

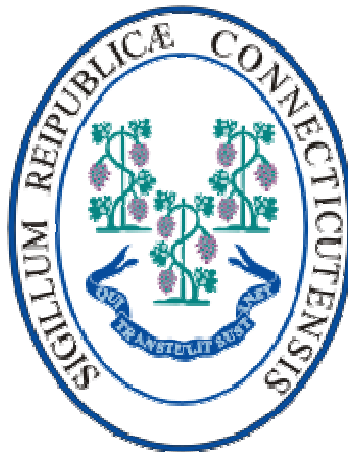


# Delta Science Modules III (DSM)

Pre-K-8

**Correlation to the**

**Connecticut  
Science  
Framework**



# Connecticut Science Framework

Correlation with Delta Science Modules III  
(DSM)

Pre K-8

**The following correlation of the Connecticut Science Framework to Delta Science Modules III is to show representative examples of investigations and activities that address listed standards as identified by Grade Level Expectations (GLEs). A citation does not reflect all of the investigations or activities that might address a particular standard or expected performance.**

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# PREKINDERGARTEN

## Properties of Matter

### PK.1 – Objects have properties that can be observed and used to describe similarities and differences.

*PK.1.a. Some properties can be observed with the senses, and others can be discovered by using simple tools or tests.*

<b>Preschool Curriculum Framework</b>	<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
<p><b>Cognitive Development: Logical-Mathematical/Scientific Thinking</b></p> <p>Ask questions about and comment on observations and experimentation.</p> <p>Collect, describe and record information.</p> <p>Use equipment for investigation.</p> <p>Use common instruments to measure things.</p> <p>Demonstrate understanding of one-to-one correspondence while counting.</p> <p>Order several objects on the basis of one attribute.</p> <p>Sort objects by one or more attributes and regroup the objects based on a new attribute.</p> <p>Engage in a scientific experiment with a peer or with a small group.</p>	<p>1. Use senses to make observations of objects and materials within the child's immediate environment.</p> <p>2. Use simple tools (e.g., balances and magnifiers) and nonstandard measurement units to observe and compare properties of objects and materials.</p> <p>3. Make comments or express curiosity about observed phenomena (e.g., "I notice that..." or "I wonder if...").</p> <p>4. Count, order and sort</p>	<p><b>How Do We Learn Properties</b> Activity 1-2</p> <p><b>Investigating Water</b> Activity 1-5</p> <p><b>Sunshine and Shadows</b> Activity 1-6</p> <p><b>Observing an Aquarium</b> Activity 3-6</p> <p><b>Finding the Moon</b> Activity 1, 4, 8</p>	<p>Pages 13-29</p> <p>Pages 13-46</p> <p>Pages 13-54</p> <p>Pages 13-18, 33-41</p> <p>Pages 31-67</p> <p>Pages 13-19, 39-46, 71-76</p>
		<p><b>How Do We Learn Properties</b> Activity 4-12</p> <p><b>From Seed to Plant</b> Activity 6-7</p> <p><b>Sunshine and Shadows</b> Activity 1-7</p> <p><b>Observing an Aquarium</b> Activity 6</p>	<p>Pages 37-101</p> <p>Pages 47-60</p> <p>Pages 13-66</p> <p>Pages 49-56</p> <p>Pages 31-78</p>
		<p><b>Properties</b> Activity 10-12</p> <p><b>Investigating Water</b> Activity 5-8</p> <p><b>Sunshine and Shadows</b> Activity 6-11</p> <p><b>Observing an Aquarium</b> Activity 7-9</p> <p><b>Finding the Moon</b> Activity 9-10</p> <p><b>From Seed to Plant</b> Activity 5-8</p>	<p>Pages 75-93</p> <p>Pages 41-69</p> <p>Pages 49-88</p> <p>Pages 69-95</p> <p>Pages 77-91</p> <p>Pages 45-72</p>

	objects (e.g., blocks, crayons, toys) based on one visible property (e.g., color, shape, size).	<b>How Do We Learn</b> Activity 2-3 <b>Properties</b> Activity 2-6, 10-12  <b>Investigating Water</b> Activity 5 <b>From Seed to Plant</b> Activity 1  <b>Investigating Water</b> Activity 8 See also grade 2 module <b>Force and Motion.</b> Activity 4-6	Pages 23-35  Pages 19-52, 75-83  Pages 41-46  Pages 15-20  Pages 63-69  Pages 41-64
	5. Conduct simple tests to determine if objects roll, slide or bounce.		

## Heredity and Evolution

### K.2 – Many different kinds of living things inhabit the earth.

*PK.2.a. Living things have certain characteristics that distinguish them from nonliving things, including growth, movement, reproduction and response to stimuli.*

Preschool Curriculum Framework	Grade-Level Expectations Students should be able to:	DSM Investigations	Page(s)
<p><b>Cognitive Development:</b> <b>Logical-Mathematical/Scientific Thinking</b></p> <p>Ask questions about and comment on observations and experimentation.</p> <p>Collect, describe and record information.</p> <p>Sort objects by one or more attributes and regroup the objects based on a new attribute.</p> <p>Compare and contrast objects and events.</p> <p><b>Personal and Social Development</b></p> <p>Identify themselves by family and gender.</p> <p>State at least two ways in which</p>	<p>1. Use the senses and simple tools to make observations of characteristics and behaviors of living and nonliving things.</p> <p>2. Give examples of living things and nonliving things.</p>	<p><b>Observing an Aquarium</b> Activity 3-10 <b>From Seed to Plant</b> Activity 3-11</p> <p>DSM provides the opportunity for teachers to address this expectation: See below: <b>How Do We Learn</b> Activity 2-3 <b>Properties</b> Activity 1-9 <b>Investigating Water</b> Activity 1-2, 9-11</p> <p><b>Observing an Aquarium</b> Activity 3-10, 12</p> <p>Reader, “<i>What is an Aquarium</i>”, “<i>What is a Fish</i>”, “<i>How Do Fish Breathe</i>”, “<i>How Do Fish Grow</i>”, “<i>Fish Need Food</i>”</p> <p><b>From Seed to Plant</b> Activity 1, 4, 8</p> <p>Reader, “<i>What is a Seed</i>”, “<i>How Do Seeds Grow</i>”, “<i>What are the Parts of a Plant</i>”, “<i>What is a Plant Life Cycle</i>”,</p>	<p>Pages 31-107</p> <p>Pages 33-90</p> <p>Pages 23-35</p> <p>Pages 13-73</p> <p>Pages 13-26, 71-94</p> <p>Pages 31-107, 117-125</p> <p>Pages 2-11</p> <p>Pages 15-20, 39-43, 67-72</p> <p>Pages 2-11</p>

children are similar and two ways in which they are different.	3. Make observations and distinguish between the characteristics of plants and animals.	<p><i>“What Do Plants Need to Grow”</i></p> <p><b>Observing an Aquarium</b> Activity 3-10, 12</p> <p>Reader, <i>“What is an Aquarium”, “What is a Fish”, “How Do Fish Breathe”, “How Do Fish Grow”, “Fish Need Food”</i></p> <p><b>From Seed to Plant</b> Activity 1-13 Reader, <i>“What is a Seed”, “How Do Seeds Grow”, “What are the Parts of a Plant”, “What is a Plant Life Cycle”, “What Do Plants Need to Grow”</i></p>	<p>Pages 31-107, 117-125 Pages 2-11</p> <p>Pages 13-103 Pages 2-11</p>
	4. Compare attributes of self, family members or classmates, and describe how they are similar and different.		
	5. Describe the similarities and differences in the appearance and behaviors of plants, birds, fish, insects and mammals (including humans).	<p>DSM provides the opportunity for teachers to address this expectation: See below:</p> <p><b>Observing an Aquarium</b> Activity 3-10, 12</p> <p>Reader, <i>“What is an Aquarium”, “What is a Fish”, “How Do Fish Breathe”, “How Do Fish Grow”, “Fish Need Food”</i></p> <p><b>From Seed to Plant</b> Activity 1-13 Reader, <i>“What is a Seed”, “How Do Seeds Grow”, “What are the Parts of a Plant”, “What is a Plant Life Cycle”, “What Do Plants Need to Grow”</i></p>	<p>Pages 31-107, 117-125 Pages 2-11</p> <p>Pages 13-103 Pages 2-11</p>

## Energy in the Earth’s Systems

### PK.3 – Weather conditions vary daily and seasonally.

*PK.3.a. Daily and seasonal weather conditions affect what we do, what we wear and how we feel.*

