technology and Society	Page 16  Page 60

**2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time**

**Concept A: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Describe how the	<b>Famous Scientists</b>	

contributions of scientists and inventors, representing different cultures, races, and gender, have contributed to science, technology and human activity (e.g., George Washington Carver, Thomas Edison, Thomas Jefferson, Isaac Newton, Marie Curie, Galileo, Albert Einstein, Mae Jemison, Edwin Hubble, Charles Darwin, Jonas Salk, Louis Pasteur, Jane Goodall, Tom Akers, John Wesley Powell, Rachel Carson) (Assess Locally)	Activity 1-12 <b>Earth, Moon and Sun</b> Reader <b>Newton's Toy Box</b> Reader <b>Astronomy</b> Activity 9, Science and Language Arts <b>Matter and Change</b> Reader	Pages 11-121  Page 20  Page 22  Page 83  Page 21
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**Concept B: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Recognize the difficulty science innovators experience as they attempt to break through accepted ideas (hypotheses, laws, theories) of their time to reach conclusions that may lead to changes in those ideas and serve to advance scientific understanding (e.g., Darwin, Copernicus, Newton)	<b>Famous Scientists</b> Activity 3 <b>Earth, Moon and Sun</b> Reader	Pages 29-34  Page 20
b. Recognize explanations have changed over time as a result of new evidence	<b>Matter and Change</b> Reader	Page 22

**3. Science and technology affect, and are affected by, society**

**Concept B: Social, political, economic, ethical and environmental factors strongly influence, and are influenced by, the direction of progress of science and technology**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Describe ways in which science and society influence one another (e.g., scientific knowledge and the procedures used by scientists influence the way many individuals in society think about themselves, others, and	<b>Earth, Moon and Sun</b> Activity 6, Science, Technology and Society	Page 52

<p>the environment; societal challenges often inspire questions for scientific research; social priorities often influence research priorities through the availability of funding for research)</p> <p>b. Identify and evaluate the physical, social, economic, and/or environmental problems that may be overcome using science and technology (e.g., the need for alternative fuels, human travel in space, AIDS)</p>		
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# GRADE EIGHT

## STRAND 1

### Properties and Principles of Matter and Energy

#### 1. Changes in properties and states of matter provide evidence of the atomic theory of matter

**Concept A: Objects, and the materials they are made of, have properties that can be used to describe and classify them**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Physical and Chemical Properties and Changes of Matter</i></p> <p>a. Recognize elements (unique atoms) and compounds (molecules or crystals) are pure substances that have characteristic properties</p> <p>b. Describe the physical and chemical properties (e.g., magnetic attraction, conductivity, melting point and boiling point, reactivity) of pure substances (elements or compounds) (e.g., copper wire, aluminum wire, iron, charcoal, sulfur, water, salt, sugar, sodium bicarbonate, galena, quartz, magnetite, pyrite) using appropriate senses and tools</p>	<p><b>Matter and Change</b> Activity 5 Reader</p> <p><b>Matter and Change</b> Reader</p>	<p>Pages 37-42 Pages 2-8</p> <p>Pages 4-5</p>

**Concept C: Objects, and the materials they are made of, have properties that can be used to describe and classify them**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Physical and Chemical Properties and Changes of Matter</i></p> <p>a. Describe evidence (e.g., diffusion of colored material into clear material such as water; light reflecting off of dust particles in air; changes in physical properties and reactivity such as gold hammered into foil, oil spreading on the surface of water, decay of organic matter, condensation of water vapor by increased pressure) that supports</p>	<p><b>Matter and Change</b> Activity 1-3, 12-13 Reader</p> <p><b>Plants in Our World</b> Activity 5-6</p> <p><b>Electrical Connections</b> Activity 1-2</p>	<p>Pages 7-28, 87-87 Pages 9-12</p> <p>Pages 37-50</p> <p>Pages 7-18</p>

the theory that matter is composed of moving particles too small to be seen (atoms, molecules)		
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**Concept D: Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Physical and Chemical Properties and Changes of Matter</i>		
a. Using the Kinetic Theory model, illustrate and account for the physical properties (i.e., shape, volume, malleability, viscosity) of a solid, liquid, or gas in terms of the arrangement and motion of molecules in a substance	DSM activities provide the opportunity to teach this expectation. See below: <b>Matter and Change</b> Activity 1-3 Reader	Pages 7-28 Pages 10-12
b. Use the Kinetic Theory model to explain changes in the volume, shape, and viscosity of materials in response to temperature changes during a phase change	DSM activities provide the opportunity to teach this expectation. See below: <b>Matter and Change</b> Reader	Pages 11-2
c. Predict the effect of transfer on the physical properties of a substance as it changes to or from a solid, liquid, or gas (i.e., phase changes that occur during freezing, melting, evaporation, boiling, condensation)	<b>Matter and Change</b> Reader	Pages 11-12

**Concept F: The periodic table organizes the elements according to their atomic structure and chemical reactivity**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Physical and Chemical Properties and Changes of Matter</i>		
a. Recognize more than 100 known elements (unique atoms) exist that may be combined in nature or by man to produce compounds that make up the living and nonliving substances in the environment (Do NOT assess memorization of the Periodic Table)	<b>Matter and Change</b> Activity 5-7 Reader	Pages 37-57 Pages 4-8

**Concept I: Mass is conserved during any physical or chemical change**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Physical and Chemical Properties and Changes of Matter</i></p> <p>a. Provide evidence that mass is conserved during a chemical change in a closed system (e.g., vinegar + baking soda, mold growing in a closed container, steel wool rusting)</p>	<p><b>Matter and Change</b> Activity 7 Reader</p>	<p>Pages 53-57 Pages 17-18</p>
<p><i>Scope and Sequence – Rock Cycle and Plate Tectonics</i></p> <p>b. Explain that the amount of matter remains constant while being recycled through the rock cycle</p>	<p>DSM activities provide the opportunity to teach this expectation. See below: <b>Earth Processes</b> Activity 4-6 Reader</p>	<p>Pages 31-53 Pages 16-18</p>
<p><i>Scope and Sequence – Cells and Body Systems</i></p> <p>c. Explain that the amount of matter remains constant while being recycled through food chains and food webs</p>		

**2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems**

**Concept A: Forms of energy have a source, a means of transfer (work and heat), and a receiver**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Physical and Chemical Properties and Changes of Matter</i></p> <p>a. Recognize chemical energy is stored in chemical compounds (e.g., energy stored in and released from food molecules, batteries, nitrogen explosives, fireworks, organic fuels)</p>	<p><b>Electrical Connections</b> Activity 1-2 <b>Plants in Our World</b> Activity 11</p>	<p>Pages 7-18 Pages 69-75</p>

**Concept F: Energy can change from one form to another within systems, but the total amount remains the same**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence – Physical and Chemical Properties and Changes of Matter</i></p> <p>a. Identify the evidence of different energy transformations (e.g.,</p>	<p><b>Electrical Connections</b> Activity 2-3 <b>Famous Scientists</b></p>	<p>Pages 13-24</p>

explosion of light, heat, and sound, temperature change, electrical charge) that may occur as chemical energy is released during a chemical reaction)	Activity 5	Pages 45-54
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## STRAND 2

### Properties and Principles of Force and Motion

Not assessed at this level

## STRAND 3

### Characteristics and Interactions of Living Organisms

#### 1. There is a fundamental unity underlying the diversity of all living organisms

##### Concept A: Organisms have basic needs for survival

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Cells and Body Systems</i> a. Recognize that most plants and animals require food and oxygen (needed to release the energy from that food)	DSM activities provide this opportunity to teach this expectation. See below: <b>Plants in Our World</b> Activity 8-11	Pages 51-75

##### Concept D: Plants and animals have different structures that serve similar functions necessary for the survival of the organism