<b>Preschool Curriculum Framework</b>	<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
<b>Cognitive Development: Logical-Mathematical/Scientific Thinking</b>	1. Use the senses to observe and describe evidence of current or recent weather conditions (e.g., flags blowing, frost on window, puddles after	This expectation is addressed in the grade 2 module <b>Weather Watching.</b> Activity 1-7	Pages 13-68

	rain, etc.).		
Ask questions about and comment on observations and experimentation.	2. Notice weather conditions and use words and numbers to describe and analyze conditions over time (e.g., “it rained five times this month”).	This expectation is addressed in the grade 2 module <b>Weather Watching</b> . Activity 1-7	Pages 13-68
Collect, describe and record information.  Demonstrate an understanding of sequence of events and time periods.  Make and verify predictions about what will occur.  <b>Personal and Social Development</b>  Use self-help skills	3. Identify the season that corresponds with observable conditions (e.g., falling leaves, snow vs. rain, buds on trees or greener grass).  4. Make judgments about appropriate clothing and activities based on weather conditions.	This expectation is addressed in the grade 2 module <b>Weather Watching</b> . Reader, “ <i>Weather and the Seasons</i> ”, “ <i>Why Do We Have Seasons</i> ”  This expectation is addressed in the grade 2 module <b>Weather Watching</b> . Activity 1 Reader, “ <i>Watching the Weather</i> ”	Pages 8-10  Pages 13-19 Page 2

### Science and Technology in Society

**PK.4 – Some objects are natural, while others have been designed and made by people to improve the quality of life.**

*PK.4.a Humans select materials with which to build structures based on the properties of the materials.*

<b>Preschool Curriculum Framework</b>	<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
<b>Cognitive Development: Logical-Mathematical/Scientific Thinking</b>  Ask questions about and comment on observations and experimentation.  Sort objects by one or more attributes and regroup the objects based on a new attribute.  Make and verify predictions about what will occur.  Engage in a scientific	1. Observe, describe and sort building materials by properties such as strength, weight, stiffness or flexibility.  2. Pose questions and conduct simple tests to compare the effectiveness of different building materials (e.g., blocks of wood, plastic, foam or cardboard) for constructing towers, bridges and buildings.		

<p>experiment with a peer or with a small group.</p> <p><b>Personal and Social Development</b></p> <p>Demonstrate the ability to use a minimum of two different strategies to attempt to solve a problem.</p> <p><b>Creative Expression/Aesthetic Development</b></p> <p>Use a variety of art materials and activities for sensory experience and exploration.</p>	<p>3. Make judgments about the best building materials to use for different purposes (e.g., making the tallest tower or the longest bridge).</p> <p>4. Invent and explain techniques for stabilizing a structure.</p> <p>5. Compare block structures to pictures and to real structures in the neighborhood.</p>		
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# KINDERGARTEN

## Properties of Matter

### K.1 – Objects have properties that can be observed and used to describe similarities and differences.

*K.1.a. Some properties can be observed with the senses, and others can be discovered by using simple tools or tests.*

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Match each of the five senses with its associated body part and the kind of information it perceives.	<b>How Do We Learn</b> Activity 1 Reader, “ <i>We Use Our Senses</i> ” <b>Properties</b> Activity 3-6 Reader, “ <i>What is a Solid</i> ” <b>Investigating Water</b> Activity 1-6 <b>Finding the Moon</b> Activity 8 <b>Observing an Aquarium</b> Activity 3-6	Pages 13-22 Pages 2-6  Pages 25-56 Page 7  Pages 13-54  Pages 71-76  Pages 31-67
2. Make scientific observations using the five senses, and distinguish between an object’s observable properties and its name or its uses.	<b>How Do We Learn</b> Activity 1-3 <b>Properties</b> Activity 1-5 <b>Investigating Water</b> Activity 1-6 <b>Finding the Moon</b> Activity 1, 4, 8  <b>Observing an Aquarium</b> Activity 3-6 <b>From Seed to Plant</b> Activity 1, 3	Pages 13-25  Pages 13-46  Pages 13-54  Pages 13-19, 39-46, 71-76  Pages 31-67  Pages 15-20, 33-38
3. Classify organisms or objects by one and two observable properties and explain the rule used for sorting (e.g., size, color, shape, texture or flexibility).	<b>How Do We Learn</b> Activity 2-3 <b>Properties</b> Activity 3-6, 10-11 <b>Investigating Water</b> Activity 5 <b>From Seed to Plant</b> Activity 1	Pages 23-35  Pages 25-52, 75-86  Pages 41-46  Pages 15-20
4. Use simple tools and nonstandard units to estimate or predict properties such as size, heaviness, magnetic attraction and float/sink.	<b>How Do We Learn</b> Activity 6-11 <b>Properties</b> Activity 6-7, 10-11 <b>Investigating Water</b> Activity 5 <b>Sunshine and Shadows</b> Activity 6 <b>From Seed to Plant</b> Activity 1	Pages 51-93  Pages 47-60, 75-86  Pages 41-46  Pages 49-56  Pages 15-20
5. Describe properties of	<b>Properties</b>	

materials such as wood, plastic, metal, cloth or paper and sort objects by the material from which they are made.	Activity 12	Pages 87-93
6. Count, order and sort objects by their observable properties	<b>How Do We Learn</b> Activity 2-3 <b>Properties</b> Activity 2-6, 10-12 <b>Investigating Water</b> Activity 5 <b>From Seed to Plant</b> Activity 1	Pages 23-35 Pages 19-52, 75-83 Pages 41-46 Pages 15-20

## Heredity and Evolution

### K.2 – Many different kinds of living things inhabit the Earth.

*K.2.a. Living things have certain characteristics that distinguish them from nonliving things, including growth, movement, reproduction and response to stimuli.*

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Observe and describe differences between living and nonliving things in terms of growth, offspring and need for energy from “food.”	DSM provides the opportunity to address this expectation. See below; <b>How Do We Learn</b> Activity 2-3 <b>Properties</b> Activity 1-9 <b>Investigating Water</b> Activity 1-2, 9-11 <b>Observing an Aquarium</b> Activity 3-10, 12 Reader, “ <i>What is an Aquarium</i> ”, “ <i>What is a Fish</i> ”, “ <i>How Do Fish Breathe</i> ”, “ <i>How Do Fish Grow</i> ”, “ <i>Fish Need Food</i> ” <b>From Seed to Plant</b> Activity 1, 4, 8  Reader, “ <i>What is a Seed</i> ”, “ <i>How Do Seeds Grow</i> ”, “ <i>What are the Parts of a Plant</i> ”, “ <i>What is a Plant Life Cycle</i> ”, “ <i>What Do Plants Need to Grow</i> ”	Pages 23-35 Pages 13-73 Pages 13-26, 71-94 Pages 31-107, 117-125 Pages 2-11  Pages 15-20, 39-43, 67-72 Pages 2-11
2. Sort and count living and nonliving things in the classroom, the schoolyard and in pictures.	<b>Observing an Aquarium</b> Activity 12	Pages 117-125
3. Use nonstandard measures to estimate and compare the height, length or weigh of different kinds of animals.		

<p>4. Observe and write, speak or draw about similarities and differences between plants and animals.</p>	<p>DSM provides the opportunity for teachers to address this expectation: See below:  <b>Observing an Aquarium</b>            Activity 3-10, 12            Reader, “<i>What is an Aquarium</i>”, “<i>What is a Fish</i>”, “<i>How Do Fish Breathe</i>”, “<i>How Do Fish Grow</i>”, “<i>Fish Need Food</i>”  <b>From Seed to Plant</b>            Activity 1-13            Reader, “<i>What is a Seed</i>”, “<i>How Do Seeds Grow</i>”, “<i>What are the Parts of a Plant</i>”, “<i>What is a Plant Life Cycle</i>”, “<i>What Do Plants Need to Grow</i>”</p>	<p>Pages 31-107, 117-125            Pages 2-11             Pages 13-103            Pages 2-11</p>
<p>5. Match pictures or models of adults with their offspring (animals and plants).</p>	<p><b>Observing an Aquarium</b>            Activity 10            Reader, “<i>How Do Fish Grow</i>”  <b>From Seed to Plant</b>            Activity 3-5            Reader, “<i>What is a Plant Life Cycle</i>”</p>	<p>Pages 87-107            Pages 10-11             Pages 33-52            Pages 10-11</p>
<p>6. Recognize varied individuals as examples of the same kind of living thing (e.g., different color rabbits are all rabbits; different breeds of dogs are all dogs).</p>	<p>DSM provides the opportunity for teachers to address this expectation: See below:  <b>Observing an Aquarium</b>            Activity 3-5  <b>From Seed to Plant</b>            Activity 2, 5</p>	<p>Pages 31-55             Pages 21-31, 45-52</p>

## Energy in the Earth’s Systems

### K.3 – Weather conditions vary daily and seasonally.

*K.3.a Daily and seasonal weather conditions affect what we do, what we wear and how we feel.*

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
<p>1. Use the senses to observe daily weather conditions and record data systematically using organizers such as tables, charts, picture graphs or calendars.</p>	<p>This expectation is addressed in the grade 2 module  <b>Weather Watching.</b>            Activity 2-7</p>	<p>Pages 21-68</p>
<p>2. Analyze weather data collected over time (during the day, from day to day, and from season to season) to identify patterns and make comparisons and predictions.</p>	<p>This expectation is addressed in the grade 2 module  <b>Weather Watching.</b>            Activity 3-5</p>	<p>Pages 29-50</p>
<p>3. Observe, compare and contrast cloud shapes, sizes and colors, and relate the</p>	<p>This expectation is addressed in the grade 2 module  <b>Weather Watching.</b></p>	<p>Pages 51-59</p>

<p>appearance of clouds to fair weather or precipitation.</p> <p>4. Write, speak or draw ways that weather influences humans, other animals and plants.</p> <p>5. Make judgments about appropriate clothing and activities based on weather conditions.</p>	<p>Activity 6</p> <p>This expectation is addressed in the grade 2 module <b>Weather Watching.</b> Activity 1, 8-10 <i>Reader, "Watching the Weather", "Stormy Weather"</i></p> <p>This expectation is addressed in the grade 2 module <b>Weather Watching.</b> Activity 1 <i>Reader, "Watching the Weather"</i></p>	<p>Pages 13-19, 69-100 Pages 2-3, 11-12</p> <p>Pages 13-19 Pages 2-3</p>
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### Science and Technology in Society

**K.4 – Some objects are natural, while others have been designed and made by people to improve the quality of life.**

*K.4.a Daily and seasonal weather conditions affect what we do, what we wear and how we feel.*

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
<p>1. Conduct simple tests to compare the properties of different materials and their usefulness for making roofs, window, walls or floors (e.g., waterproof, transparent, strong).</p> <p>2. Seek information in books, magazines and pictures that describes materials used to build shelters by people in different regions of the world.</p> <p>3. Compare and contrast the materials used by humans and animals to build shelters.</p>		

# GRADE ONE

## Forces and Motion

### 1.1– The sun appears to move across the sky in the same way every day, but its path changes gradually over the seasons.

1.1.a An object's position can be described by locating it relative to another object or the background.

1.1.b An object's motion can be described by tracing and measuring its position over time.

Grade-Level Expectations Students should be able to:	DSM Investigations	Page(s)
1. Compare and contrast the relative positions of objects using words (in front of, behind, next to, inside of, above or below) and numbers (by measuring its distance from another object).	<b>How Do We Learn</b> Activity 6-8 <b>Properties</b> Activity 10 <b>Investigating Water</b> Activity 5, 8 <b>Sunshine and Shadows</b> Activity 1-9 Reader, "How Do Shadows Change" <b>From Seed to Plant</b> Activity 13 <b>Finding the Moon</b> Activity 2	Pages 51-71  Pages 75-80  Pages 41-46, 63-69  Pages 13-76 Pages 8-9  Pages 33-38  Pages 21-28
2. Apply direct and indirect pushes and pulls to cause objects to move (change position) in different ways (e.g., straight line, forward and backward, zigzag, in a circle).	<b>Properties</b> Activity 10-11 <b>Investigating Water</b> Activity 5, 8	Pages 75-86  Pages 41-46, 63-69
3. Classify objects by the way they move (e.g., spinning, rolling, bouncing).		
4. Conduct simple experiments and evaluate different ways to change the speed and direction of an object's motion.	<b>Investigating Water</b> Activity 8	Pages 63-69
5. Observe, record and predict the sun's position at different times of the day (morning, noon, afternoon or night).	<b>Sunshine and Shadows</b> Activity 6-7 Reader, "How Do Shadows Change" <b>Finding the Moon</b> Activity 5	Pages 49-63 Pages 8-9  Pages 47-54
6. Conduct simple investigations of shadows and analyze how shadows change as the relative position of the sun (or an artificial light source) changes).	<b>Sunshine and Shadows</b> Activity 6-11	Pages 49-88

## Structure and Function

### 1.2 – Living things have different structures and behaviors that allow them to meet their basic needs.

1.2.a. *Animals need air, water and food to survive.*

1.2.b. *Plants need air, water and sunlight to survive.*

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
<p>1. Infer from direct observation and print or electronic information that most animals and plants need water, food and air to stay alive.</p> <p>2. Identify structures and behaviors used by mammals, birds, amphibians, reptiles, fish and insects to move around, breathe and obtain food and water (e.g., legs/wings/fins, gills/lungs, claws/fingers, etc.)</p> <p>3. Sort and classify plants (or plant parts) by observable characteristics (e.g., leaf shape/size, stem or trunk covering, flower or fruit).</p> <p>4. Use senses and simple measuring tools to measure the effects of water and sunlight on plant growth.</p> <p>5. Compare and contrast information about animals and plants found in fiction and nonfiction sources.</p>	<p><b>Observing an Aquarium</b> Activity 2 Reader, “<i>How Fish Breathe</i>”, “<i>Fish Need Food</i>”</p> <p><b>From Seed to Plant</b> Activity 2. 8, 14  Reader, “<i>What is a Seed</i>”, “<i>What are the Parts of a Plant</i>”</p>	<p>Pages 23-30 Pages 8-9, 12</p> <p>Pages 21-31, 67-72, 105-109 Pages 3-8, 12</p>
	<p><b>Observing an Aquarium</b> Activity 4-6, 8-9 Reader, “<i>What is a Fish</i>”, “<i>How do Fish Breathe</i>”</p>	<p>Pages 39-67, 79-95 Pages 6-9</p>
	<p><b>From Seed to Plant</b> Activity 10, 12</p>	<p>Pages 79-84, 91-96</p>
	<p><b>From Seed to Plant</b> Activity 8, 11</p>	<p>Pages 67-72, 85-90</p>
	<p><b>Observing an Aquarium</b> Activity 4, Science and Language Arts Activity 5, Science and Language Arts Reader, “<i>What is an Aquarium</i>”, “<i>What is a Fish</i>”, “<i>How Do Fish Breathe</i>”, “<i>How Do Fish Grow</i>”, “<i>Fish Need Food</i>”</p>	<p>Page 46  Page 55 Pages 2-12</p>

## Structure and Function

### 1.3 – Organisms change their form and behavior as part of their life cycles.

1.3.a. Some organisms undergo metamorphosis during their life cycles; other organisms grow and change, but their basic form stays essentially the same.

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Explain that living things experience a life cycle during which they undergo a predictable sequence of changes from birth, growth, reproduction and death.	<b>Observing an Aquarium</b> Activity 10 Activity 10, Science Challenge Reader, “ <i>How Do Fish Grow</i> ” <b>From Seed to Plant</b> Activity 13 Reader, “ <i>What is a Plant Life Cycle</i> ”	Pages 97-107 Page 107 Pages 10-11  Pages 97-103 Pages 10-11
2. Distinguish between animals that are born alive (e.g., humans, dogs, cows) and those that hatch from eggs (e.g., chickens, sea turtles, crocodiles).	<b>Observing an Aquarium</b> Activity 10 Activity 10, Science Challenge Reader, “ <i>How Do Fish Grow</i> ”	Pages 97-107 Page 107 Pages 10-11
3. Compare and contrast the changes in structure and behavior that occur during the life cycles of animals that undergo metamorphosis with those that do not.	<b>Observing an Aquarium</b> Activity 10 Activity 10, Science Challenge Reader, “ <i>How Do Fish Grow</i> ” See also grade 2 module <b>Butterflies and Moths</b> Activity 1-2, 6, 9, 11  Reader, “ <i>Life Cycle of Butterflies and Moths</i> ” “ <i>Other Insect Life Cycles</i> ”	Pages 97-107 Page 107 Pages 10-11  Pages 15-30, 53-59, 79-87, 97-104 Pages 8-13
4. Analyze recorded observations to compare the metamorphosis stages of different animals, and make predictions based on observed patterns.	<b>Observing an Aquarium</b> Activity 10 Activity 10, Science Challenge Reader, “ <i>How Do Fish Grow</i> ” See also grade 2 module <b>Butterflies and Moths</b> Activity 1-2, 6, 9, 11	Pages 97-107 Page 107 Pages 10-11  Pages 15-30, 53-59, 79-87, 97-104

## Science and Technology in Society

### 1.4 – The properties of materials and organisms can be described more accurately through the use of standard measuring units.

1.4.a. Various tools can be used to measure, describe and compare different objects and organisms.

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Use nonstandard and standard measurements to describe and compare the weight, length and size of	<b>How Do We Learn</b> Activity 6-11 <b>Properties</b> Activity 6 Activity 6, Science and Math	Pages 51-93  Pages 47-52 Page 52

<p>objects and organisms.</p> <p>2. Show approximate size of a centimeter, meter, inch, foot and yard using referents such as a finger, a hand or a book.</p> <p>3. Select appropriate tools for measuring length, height, weight or liquid volume.</p> <p>4. Use metric and customary rulers to measure length, height or distance in centimeters, meters, inches, feet and yards.</p> <p>5. Use balances and scales to compare and measure the heaviness of objects and organisms in kilograms, grams, pounds and ounces.</p> <p>6. Use graduated cylinders, beakers and measuring cups to measure the volume of liquids in milliliters, liters, cups and ounces.</p> <p>7. Use thermometers to measure air and water temperature in degrees Celsius and degrees Fahrenheit.</p> <p>8. Make graphs to identify patterns in recorded measurements such as growth or temperature over time</p>	<p>Activity 9, Science and Math <b>Investigating Water</b> Activity 10, Science and Math <b>From Seed to Plant</b> Activity 7</p> <p><b>How Do We Learn</b> Activity 11-12</p> <p><b>How Do We Learn</b> Activity 6-12 <b>Properties</b> Activity 6, Science and Math Activity 9, Science and Math <b>Sunshine and Shadows</b> Activity 8, Science and Math Activity 9, Science and Math</p> <p><b>How Do We Learn</b> Activity 10-11 <b>Investigating Water</b> Activity 2, Science and Math <b>Sunshine and Shadows</b> Activity 8, Science and Math</p> <p><b>How Do We Learn</b> Activity 12</p> <p><b>How Do We Learn</b> Activity 12 <b>Sunshine and Shadows</b> Activity 3, Science and Math</p> <p><b>How Do We Learn</b> Activity 7, Science and Math <b>From Seed to Plant</b> Activity 7 <b>Investigating Water</b> Activity 9, Science and Math</p>	<p>Page 73</p> <p>Page 88</p> <p>Pages 59-66</p> <p>Pages 87-101</p> <p>Pages 51-101</p> <p>Page 52 Page 73</p> <p>Page 70 Page 76</p> <p>Pages 81-92</p> <p>Page 26</p> <p>Page 70</p> <p>Pages 87-101</p> <p>Pages 87-101</p> <p>Page 32</p> <p>Page 64</p> <p>Pages 59-66</p> <p>Page 80</p>
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# GRADE TWO

## Properties of Matter

### 2.1 Materials can be classified as solid, liquid or gas based on their observable properties.

2.1.a. Solids tend to maintain their own shapes, while liquids tend to assume the shapes of their containers and gases fill their containers fully.