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Cells and Body Systems</i> a. Identify and contrast the structures of plants and animals that serve similar functions (e.g., taking in water and oxygen, support, response to stimuli, obtaining energy, circulation, digestion, excretion, reproduction)	DSM activities provide this opportunity to teach this expectation. See below: <b>Plants in Our World</b> Activity 2, 4, 8-11	Pages 13-18, 25-30, 51-75

#### 2. Living organisms carry out life processes in order to survive

##### Concept A: The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Cells and Body Systems</i> a. Recognize the cell membrane helps regulate the transfer of materials in and out of the cell	<b>Plants in Our World</b> Activity 1	Pages 7-12
	<b>DNA-From Genes to Proteins</b> Activity 4	Pages 25-29
b. Recognize the function of the chloroplast is	<b>Plants in Our World</b> Activity 1	Pages 7-12

photosynthesis		
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**Concept B: Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Cells and Body Systems</i>		
a. Recognize photosynthesis is a chemical change with reactants (water and carbon dioxide) and products (energy-rich sugar molecules and oxygen) that takes place in the presence of light and chlorophyll	<b>Plants in Our World</b> Activity 8-9	Pages 51-61
b. Recognize oxygen is needed by all cells of most organisms for the release of energy from nutrient (sugar) molecules (Do NOT assess the term cellular respiration)	<b>Plants in Our World</b> Activity 10	Pages 63-68
c. Describe the importance of the transport and exchange of oxygen and carbon dioxide to the survival of the organism	<b>Plants in Our World</b> Activity 5-6, 10	Pages 31-41, 63-68

**Concept C: Complex multicellular organisms have systems that interact to carry out life processes through physical and chemical means**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Cells and Body Systems</i>		
a. Identify and give examples of each level of organization (cell, tissue, organ, organ system) in multicellular organisms (plants, animals)	DSM activities provide this opportunity to teach this expectation. See below: <b>Plants in Our World</b> Activity 1-2, 4	Pages 7-18, 25-30
b. Illustrate and explain the path water and nutrients take as they move through the transport system of a plant	<b>Plants in Our World</b> Activity 2	Pages 12-18
c. Explain the interactions between the circulatory and digestive systems as nutrients are processed by the digestive system, passed into the blood stream, and transported in and out of the cell		
d. Compare and contrast the processes of mechanical		

<p>and chemical digestion, and their role in providing materials necessary for survival of the cell and organism</p> <p>e. Identify the importance of the transport and exchange of nutrient and waste molecules to the survival of the cell and organism</p> <p>f. Explain the interactions between the circulatory and respiratory systems in exchanging oxygen and carbon dioxide between cells and the atmosphere (when oxygen enters the body, passes into the blood stream, and is transported into the cell; carbon dioxide is transported out of the cell, passes into the blood stream, and exits the body)</p> <p>g. Explain the interactions between the nervous and muscular systems when an organism responds to a stimulus</p>		
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**Concept F: Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<p><i>scope and Sequence – Cells and Body Systems</i></p> <p>a. Predict the response the body may take to maintain internal balance during an environmental change (e.g., shivering when cold, slowing metabolism when food supply decreases or when dehydrated, adrenaline rush when frightened)</p>		

**Concept G: Life processes can be disrupted by disease (intrinsic failures of the organ systems or by infection due to other organisms)**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<p><i>Scope and Sequence – Disease</i></p> <p>a. Explain the cause and effect of diseases (e.g., AIDS, cancer, diabetes, hypertension) on the human body</p>		

<p>b. Relate some common diseases (i.e., cold, influenza, strep throat, dysentery, fungal infections) to the organisms that cause them (bacteria, viruses, protists, fungi)</p> <p>c. Differentiate between infectious and noninfectious diseases</p> <p>d. Explain the role of antibiotics and vaccines in the treatment and prevention of diseases</p>		
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**3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes**