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Compare and contrast the properties that distinguish solids, liquids and gases.	<b>States of Matter</b> Activity 1-3 Reader, "What is Matter", "What are Solids, Liquids, and Gases" <b>Sink or Float</b> Reader, "What is a Solid", "What is a Liquid", "A Gas can Float"	Pages 13-27 Pages 3-6  Pages 5-6, 15
2. Classify objects and materials according to their state of matter.	<b>States of Matter</b> Reader, "What is Matter", "What are Solids, Liquids, and Gases"	Pages 3-6
3. Measure and compare the sizes of different solids.	<b>States of Matter</b> Activity 1 Activity 1, Reinforcement	Pages 13-18 Page 17
4. Measure and compare the volume of a liquid poured into different containers.	<b>States of Matter</b> Activity 2 Activity 2, Reinforcement	Pages 19-25 Page 24
5. Design a fair test to compare the flow rates of different liquids and granular solids.		

## Structure and Function

### 2.2 – Plants change their form as part of their life cycles.

2.2.a. The life cycles of flowering plants include seed germination, growth, flowering, pollination and seed dispersal.

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Use senses and simple tools to observe and describe the roots, stems, leaves, flowers and seeds of various plants (including trees, vegetables and grass.)	<b>Classroom Plants</b> Activity 6-9 Reader, "What are the Parts of Plants"	Pages 55-86 Pages 6-12
2. Use magnifiers to observe and diagram the parts of a flower.	<b>Classroom Plants</b> Activity 9 Reader, "Flowers"	Pages 81-86 Page 10

<p>3. Describe the functions of roots, stems, leaves, flowers and seeds in completing a plant's life cycle.</p>	<p><b>Classroom Plants</b> Activity 6-9 Reader, <i>"What are the Parts of Plants"</i></p>	<p>Pages 55-86 Pages 6-12</p>
<p>4. Record observations and make conclusions about the sequence of stages in a flowering plant's life cycle.</p>	<p><b>Classroom Plants</b> Activity 9, Science and Language Arts</p>	<p>Page 86</p>
<p>5. Compare and contrast how seeds of different plants are adapted for dispersal by water, wind or animals.</p>		
<p>6. Conduct a fair test to explore factors that affect seed germination and plant growth.</p>	<p><b>Classroom Plants</b> Activity 3-4 Activity 3, Science Challenge Activity 4, Science Extension</p>	<p>Pages 37-46 Page 37 Page 46</p>

## The Changing Earth

### 2.3 – Earth materials have varied physical properties which make them useful in different ways.

2.3.a. Soils can be described by their, color, texture and capacity to retain water.

2.3.b. Soils support the growth of many kinds of plants, including those in our food supply

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
<p>1. Use senses and simple tools (e.g., sieves and beakers) to separate soil into components such as rock fragments, water, air and plant remains.</p>	<p><b>Soil Science</b> Activity 1-3</p>	<p>Pages 15-35</p>
<p>2. Classify soils by properties such as color, particle size (sand, silt or clay), or amount of organic material (loam).</p>	<p><b>Soil Science</b> Activity 3-4, 7 Reader, <i>"How are Soils Different"</i></p>	<p>Pages 29-44, 59-67 Pages 7-8</p>
<p>3. Explain the importance of soil to plants, animals and people.</p>	<p><b>Soil Science</b> Activity 10, 12 Activity 10, Science and Careers Activity 12, Science, Technology and Society</p>	<p>Pages 91-07, 107-114 Page 97 Page 114</p>
<p>4. Evaluate the quality of different soils in terms of observable presence of air, water, living things and plant</p>	<p><b>Soil Science</b> Activity 7 Activity 7, Science Extension Reader, <i>"How are Soils Different"</i></p>	<p>Pages 59-67 Page 67 Pages 7-8</p>

remains.		
5. Conduct fair tests to investigate how different soil types affect plant growth, and write conclusions supported by evidence.	<b>Soil Science</b> Activity 8	Pages 69-79

## Science and Technology in Society

### 2.4 – Human beings, like all other living things, have special nutritional needs for survival.

2.4.a. *The essential components of balanced nutrition can be obtained from plant and animal sources.*

2.4.b. *People eat different foods in order to satisfy nutritional needs for carbohydrates, proteins and fats.*

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Explain that food is a source of carbohydrates, proteins and fats — nutrients that animals (including humans) convert to energy they use to stay alive and grow.	This expectation is addressed in the grade 5 module <b>You and Your Body</b> . Activity 9-12	Pages 67-84
2. Classify foods into groups based on their source, and relate common foods to the plant or animal from which they come.	This expectation is addressed in the grade 5 module <b>You and Your Body</b> Activity 12	Pages 85-89
3. Give examples of ways people can improve soil quality and crop growth (e.g., irrigation, fertilizer, pest control).	<b>Soil Science</b> Activity 9 Activity 8, Science , Technology and Society Activity 10, Science and Careers Reader, “ <i>Soil is a Resource</i> ”	Pages 81-89 Page 79 Page 97 Pages 10-12
4. Compare and contrast how different cultures meet needs for basic nutrients by consuming various foods.		
5. Evaluate the nutritional value of different foods by analyzing package labels.	This expectation is addressed in the grade 5 module <b>You and Your Body</b> Activity 12	Pages 85-89

# GRADE THREE

## Properties of Matter

### 3.1 – Materials have properties that can be identified and described through the use of simple tests.

#### 3.1.a Heating and cooling cause changes in some of the properties of materials.

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
<p>1. Compare and contrast the properties of solids, liquids and gases.</p> <p>2. Demonstrate that solids, liquids and gases are all forms of matter that take up space and have weight.</p> <p>3. Carry out simple tests to determine if materials dissolve, sink or float in water; conduct heat; or attract to magnets.</p> <p>4. Classify materials based on their observable properties, including state of matter.</p> <p>5. Design and conduct fair tests to investigate the absorbency of different materials, write conclusions based on evidence, and analyze why similar investigations might produce different results.</p>	<p><b>States of Matter</b> Activity 1-3 Reader, “<i>What is Matter</i>”, “<i>What are Solids, Liquids, and Gases</i>”</p> <p><b>Sink or Float</b> Reader, “<i>What is a Solid</i>”, “<i>What is a Liquid</i>”, “<i>A Gas can Float</i>”</p> <p><b>States of Matter</b> Activity 1-3 Reader, “<i>What is Matter</i>”, “<i>What are Solids, Liquids, and Gases</i>”</p> <p><b>States of Matter</b> Activity 12</p> <p><b>Sink or Float</b> Activity 1-12</p> <p><b>Magnets</b> Activity 1-2</p> <p><b>Water Cycle</b> Activity 1, Science Extension</p> <p><b>States of Matter</b> Activity 1-3 Reader, “<i>What are Solids, Liquids, and Gases</i>”</p> <p><b>Soil Science</b> Activity 7 Reader, “<i>How are Soils Different</i>”</p> <p><b>Magnets</b> Activity 2</p> <p><b>Sink or Float</b> Activity 1</p> <p><b>Electrical Circuits</b> Activity 6-7</p>	<p>Pages 13-27 Pages 3-6</p> <p>Pages 5-6, 15</p> <p>Pages 13-27 Pages 2-6</p> <p>Pages 97-101</p> <p>Pages 13-107</p> <p>Pages 13-23</p> <p>Pages 21</p> <p>Pages 13-27 Pages 4-6</p> <p>Pages 59-67 Pages 7-8</p> <p>Pages 19-23</p> <p>Pages 13-19</p> <p>Pages 51-62</p>

6. Explain the role of heating and cooling in changing matter from one state to another during freezing, melting, evaporation and condensation.	<b>States of Matter</b> Activity 4-5, 7-12 Reader, “ <i>What are Physical Changes</i> ” <b>Water Cycle</b> Activity 4-5, 8-9,11-13  Reader, “ <i>How Water Changes Form</i> ”, “ <i>What is the Water Cycle</i> ”	Pages 35-50, 57-101 Pages 8-10  Pages 39-51, 69-83, 91-114 Pages 8-12
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## Matter and Energy in Ecosystems

### 3.2 – Organisms can survive and reproduce only in environments that meet their basic needs.

3.2.a. *Plants and animals have structures and behaviors that help them survive in different environments.*

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
<p>1. Compare and contrast the external features and behaviors that enable different animals and plants (including those that are extinct) to get food, water and sunlight; find mates; and be protected in specific land and water habitats.</p> <p>2. Explain how behaviors such as hibernation, dormancy and migration give species advantages for surviving unfavorable environmental conditions.</p>	<b>Butterflies and Moths</b> Activity 7-8, 10 Reader, “ <i>What is an Insect</i> ” <b>Classroom Plants</b> Activity 10-11 Reader, “ <i>What is a Plant</i> ”, “ <i>What are the Parts of a Plant</i> ” <b>Plant and Animal Populations</b> Activity 4-7, 10-11 Reader, “ <i>What do Plants Need</i> ”, “ <i>What do Animals Need</i> ”, “ <i>What are Predators and Prey</i> ” <b>Dinosaurs and Fossils</b> Activity 8 Reader, “ <i>What Were Dinosaurs Like</i> ” <b>Food Chains and Webs</b> Activity 4-7 Reader, “ <i>Living Things Interact</i> ” <b>Plant and Animal Life Cycles</b> Activity 8 Reader, “ <i>About Emperor Penguins</i> ”  <b>Butterflies and Moths</b> Activity 11, Science and Social Studies Reader, “ <i>About Migration</i> ” <b>Plant and Animal Populations</b> Reader, “ <i>What do Animals Need</i> ” <b>Food Chains and Webs</b> Activity 7	<p>Pages 61-71, 89-96 Pages 4-5</p> <p>Pages 87-101 Pages 3, 6-12</p> <p>Pages 43-76, 95-110 Pages 5-7, 11</p> <p>Pages 61-66 Pages 6-11</p> <p>Pages 39-66 Pages 4-5</p> <p>Pages 75-82 Page 15</p> <p>Page 104 Page 15</p> <p>Page 7</p> <p>Pages 59-66</p>

3. Give examples of ways animals benefit from camouflage.	<b>Butterflies and Moths</b> Activity 3, 8 <b>Food Chains and Webs</b> Activity 7	Pages 31-38, 71-77  Pages 59-66
4. Evaluate whether an adaptation gives a plant or animal a survival advantage in a given environment.	DSM provides the opportunity to address this expectation, See below: <b>Butterflies and Moths</b> Activity 3, 8, 10 <b>Food Chains and Webs</b> Activity 7 Reader, “ <i>Living Things Interact</i> ”	Pages 31-38, 71-77, 89-96  Pages 59-66 Page 5
5. Design a model of an organism whose adaptations give it an advantage in a specific environment.	<b>Butterflies and Moths</b> Activity 3, 8	Pages 31-38, 71-77

## The Changing Earth

### 3.3 – Earth materials have different physical and chemical properties.

*3.3.a. Rocks and minerals have properties that may be identified through observation and testing; these properties determine how earth materials are used.*

<b>Grade-Level Expectations</b> <i>Students should be able to:</i>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Differentiate between rocks and minerals.	This expectation is addressed in the grade 5 module <b>Rocks and Minerals.</b> Activity 1 Reader, “ <i>What are Minerals</i> ”, “ <i>What are Rocks</i> ”	Pages 13-19 Pages 2, 9
2. Use the senses and simple measuring tools to gather data about various rocks and classify them based on observable properties (e.g., shape, size, color, weight, visible markings).	This expectation is addressed in the grade 5 module <b>Rocks and Minerals.</b> Activity 2, 9-10	Pages 21-27, 69-84
3. Conduct simple tests to determine properties of different minerals (e.g., color, odor, streak, luster, hardness, magnetism), organize data in a table, and use the data and other resources to identify unknown mineral specimens.	This expectation is addressed in the grade 5 module <b>Rocks and Minerals.</b> Activity 3-6 Reader, “ <i>What are Minerals</i> ”	Pages 29-54 Pages 2-6
4. Summarize nonfiction text to compare and contrast the conditions under which igneous, metamorphic and	<b>Earth Movements</b> Reader, “ <i>About the Rock Cycle</i> ” This expectation is	Page 15

sedimentary rocks are formed.	addressed in the grade 5 module <b>Rocks and Minerals</b> . Reader, “ <i>What are Rocks</i> ”	Pages 9-12
5. Observe and analyze rock properties (e.g., crystal size or layers) to infer the conditions under which the rock was formed.	This expectation is addressed in the grade 5 module <b>Rocks and Minerals</b> . Activity 9-10 Reader, “ <i>What are Rocks</i> ”	Pages 69-84 Pages 9-12
6. Evaluate the usefulness of different rock types for specific applications (e.g., buildings, sidewalks, stone walls, statues or monuments).	This expectation is addressed in the grade 5 module <b>Rocks and Minerals</b> . Activity 11 Reader, “ <i>What are Rocks</i> ”	Pages 85-92 Pages 9-12

### Science and Technology in Society

#### 3.4 – Earth materials provide resources for all living things, but these resources are limited and should be conserved.

##### 3.4.a Decisions made by individuals can impact the global supply of many resources.

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Describe ways people use earth materials, such as fossil fuels, trees, water, soils and rocks as natural resources to improve their lives.	<b>Soil Science</b> Reader, “ <i>Soil is a Resource</i> ” <b>Water Cycle</b> Activity 8, Science, Technology and Society Reader, “ <i>Water is a Resource</i> ” <b>Electrical Circuits</b> Reader, “ <i>About Water Power</i> ”	Pages 10-11  Page 76 Pages 14-15  Pages 14-15
2. Summarize nonfiction text to explain how humans use technology to access and use natural resources to produce electricity or other products (e.g., paper or concrete).	<b>Water Cycle</b> Activity 3, Science, Technology and Society Reader, “ <i>Water is a Resource</i> ” <b>Electrical Circuits</b> Reader, “ <i>About Water Power</i> ”, “ <i>About Using Energy at Home</i> ”	  Page 37 Pages 14-15  Pages 14-15
3. Explain advantages and disadvantages of renewable and nonrenewable energy sources that can be used for making electricity, fueling cars or heating homes.	<b>Electrical Circuits</b> Reader, “ <i>About Water Power</i> ”, “ <i>About Using Energy at Home</i> ”	Pages 14-15
4. Design and conduct experiments to evaluate the effectiveness of different insulating materials for keeping a substance warm or cold (i.e., conducting heat).	<b>States of Matter</b> Activity 5 Activity 5, Science Challenge	Pages 41-50 Page 50

<p>5. Use mathematics to estimate, measure and graph the quantity of a natural resource (e.g., water, paper) used by an individual (or group) in a certain time period.</p>	<p><b>Water Cycle</b> Activity 11, Science and Math Activity 11, Science, Technology and Society</p>	<p>Page 98  Page 98</p>
<p>6. Distinguish among reducing, reusing, recycling and replacing as conservation techniques.</p>	<p>This expectation is addressed in the grade 5 module <b>Pollution.</b> Activity 2-3 Reader, "<i>Land Pollution</i>"</p>	<p>Pages 19-30 Page 3</p>

# GRADE FOUR

## Forces and Motion

### 4.1 – The position and motion of objects can be changed by pushing and pulling.

4.1.a. The size of the change in an object's motion is related to the strength of the push or pull.

4.1.b. The more massive an object is, the less effect a given force will have on its motion.

Grade-Level Expectations Students should be able to:	DSM Investigations	Page(s)
<p>1. Demonstrate that a force can cause an object to start moving, stop, or change speed or direction.</p>	<p>This expectation is addressed in the grade 3 module <b>Force and Motion</b> and the grade 5 modules <b>Simple Machines</b> and <b>Flight and Rocketry</b>.  <b>Force and Motion</b>                      Activity 1-12                      Reader, "What is a Force", "What is Motion"  <b>Simple Machines</b>                      Activity 1-12                      Reader, "What Makes Things Move", "How are Work and Energy Related"  <b>Flight and Rocketry</b>                      Activity 6, 8-9, 11-12</p>	<p>Pages 13-117                      Pages 2-3                        Pages 13-96                      Pages 2-3                        Pages 65-72, 81-97, 111-130</p>
<p>2. Use measurement tools and standard units to compare and contrast the motion of objects such as toy cars, balls, model rockets or planes in terms of change in position, speed and direction.</p>	<p>This expectation is addressed in the grade 3 module <b>Force and Motion</b> and the grade 5 modules <b>Simple Machines</b> and <b>Flight and Rocketry</b>.  <b>Force and Motion</b>                      Activity 4-6  <b>Simple Machines</b>                      Activity 4-6  <b>Flight and Rocketry</b>                      Activity 9, 12</p>	<p>Pages 41-64                        Pages 33-55                        Pages 91-97, 121-130</p>
<p>3. Design and conduct experiments to determine how the motion of objects is related to the mass of the object and the strength of the force applied.</p>	<p>This expectation is addressed in the grade 3 module <b>Force and Motion</b> and the grade 5 modules <b>Simple Machines</b> and <b>Flight and Rocketry</b>.  <b>Force and Motion</b>                      Activity 2-3  <b>Simple Machines</b>                      Activity 2, 6  <b>Flight and Rocketry</b>                      Activity 9</p>	<p>Pages 23-39                        Pages 19-24, 49-55                        Pages 91-97</p>
<p>4. Describe how friction forces caused by air resistance or interactions between surface materials affect the motion of objects.</p>	<p>This expectation is addressed in the grade 3 module <b>Force and Motion</b> and the grade 5 modules <b>Simple Machines</b> and <b>Flight and Rocketry</b>.  <b>Force and Motion</b></p>	