**Concept A: Reproduction can occur asexually or sexually**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Reproduction and Heredity</i>		
a. Compare and contrast the processes of asexual and sexual reproduction, including the type and number of cells involved (one body cell in asexual, two sex cells in sexual), and the number of gene sets (body cell has two sets, sex cells have one set each) passed from parent(s) to offspring	DSM activities provide this opportunity to teach this expectation. See below: <b>DNA – From Genes to Protein</b> Activity 5, Science Extension	Page 35
b. Identify examples of asexual reproduction (i.e., plants budding, binary fission of single cell organisms)	<b>DNA – From Genes to Protein</b> Activity 11, Science and Math	Page 79
c. Compare and contrast the reproductive mechanisms of classes of vertebrates (i.e., internal vs. external fertilization)		
d. Explain how flowering plants reproduce sexually		

**Concept C: Chromosomes are components of cells that occur in pairs and carry hereditary information from one cell to daughter cells and from parent to offspring during reproduction**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Reproduction and Heredity</i>		
a. Identify chromosomes as	<b>DNA – From Genes to</b>	

cellular structures that occur in pairs that carry hereditary information in units called genes	<b>Protein</b> Activity 10	Pages 69-74
b. Recognize that when asexual reproduction occurs, the same genetic information found in the parent cell is copied and passed on to each new daughter cell (Assess only the concept – not the term or process of mitosis)	<b>DNA – From Genes to Protein</b> Activity 5, Science Extension	Page 35
c. Recognize that when sexual reproduction occurs, genetic material from both parents is passed on and combined to form the genetic code for the new organism (Assess only the concept – not the term or process of meiosis)	<b>DNA – From Genes to Protein</b> Activity 3, Science Challenge Activity 3, Science Extension Activity 5, Science Extension	Page 23 Page 23 Page 35

**Concept D: There is heritable variation within every species of organism**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Reproduction and Heredity</i>		
a. Recognize that when asexual reproduction occurs, the daughter cell is identical to the parent cell (assuming no change in the parent genes)	<b>DNA – From Genes to Protein</b> Activity 5, Science Extension	Page 35
b. Recognize that when sexual reproduction occurs, the offspring is not identical to either parent due to the combining of the different genetic codes contained in each sex cell	<b>DNA – From Genes to Protein</b> Activity 3, Science Challenge Activity 3, Science Extension Activity 5, Science Extension	Page 23 Page 23 Page 35

## STRAND 4

### Changes in Ecosystems and Interactions of Organisms with their Environments

**1. Organisms are interdependent with one another and with their environment**

**Concept D: The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Disease</i>		
a. Explain the beneficial or detrimental impact that some organisms (i.e., viruses, bacteria, protists,	<b>DNA - From Genes to Protein</b> Activity 11, Science Extension	Page 79

fungi) may have on other organisms (e.g., diseases, antibiotics, breakdown of waste, fermentation)		
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## 2. Matter and energy flow through an ecosystem

### Concept B: Matter is recycled through an ecosystem

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Cells and Body Systems</i>		
a. Illustrate the oxygen/carbon dioxide cycles	<b>Plants in Our World</b> Activity 5-6	Pages 31-41
b. Describe the processes involved in the recycling of matter in the oxygen/carbon dioxide cycles	DSM activities provide the opportunity to teach this expectation. See below: <b>Plants in Our World</b> Activity 5-6	Pages 31-41

## STRAND 5

### Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

#### 1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures

##### Concept A: The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence – Rock Cycle and Plate Tectonics</i>		
a. Differentiate between minerals and rocks (which are composed of different kinds of minerals)	<b>Earth Processes</b> Reader	Page 16
b. Describe the distinguishing properties that can be used to classify minerals (i.e., texture, smell, luster, hardness, crystal shape, streak, reaction to magnets and acids)		
c. Describe the methods used to identify the distinguishing properties of minerals		
d. Classify rocks as sedimentary, igneous, or metamorphic	<b>Earth Processes</b> Activity 4-6 Reader	Pages 31-53 Pages 16-18