5. Predict the effect of an object's mass on its motion.	Activity 4-5 Reader, "What is a Force" <b>Simple Machines</b>	Pages 41-55 Page 2
	Activity 3, 6 Reader, "What Makes Things Move" <b>Flight and Rocketry</b>	Pages 25-31, 49-55 Page 2
	Activity 2 Reader, "Trying to Fly"	Page 23-32 Page 4
	This expectation is addressed in the grade 5 module <b>Flight and Rocketry</b> .	
	Activity 3 Reader, "Lighter Than Air Flight"	Pages 33-43 Page 5

## Matter and Energy in Ecosystems

### 4.2 – All organisms depend on the living and nonliving features of the environment for survival.

4.2.a When the environment changes, some organisms survive and reproduce, and others die or move to new locations.

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Give examples of ways that living and nonliving things are interdependent within an ecosystem.	<b>Food Chains and Webs</b> Activity 1-12 Reader, "Living Things Interact", "Energy in an Ecosystem", "How do Ecosystems Change"	Pages 15-101 Pages 4-10
2. Draw diagrams showing how the sun's energy enters and is transferred from producers to consumers in a local land or aquatic food chain.	<b>Food Chains and Webs</b> Activity 10-12 Activity 12, Science Extension Reader, "Energy in an Ecosystem"	Pages 81-101 Page 101 Pages 6-9
3. Design and conduct simple investigations to record interactions among producers, consumers, herbivores, carnivores, omnivores and decomposers in an ecosystem.	<b>Food Chains and Webs</b> Activity 3-10	Pages 31-87
4. Analyze food webs to describe how energy is transferred from plants to various animals in an ecosystem.	<b>Food Chains and Webs</b> Activity 10-12 Reader, "Energy in an Ecosystem"	Pages 81-101 Pages 6-9
5. Distinguish between naturally occurring changes in ecosystems and those caused	<b>Food Chains and Webs</b> Activity 10, Science, Technology and Society	Page 87

by human activity.	Activity 12, Science, Technology and Society Reader, “ <i>How do Ecosystems Change</i> ”, “ <i>Rachel Carson</i> ”	Page 101 Pages 10, 12
6. Predict the effect an environmental change, such as drought or forest destruction, might have on the community of living things.	<b>Food Chains and Webs</b> Activity 10, Science, Technology and Society Activity 12, Science, Technology and Society Reader, “ <i>About Wolves and Moose on Isle Royale</i> ”	Page 87 Page 101 Page 14

## Energy in the Earth’s Systems

### 4.3 – Water has a major role in shaping the Earth’s surface.

4.3.a. *Water circulates through the Earth’s crust, oceans and atmosphere.*

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Describe the role of the sun’s energy (i.e., heating and cooling) in the continuous cycling of water between the earth and the atmosphere through evaporation, condensation and precipitation.	<b>Water Cycle</b> Activity 11-13 Reader, “ <i>What is the Water Cycle</i> ” <b>Weather Instruments</b> Reader	Pages 91-114 Pages 10-11  Page 6
2. Use models to demonstrate that topography causes precipitation landing on earth to move in streams and rivers from higher to lower elevations.		
3. Design and conduct simple investigations to determine how moving water (flowing downhill or in ocean waves) causes changes to the land, the coastline or the course of a stream or river.	This expectation is addressed in the grade 5 module <b>Erosion.</b> Activity 9-12	Pages 75-104
4. Pose testable questions and employ simple equipment and measuring tools to collect data about factors that affect erosion (e.g., type of earth material in an area, volume of moving water, slope of land, vegetation coverage).	This expectation is addressed in the grade 5 module <b>Erosion.</b> Activity 3-8	Pages 29-73
5. Present evidence to support a scientific claim about the relationship between the amount and speed of moving	This expectation is addressed in the grade 5 module <b>Erosion.</b> Activity 5	Pages 43-49

water and the size of earth materials moved (e.g., silt, pebbles, boulders).		
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## Science and Technology in Society

### 4.4 – Electrical and magnetic energy can be transferred and transformed.

4.4. a. Electricity in circuits can be transformed into light, heat, sound and magnetic effects.

4.4. b. Magnets can make objects move without direct contact between the object and the magnet.

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Construct complete (closed) and incomplete (open) series circuits in which electrical energy is transformed into heat, light, sound and/or motion energy.	<b>Electrical Circuits</b> Activity 1-5	Pages 13-50
2. Draw labeled diagrams of complete and incomplete circuits and explain necessary components and how components must be arranged to make a complete circuit.	<b>Electrical Circuits</b> Activity 2	Pages 19-25
3. Predict whether diagrammed circuit configurations will light a bulb.	<b>Electrical Circuits</b> Activity 2	Pages 19-25
4. Develop a method for testing conductivity, and analyze data to generalize about which materials are good electrical conductors and which are good insulators.	<b>Electrical Circuits</b> Activity 6-7	Pages 51-62
5. Observe magnetic effects associated with electricity and investigate factors that affect the strength of an electromagnet.	<b>Magnets</b> Activity 10-11 Reader, “ <i>What is an Electromagnet</i> ”	Pages 65-76 Page 10
6. Describe materials that are attracted by magnets.	<b>Magnets</b> Activity 1-2 Reader, “ <i>What is a Magnet</i> ”	Pages 13-23 Pages 2-3
7. Design procedures to move objects and separate mixtures of solids using magnets.	<b>Magnets</b> Activity 2-3	Pages 19-28
8. Investigate how magnets	<b>Magnets</b>	

<p>react with other magnets and analyze findings to identify patterns in the interactions between north and south poles of magnets.</p> <p>9. Give examples of uses of magnets (e.g., motors, generators, household devices).</p>	<p>Activity 6 Reader, <i>"What is a Magnetic Field"</i></p> <p><b>Magnets</b> Activity 3, Science, Technology and Society Activity 4, Science, Technology and Society Activity 6, Science and Social Studies Activity 11, Science, Technology and Society Reader, <i>"What is a Compass"</i>, <i>"What is an Electromagnet"</i>, <i>"How Can a Magnet Make Electricity"</i>, <i>"What Uses do Magnets Have"</i></p>	<p>Pages 41-45 Pages 4-5</p> <p>Page 28</p> <p>Page 34</p> <p>Page 45</p> <p>Page 76 Pages 8-12, 14-15</p>
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# GRADE FIVE

## Energy Transfer and Transformations

### 5.1 – Sound and light are forms of energy.

5.1. a. *Sound is a form of energy that is produced by the vibration of objects and is transmitted by the vibration of air and objects.*

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Generalize that vibrating objects produce sound if the vibrations are transferred from the object through another material (e.g., air, a solid, or a liquid).	This expectation is addressed in the grade 4 module <b>Sound</b> . Activity 2-5 Reader, “ <i>What Causes Sound</i> ”, “ <i>How Does Sound Travel</i> ”	Pages 21-35 Pages 2-4
2. Demonstrate how the loudness, pitch and quality/timbre of sound can be varied.	This expectation is addressed in the grade 4 module <b>Sound</b> . Activity 7-11 Reader, “ <i>How are Sounds Different</i> ”	Pages 59-98 Pages 6-7
3. Design and conduct investigations to determine factors that affect pitch.	This expectation is addressed in the grade 4 module <b>Sound</b> . Activity 9-11	Pages 73-98
4. Describe the properties of materials that reflect or absorb sound.	This expectation is addressed in the grade 4 module <b>Sound</b> . Activity 5 Reader, “ <i>How is Sound Absorbed and Reflected</i> ”	Pages 45-50 Page 8
5. Construct simple musical instruments (e.g., rubber band guitars, drums, etc.) that produce sounds with various pitches, volume and timbres.	This expectation is addressed in the grade 4 module <b>Sound</b> . Activity 12	Pages 99-105

## Energy Transfer and Transformations

### 5.1 – Sound and light are forms of energy.

5.1. b. *Light is a form of energy that travels in a straight line and can be reflected by a mirror, refracted by a lens, or absorbed by objects.*

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Provide evidence that light travels in straight lines away from a source in all directions.	<b>Color and Light</b> Activity 1 Activity 7, Science, Technology and Society Reader, “ <i>What is Light</i> ”	Pages 13-18 Page 67 Pages 2-3
2. Investigate how light is refracted as it passes through a lens or through one transparent	<b>Color and Light</b> Activity 1, 6 Reader, “ <i>Refraction of Light</i> ”	Pages 13-18, 53-59 Pages 5-6

material to another.		
3. Demonstrate that white light is composed of many colors.	<b>Color and Light</b> Activity 1 Reader, <i>“Electromagnetic Spectrum”</i>	Pages 13-18 Pages 8-9
4. Explain that all visible objects are reflecting some light to the human eye.	<b>Color and Light</b> Activity 11, Science and Health <b>You and Your Body</b> Reader, <i>“Nervous System”</i>	Page 100 Pages 10-11
5. Contrast the way light is reflected by smooth, shiny objects (e.g., mirror or pool of water) and how it is reflected by other objects.	<b>Color and Light</b> Reader, <i>“Reflection of Light”</i>	Page 4
6. Measure angles to predict the path of light reflected by a mirror.		
7. Determine whether a material is opaque, transparent or translucent based on how light passes through it.	<b>Color and Light</b> Activity 4, Science Challenge Activity 4, Science Extension Reader, <i>“What Happens When Light Hits Different Materials”</i>	Page 43 Page 43 Page 7
8. Design and conduct light absorption experiments that vary the size, length, direction and clarity of a shadow by changing the position of the light-blocking object or the light source.	<b>Color and Light</b> Activity 5, Science Extension	Page 52

## Structure and Function

### 5.2 – Perceiving and responding to information about the environment is critical to the survival of organisms.

5.2. a. The sense organs perceive stimuli from the environment and send signals to the brain through the nervous system.

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Explain the role of sensory organs in perceiving stimuli (e.g., light/dark, heat/cold, flavors, pain, etc.) and sending signals to the brain.	<b>You and Your Body</b> Activity 13-14	Pages 91-102
2. Pose testable questions and design experiments to explore factors that affect human	<b>You and Your Body</b> Activity 3	Pages 27-31

<p>reaction time.</p> <p>3. Conduct simple tests to explore the capabilities of the human senses.</p> <p>4. Summarize nonfiction text to explain the role of the brain and spinal cord in responding to information received from the sense organs.</p> <p>5. Identify the major structures of the human eye, ear, nose, skin and tongue, and explain their functions.</p> <p>6. Draw diagrams showing the straight path of light rays from a source to a reflecting object to the eye, allowing objects to be seen.</p> <p>7. Describe the properties of different materials and the structures in the human eye that enable humans to perceive color.</p>	<p><b>You and Your Body</b> Activity 13-14</p> <p>This expectation is addressed in the grade 3 module <b>Using Your Senses</b>. Activity 1, 5, 8, 10-11</p> <p>Reader, <i>“Our Amazing Senses”</i></p> <p>This expectation is addressed in the grade 3 module <b>Using Your Senses</b>. Activity 1 Reader, <i>“Sight”</i></p> <p><b>Color and Light</b> Reader, <i>“Nervous System”</i></p>	<p>Pages 91-102</p> <p>Pages 13-21, 45-52, 67-73, 81-95 Pages 2-12</p> <p>Pages 13-21 Pages 4-5</p> <p>Pages 10-11</p>
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## Earth in the Solar System

### 5.3 – Most objects in the solar system are in a regular and predictable motion.

5.3. a *The positions of the Earth and moon relative to the sun explain the cycles of day and night, and the monthly moon phases.*

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
<p>1. Explain the motion of the Earth relative to the sun that causes Earth to experience cycles of day and night.</p>	<p>This expectation is addressed in the grade 3 module <b>Solar System</b> and the grade 6 module <b>Earth, Moon and Sun</b>. <b>Solar System</b> Activity 9 Reader, <i>“The Inner Planets”</i> <b>Earth, Moon and Sun</b> Activity 8 Reader, <i>“What Causes Days and Years”</i></p>	<p>Pages 73-81 Page 6</p> <p>Pages 71-79 Page 8</p>
<p>2. Construct models</p>	<p>This expectation is addressed</p>	

<p>demonstrating Earth’s rotation on its axis, the moon’s revolution around the Earth, and the Earth and moon revolving around the sun.</p>	<p>in the grade 3 module <b>Solar System</b> and the grade 6 module <b>Earth, Moon and Sun. Solar System</b> Activity 2,9 <b>Earth, Moon and Sun</b> Activity 8, 10</p>	<p>Pages 21-26, 73-81 Pages 71-79, 93-101</p>
<p>3. Distinguish between the sun as a source of light and the moon as a reflection of that light.</p>	<p>This expectation is addressed in the grade 3 module <b>Solar System</b> and the grade 6 module <b>Earth, Moon and Sun. Solar System</b> Reader, “What is the Sun Like”, “Earth’s Moon” <b>Earth, Moon and Sun</b> Reader, “What is the Sun Like”, “What is the Moon Like”</p>	<p>Pages 3, 7 Pages 6-7, 13-15</p>
<p>4. Observe and record the moon’s appearance over time and analyze findings to describe the cyclical changes in its appearance from Earth (moon phases).</p>	<p>This expectation is addressed in the grade 6 module <b>Earth, Moon and Sun. Earth, Moon and Sun</b> Activity 2, 10 Reader, “What is the Moon Like”</p>	<p>Pages 21-27, 93-101 Pages 13-15</p>
<p>5. Relate the moon phases to changes in the moon’s position relative to the Earth and sun during its 29-day revolution around the Earth.</p>	<p>This expectation is addressed in the grade 3 module <b>Solar System</b> and the grade 6 module <b>Earth, Moon and Sun. Solar System</b> Reader, “Earth’s Moon” <b>Earth, Moon and Sun</b> Activity 2, 10 Reader, “What is the Moon Like”</p>	<p>Page 7 Pages 21-27, 93-101 Pages 13-15</p>

### Science and Technology in Society

**5.4 – Humans have the capacity to build and use tools to advance the quality of their lives.**

*5.4. a. Advances in technology allow individuals to acquire new information about the world.*

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
<p>1. Generalize that optical tools, such as binoculars, telescopes, eyeglasses or periscopes, change the path of light by reflecting or refracting it.</p>		
<p>2. Construct simple periscopes and telescopes, and analyze how the placement of their</p>		

<p>lenses and mirrors affects the quality of the image formed.</p> <p>3. Evaluate the best optical instrument to perform a given task.</p> <p>4. Design and conduct simple investigations to determine how the shape of a lens or mirror (concave, convex, flat) affects the direction in which light rays travel.</p> <p>5. Explain how eyeglasses or contact lenses improve vision by changing the path of light to the retina.</p> <p>6. Analyze the similarities and differences between structures of the human eye and those of a simple camera.</p>		
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# GRADE SIX

## Properties of Matter

### 6.1 – Materials can be classified as pure substances or mixtures, depending on their chemical and physical properties.

6.1. a. Mixtures are made of combinations of elements and/or compounds, and they can be separated by using a variety of physical means.

6.1. b. Pure substances can be either elements or compounds, and they cannot be broken down by physical means.

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Describe the structure of the atom and its component parts.	<b>Matter and Change</b> Activity 4 Reader, "What Makes Up Matter"	Pages 37-44 Pages 2-3
2. Explain that density (mass/volume) is a characteristic property that can be used to identify an element or substance.	<b>Matter and Change</b> Activity 1 Reader, "What are Physical Properties and Changes"	Pages 13-19 Pages 13-14
3. Compare and contrast the properties of a metal (aluminum, iron, etc.) with a nonmetal (oxygen, carbon, etc.)	<b>Matter and Change</b> Reader, "What Makes Up Matter"	Page 5
4. Illustrate the differences in the physical and chemical properties of a molecule and the individual atoms that bonded to form that molecule.	<b>Matter and Change</b> Activity 5, 7 Reader, "What are Physical Properties and Changes"	Pages 45-51, 63-68 Pages 16-18
5. Differentiate between a mixture and an element or compound and identify examples.	<b>Matter and Change</b> Activity 3, 5-6 Reader, "What Makes Up Matter", "What are Physical Properties and Changes"	Pages 29-35, 45-61 Pages 4-8, 14-15
6. Conduct and report on an investigation that uses physical means such as particle size, density, solubility and magnetism to separate substances in a mixture.	<b>Matter and Change</b> Activity 3	Pages 29-35
7. Use the patterns in the Periodic Table to locate metals, semimetals and nonmetals and to predict the general characteristics of an element.	<b>Matter and Change</b> Activity 4 Reader, "What Makes Up Matter"	Pages 37-44 Pages 4-5

## Matter and Energy in Ecosystems

### 6.2 – An ecosystem is composed of all the populations that are living in a certain space and the physical factors with which they interact.

6.2. a Populations in ecosystems are affected by biotic factors, such as other populations, and abiotic factors, such as soil and water supply.

6.2. b Populations in ecosystems can be categorized as producers, consumers and decomposers of organic matter.