**2. Earth's Systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes**

**Concept B: There are internal processes and sources of energy within the geosphere that cause changes in Earth's crustal plates**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Rock Cycle and Plate Tectonics</i>		
a. Explain convection currents are the result of uneven heating inside the mantle resulting in the melting of rock materials, convection of magma, eruption/flow of magma, and movement of crustal plates	<b>Earth Processes</b> Activity 12 Reader	Pages 89-93 Page 3
b. Explain how rock layers are affected by the folding, breaking, and uplifting of rock layers due to plate motion	<b>Earth Processes</b> Activity 7 Reader	Pages 55-60 Pages 7-9
c. Describe how the movement of crustal plates can cause earthquakes and volcanic eruptions that can result in mountain building and trench formation	<b>Earth Processes</b> Activity 8, 10 Reader	Pages 61-68, 77-82 Pages 7-10

**Concept C: Continual changes in the Earth's materials and surface that result from internal and external processes is described by the rock cycle**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Rock Cycle and Plate Tectonics</i>		
a. Explain how heating and cooling in the mantle layer leads to the formation of metamorphic rocks and some igneous rocks	DSM activities provide the opportunity to teach this expectation. See below: <b>Earth Processes</b> Activity 5-6 Reader	Pages 39-46 Pages 16-18
b. Make inferences about the formation of igneous and metamorphic rocks from their physical properties (e.g., crystal size indicates rate of cooling, air pockets or glassy texture indicate volcanic activity)	<b>Earth Processes</b> Activity 5-6 Reader	Pages 39-46 Pages 16-18
c. Explain and diagram the external and internal processes of the rock cycle (e.g., weathering and erosion, sedimentation, compaction, heating, recrystallization,	<b>Earth Processes</b> Activity 6 Reader	Pages 47-53 Pages 16-18

resurfacing due to forces that drive plate motion)		
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**Concept D: Changes in the Earth over time can be inferred through rock and DSMil evidence**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence – Rock Cycle and Plate Tectonics</i>		
a. Describe the methods used to estimate geologic time and the age of the Earth (e.g., techniques used to date rocks and rock layers, presence of fossils)	<b>Earth Processes</b> Activity 4, Science Challenge Reader	Page 38 Page 22
b. Use rock and fossil evidence to make inferences about the age, history, and changing life forms and environment of the Earth (i.e., changes in successive layers of sedimentary rock and the Fossils contained within them, similarities between Fossils in different geographic locations, similarities between Fossils and organisms present today, Fossils of organisms indicating changes in climate, Fossils of extinct organisms)	<b>Earth Processes</b> Reader	Page 22

**STRAND 6**  
**Composition and Structure of the Universe and the Motion of the Objects Within It**

Not assessed at this level

**STRAND 7**  
**Scientific Inquiry**

**1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking**

**Concept A: Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>scope and Sequence - All Units</i>		
a. Formulate testable questions and hypotheses	DSM modules emphasize formulating questions and using appropriate methods to gather evidence. See for example:	

	<p><b>Plants in Our World</b> Activity 3, 5</p> <p><b>Newton’s Toy Box</b> Activity 8-9</p> <p><b>Famous Scientists</b> Activity 7</p> <p><b>Electrical Connections</b> Activity 8-10</p> <p><b>Matter and Change</b> Activity 12</p>	<p>Pages 19-24, 31-36</p> <p>Pages 45-54</p> <p>Pages 65-75</p> <p>Pages 53-70</p> <p>Pages 87-92</p>
b. Recognize the importance of the independent variable, dependent variables, control of constants, and multiple trials to the design of a valid experiment	<p><b>Plants in Our World</b> Activity 3</p> <p><b>Famous Scientists</b> Activity 7</p> <p><b>Matter and Change</b> Activity 12</p>	<p>Pages 19-24</p> <p>Pages 65-75</p> <p>Pages 87-92</p>
c. Design and conduct a valid experiment	<p><b>Plants in Our World</b> Activity 3</p> <p><b>Famous Scientists</b> Activity 7</p> <p><b>Matter and Change</b> Activity 12</p>	<p>Pages 19-24</p> <p>Pages 65-75</p> <p>Pages 87-92</p>
d. Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment	<p>DSM provides opportunity for students to evaluate experimental design. See activities above.</p>	
e. Recognize that different kinds of questions suggest different kinds of scientific investigations (e.g., some involve observing and describing objects organisms, or events; some involve collecting specimens; some involve making observations in nature; some involve discovery of new objects and phenomena; some involve making models)	<p>DSM provides opportunity for students to be involved in a variety of data gathering methods. See for example:</p> <p><b>Earth Processes</b> Activity 3</p> <p><b>Astronomy</b> Activity 1-2</p> <p><b>Newton’s Toy Box</b> Activity 7-12</p> <p><b>Famous Scientists</b> Activity 1-2</p> <p><b>Matter and Change</b> Activity 10-13</p> <p><b>Plants in Our World</b> Activity 5-7</p>	<p>Pages 21-29</p> <p>Pages 7-23</p> <p>Pages 39-70</p> <p>Pages 11-28</p> <p>Pages 73-97</p> <p>Pages 31-50</p>
f. Acknowledge there is no fixed procedure called “the scientific method”, but some investigations involve systematic observations, carefully collected and relevant evidence, logical reasoning, and imagination in developing hypotheses and other	<p>DSM modules provide the opportunity to teach this concept. See activities listed above in parts a-e.</p>	

explanations		
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**Concept B: Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence - All Units</i>		
a. Make qualitative observations using the five senses	DSM modules allow for qualitative and quantitative evidence to be used in gathering evidence. See for example: <b>Earth Processes</b> Activity 10-12 <b>Newton's Toy Box</b> Activity 7-12 <b>Famous Scientists</b> Activity 1-3 <b>Matter and Change</b> Activity 1-3, 10-13 <b>Electrical Connections</b> Activity 1-2	Pages 77-93 Pages 39-70 Pages 11-34 Pages 7-28, 73-97 Pages 7-18
b. Determine the appropriate tools and techniques to collect data	<b>Newton's Toy Box</b> Activity 7-9 <b>Famous Scientists</b> Activity 2, 7 <b>Matter and Change</b> Activity 1-2 <b>Plants in Our World</b> Activity 3, 5 <b>If Shipwrecks Could Talk</b> Activity 4	Pages 39-54 Pages 21-28, 65-75 Pages 7-21 Pages 19-24, 31-36 Pages 35-45
c. Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders, stopwatches)	<b>Newton's Toy Box</b> Activity 7-9 <b>Famous Scientists</b> Activity 7 <b>Matter and Change</b> Activity 1-2 <b>Plants in Our World</b> Activity 3 <b>If Shipwrecks Could Talk</b> Activity 6 <b>Earth, Moon and Sun</b> Activity 3-4	Pages 39- 54 Pages 65-75 Pages 7-21 Pages 19-24 Pages 57-68 Pages 23-35
d) Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, force (weight) to the nearest Newton, temperature to the nearest degree Celsius, time to the nearest second	<b>Newton's Toy Box</b> Activity 7-9 <b>Famous Scientists</b> Activity 7 <b>Matter and Change</b> Activity 1-2 <b>Plants in Our World</b> Activity 3 <b>Earth, Moon and Sun</b> Activity 3-4	Pages 39-54 Pages 65-75 Pages 7-21 Pages 19-24 Pages 23-35
e) Compare amounts/measurements	<b>Newton's Toy Box</b> Activity 7-9 <b>Famous Scientists</b>	Pages 39-54

	Activity 7 <b>Matter and Change</b> Activity 1-2 <b>Plants in Our World</b> Activity 3 <b>Earth, Moon and Sun</b> Activity 3-4	Pages 65-75 Pages 7-21 Pages 19-24 Pages 23-35
f) Judge whether measurements and computation of quantities are reasonable	<b>Newton's Toy Box</b> Activity 7-9 <b>Famous Scientists</b> Activity 7 <b>Matter and Change</b> Activity 1-2 <b>Plants in Our World</b> Activity 3 <b>Earth, Moon and Sun</b> Activity 3-4	Pages 39-54 Pages 65-75 Pages 7-21 Pages 19-24 Pages 23-35
g. Calculate the range and average/mean of a set of data		

**Concept C: Evidence is used to formulate explanations**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Use quantitative and qualitative data as support for reasonable explanations (conclusions)	DSM modules emphasize that students use evidence to make explanations. See for example: <b>Newton's Toy Box</b> Activity 7-9 <b>Famous Scientists</b> Activity 2, 7 <b>Plants in Our World</b> Activity 3, 5 <b>If Shipwrecks Could Talk</b> Activity 7 <b>Astronomy</b> Activity 5-6	Pages 39-54 Pages 21-28, 65-75 Pages 19-24, 31-36 Pages 69-76 Pages 43-60
b. Use data as support for observed patterns and relationships, and to make predictions to be tested	<b>Newton's Toy Box</b> Activity 7-9 <b>Famous Scientists</b> Activity 2, 7 <b>Plants in Our World</b> Activity 3 <b>Matter and Change</b> Activity 1-2 <b>Earth Processes</b> Activity 10	Pages 39-54 Pages 21-28, 65-75 Pages 19-24 Pages 7-21 Pages 77-82
c. Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions)	DSM modules provide the opportunity for the teaching of this expectation. See examples above.	

**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence - All Units</i></p> <p>a. Evaluate the reasonableness of an explanation (conclusion)</p> <p>b. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories)</p>	<p>DSM modules provide the opportunity to teach these expectations. See for example:</p> <p><b>Earth Processes</b> Activity 10-12</p> <p><b>Plants in Our World</b> Activity 3, 5-6</p> <p><b>Newton's Toy Box</b> Activity 7-10</p> <p><b>Famous Scientists</b> Activity 1-3</p> <p><b>Electrical Connections</b> Activity 8-10</p> <p><b>Matter and Change</b> Activity 11-13</p> <p><b>Earth Processes</b> Activity 10-12</p> <p><b>Plants in Our World</b> Activity 3, 5-6</p> <p><b>Newton's Toy Box</b> Activity 7-10</p> <p><b>Famous Scientists</b> Activity 1-3</p> <p><b>Electrical Connections</b> Activity 8-10</p> <p><b>Matter and Change</b> Activity 11-13</p>	<p>Pages 77-93</p> <p>Pages 19-24, 31-41</p> <p>Pages 39-58</p> <p>Pages 11-34</p> <p>Pages 53-70</p> <p>Pages 81-97</p> <p>Pages 77-93</p> <p>Pages 19-24, 31-41</p> <p>Pages 39-58</p> <p>Pages 11-34</p> <p>Pages 53-70</p> <p>Pages 81-97</p>

**Concept E: The nature of science relies upon communication of results and justification of explanations**

Grade Level Expectation	DSM	Page(s)
<p><i>Scope and Sequence - All Units</i></p> <p>a. Communicate the procedures and results of investigations and explanations through: oral presentations drawings and maps data tables (allowing for the recording and analysis of data relevant to the experiment, such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities) graphs (bar, single line, pictograph) equations and writings</p>	<p>DSM activities provide the opportunity to teach these expectations. See for example:</p> <p><b>Earth Processes</b> Activity 10</p> <p><b>Plants in Our World</b> Activity 3-6</p> <p><b>Newton's Toy Box</b> Activity 7-10</p> <p><b>Famous Scientists</b> Activity 7-8</p> <p><b>Electrical Connections</b> Activity 8-10</p> <p><b>Matter and Change</b> Activity 1-3</p>	<p>Pages 77-82</p> <p>Pages 19-41</p> <p>Pages 39-58</p> <p>Pages 65-84</p> <p>Pages 53-64</p> <p>Pages 7-28</p>

## STRAND 8

### Impact of Science, Technology and Human Activity

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs

**Concept A: Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Explain how technological improvements, such as those developed for use in space exploration, the military, or medicine, have led to the invention of new products that may improve lives here on Earth (e.g., new materials, freeze-dried foods, infrared goggles, Velcro, satellite imagery, robotics, lasers)	<b>Earth, Moon and Sun</b> Activity 6, Science, Technology and Society	Page 52
	<b>Astronomy</b> Activity 3, Science, Technology and Society	Page 34

**Concept B: Advances in technology often result in improved data collection and an increase in scientific information**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Identify the link between technological developments and the scientific discoveries made possible through their development (e.g., Hubble telescope and stellar evolution, composition and structure of the universe; the electron microscope and cell organelles; sonar and the composition of the Earth; manned and unmanned space missions and space exploration; Doppler radar and weather conditions; MRI and CAT-scans and brain activity)	<b>Astronomy</b> Activity 9	Pages 77-83
	Activity 6, Science, Technology and Society	Page 60
	Activity 9, Science, Technology and Society	Page 83

**Concept C: Technological solutions to problems often have drawbacks as well as benefits**

Grade Level Expectation	DSM	Page(s)
<i>Scope and Sequence - All Units</i>		
a. Describe how technological solutions to problems (e.g., storm water runoff, fiber optics, windmills, efficient car design, electronic trains	<b>Astronomy</b> Activity 1, Science, Technology and Society	Page 16
	Activity 6, Science, Technology and Society	Page 60

without conductors, sonar, robotics, Hubble telescope) can have both benefits and drawbacks (e.g., design constraints, unintended consequences, risks) (Assess Locally))		
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**2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time**

**Concept A: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence - All Units</i>		
a. Describe how the contributions of scientists and inventors, representing different cultures, races, and gender, have contributed to science, technology and human activity (e.g., George Washington Carver, Thomas Edison, Thomas Jefferson, Isaac Newton, Marie Curie, Galileo, Albert Einstein, Mae Jemison, Edwin Hubble, Charles Darwin, Jonas Salk, Louis Pasteur, Jane Goodall, Tom Akers, John Wesley Powell, Rachel Carson) (Assess Locally)	<b>Famous Scientists</b> Activity 1-12 <b>Earth, Moon and Sun</b> Reader <b>Newton's Toy Box</b> Reader <b>Astronomy</b> Activity 9, Science and Language Arts <b>Matter and Change</b> Reader	Pages 11-121  Page 20  Page 22  Page 83  Page 21

**Concept B: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<i>Scope and Sequence - All Units</i>		
a. Recognize the difficulty science innovators experience as they attempt to break through accepted ideas (hypotheses, laws, theories) of their time to reach conclusions that may lead to changes in those ideas and serve to advance scientific understanding (e.g., Darwin, Copernicus, Newton)	<b>Famous Scientists</b> Activity 3 <b>Earth, Moon and Sun</b> Reader	Pages 29-34  Page 20
b. Recognize explanations have changed over time	<b>Matter and Change</b> Reader	Page 22

as a result of new evidence		
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**3. Science and technology affect, and are affected by, society**

**Concept B: Social, political, economic, ethical and environmental factors strongly influence, and are influenced by, the direction of progress of science and technology**

<b>Grade Level Expectation</b>	<b>DSM</b>	<b>Page(s)</b>
<p><i>Scope and Sequence - All Units</i></p> <p>a. Describe ways in which science and society influence one another (e.g., scientific knowledge and the procedures used by scientists influence the way many individuals in society think about themselves, others, and the environment; societal challenges often inspire questions for scientific research; social priorities often influence research priorities through the availability of funding for research)</p> <p>b. Identify and evaluate the physical, social, economic, and/or environmental problems that may be overcome using science and technology (e.g., the need for alternative fuels, human travel in space, AIDS)</p>	<p><b>Earth, Moon and Sun</b> Activity 6, Science, Technology and Society</p>	<p>Page 52</p>