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
<p>1. Analyze and interpret how biotic and abiotic factors interact within a given ecosystem.</p> <p>2. Design and conduct a scientific investigation to explore the porosity and permeability of soils and their ability to support different plant life.</p> <p>3. Defend the statement, “The sun is the main source of energy on Earth.”</p> <p>4. Express in general terms how plants and other photosynthetic organisms use the sun’s energy.</p> <p>5. Investigate and report on the effects of abiotic factors on a plant’s ability to photosynthesize.</p>	<p><b>Pollution</b> Activity 10 Reader, “<i>Water Pollution</i>”, “<i>Rachel Carson</i>”</p> <p><b>Plants in Our World</b> Reader, “<i>What is a Plant</i>” This expectation is also addressed in the grade 4 module <b>Food Chains and Webs</b>. Activity 1-12</p>	<p>Pages 71-76 Pages 9-11, 14</p> <p>Page 2</p> <p>Pages 15-101</p>
	<p><b>Erosion</b> Activity 7</p>	<p>Pages 59-66</p>
	<p><b>Oceans</b> Activity 10 Reader, “<i>How do Oceans Affect Weather and Climate</i>”</p> <p><b>Plants in Our World</b> Reader, “<i>How do Plants Grow, Survive, and Reproduce</i>”</p> <p><b>Weather Forecasting</b> Reader, “<i>How is Weather Data Gathered</i>”</p> <p><b>DNA-From Genes to Proteins</b> Reader, “<i>How do Cells Carry Out Life Processes</i>”</p>	<p>Pages 55-63 Page 10</p> <p>Pages 3-4</p> <p>Page 4</p> <p>Page 10</p>
	<p><b>Plants in Our World</b> Activity 8-9 Reader, “<i>How do Plants Grow, Survive, and Reproduce</i>”</p> <p><b>DNA-From Genes to Proteins</b> Reader, “<i>How do Cells Carry Out Life Processes</i>”</p>	<p>Pages 73-86 Pages 3-4</p> <p>Page 10</p>
	<p><b>Plants in Our World</b> Activity 8-9 Reader, “<i>How do Plants Grow, Survive, and Reproduce</i>”</p> <p><b>DNA-From Genes to Proteins</b> Reader, “<i>How do Cells Carry</i></p>	<p>Pages 73-86 Pages 3-4</p>

<p>6. Compare and contrast how energy and matter flow in a Connecticut ecosystem, emphasizing the interactions among producers, consumers and decomposers.</p>	<p><i>Out Life Processes”</i></p> <p>This expectation is supported in the grade 4 module <b>Food Chains and Webs</b>. Activity 1-12 Reader, “<i>What is a Pond Ecosystem</i>”, “<i>Living Things Interact</i>”, “<i>Energy in an Ecosystem</i>”</p>	<p>Page 10</p> <p>Pages 15-101 Pages 2-9</p>
<p>7. Identify local examples of predator-prey relationships and justify the impact of each type of population on the other.</p>	<p>This expectation is supported in the grade 4 module <b>Food Chains and Webs</b>. Activity 5, 7, 10</p> <p>Reader, “<i>Living Things Interact</i>”</p>	<p>Pages 47-52, 59-66, 81-87 Page 4</p>
<p>8. Create and interpret graphs that illustrate the fluctuation of populations over time.</p>		
<p>9. Distinguish a food chain from a food web and identify local examples of each.</p>	<p>This expectation is supported in the grade 4 module <b>Food Chains and Webs</b>. Activity 11-12 Reader, “<i>Energy in Ecosystems</i>”</p>	<p>Pages 89-101 Pages 7-8</p>
<p>10. Explain the impact of environmental conditions such as climate, elevation, topography or water quality on food chains.</p>	<p>This expectation is addressed in the grade 4 module <b>Food Chains and Webs</b>. Activity 12, Science, Technology and Society</p>	<p>Page 101</p>
<p>11. Predict what will happen to a population based on current trends (fires, disease, overhunting, development) and defend the prediction.</p>		

### Energy in the Earth’s Systems

#### 6.3 – Variation in the amount of the sun’s energy hitting the Earth’s surface affects daily and seasonal weather patterns.

6.3. a Local and regional weather are affected by the amount of solar energy the area receives and proximity to a large body of water.

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
<p>1. Compare the composition and structure of the Earth’s atmospheric layers.</p>	<p><b>Weather Forecasting</b> Reader, “<i>Why do We Predict the Weather</i>”</p>	<p>Page 2</p>

<p>2. Demonstrate how changes in temperature, pressure, moisture and density of air affect weather patterns (e.g., air masses and air pressure.)</p>	<p><b>Weather Forecasting</b> Activity 5-8 Reader, <i>"What do Weather Maps Show"</i></p>	<p>Pages 47-68 Page 6</p>
<p>3. Describe in writing how solar energy drives Earth's weather systems.</p>	<p><b>Weather Forecasting</b> Activity 9 Reader, <i>"How is Weather Data Gathered"</i> <b>Oceans</b> Activity 5 Reader, <i>"How do Oceans Affect Weather and Climate"</i></p>	<p>Pages 69-74 Page 4  Pages 55-63 Page 10</p>
<p>4. Investigate and report on how the introduction of heat affects the motion of particles and the distance between them.</p>	<p><b>Matter and Change</b> Reader, <i>"How Does Matter Behave"</i></p>	<p>Pages 9-12</p>
<p>5. Illustrate the transfer of energy as matter changes phase.</p>	<p><b>Matter and Change</b> Reader, <i>"How Does Matter Behave"</i></p>	<p>Pages 9-12</p>
<p>6. Design, conduct and report in writing an investigation that reveals different substances absorb and release heat at different rates.</p>		
<p>7. Research and give examples of heat transfer and local weather differences in Connecticut.</p>		
<p>8. Investigate and explain the movement of local winds, including "sea breezes" and "land breezes," based on the uneven heating of the Earth's surface and a change in air pressure.</p>	<p><b>Weather Forecasting</b> Reader, <i>"Winds Have Names"</i></p>	<p>Page 15</p>
<p>9. Examine and explain that global winds are caused by uneven heating of the Earth's surface and the rotation of the Earth.</p>	<p><b>Weather Forecasting</b> Reader, <i>"Winds Have Names"</i></p>	<p>Page 15</p>
<p>10. Design a weather forecast</p>	<p><b>Weather Forecasting</b> Activity 2-7, 10-11</p>	

based on collected weather data.		Pages 19-61, 75-86
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## Science and Technology in Society

### 6.4 – Water moving across and through earth materials carries with it the products of human activities.

#### 6.4.a Most precipitation that falls on Connecticut eventually reaches Long Island Sound

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Discuss and chart the reasons why water is essential for life.	<b>Oceans</b> Reader, “ <i>Ocean Resources</i> ” <b>Pollution</b> Reader, “ <i>Water Pollution</i> ”	Page 11 Pages 9-11
2. Observe, analyze and record the unique physical and chemical properties of water.	<b>Oceans</b> Activity 2-3	Pages 23-31
3. Research the differences in quantities between fresh water (solid and liquid) and salt water covering the Earth’s surface and report on the impact to humans.	<b>Oceans</b> Activity 1 Reader, “ <i>Why is Earth the Water Planet</i> ”	Pages 13-21 Page 2
4. Investigate and explain in writing how substances, both harmful and beneficial, dissolve in and are carried by surface and ground water.	<b>Pollution</b> Activity 9-10 Reader, “ <i>Water Pollution</i> ”	Pages 65-76 Pages 9-11
5. Use appropriate maps to locate and identify the major watersheds that drain into Long Island Sound and analyze how the topography influences the way water moves in the Long Island Sound watershed.		
6. Research and evaluate in writing the effects of common point and nonpoint water pollutants in Connecticut.		
7. Compare and contrast the general structures, processes and limitations of a septic system to a secondary wastewater treatment plant.		
8. Debate the effectiveness of a law designed to protect water resources.		

# GRADE SEVEN

## Energy Transfer and Transformations

### 7.1 – Energy provides the ability to do work and it can exist in many forms.

7.1. a Work is the process of making objects move through the application of force.

7.1. b Energy can be stored in many forms and can be transformed into the energy of motion.

Grade-Level Expectations Students should be able to:	DSM Investigations	Page(s)
1. Conduct simple experiments that show and explain how forces work to change the motion of an object.	<b>Newton's Toy Box</b> Activity 1-13 Reader, "Motion and Speed", "Forces and Motion", "Newton's Laws of Motion"	Pages 13-90 Pages 1-13
2. Calculate work done on an object as force or distance varies.	<b>Newton's Toy Box</b> Reader, "Work, Energy and Power"	Page 14
3. Explain in writing how the six simple machines make work easier but do not alter the amount of work done on an object, and demonstrate how everyday objects function as simple machines	<b>Newton's Toy Box</b> Reader, "Machines and Work" This expectation is further addressed in the grade six module <b>Simple Machines</b> . Activity 2,5, 8-11 Reader, "What are Simple Machines"	Pages 15-21  Pages 19-29, 39-47, 65-89 Pages 4-9
4. Determine ways to modify a simple machine (inclined plane, pulley and lever) to improve its mechanical advantage.	This expectation is addressed in the grade six module <b>Simple Machines</b> . Activity 2, 8-9 Reader, "What are Simple Machines"	Pages 19-29, 65-89 Pages 4-6, 8
5. Defend the statement, "Work output of a machine is always less than work input because of energy lost due to friction."	<b>Newton's Toy Box</b> Reader, "What is Friction", "Machines and Work" This expectation is further addressed in the grade six module <b>Simple Machines</b> . Activity 3-4, 6	Pages 6-7, 15-21  Pages 25-37, 49-55
6. Design and create a working compound machine from several simple machines.	This expectation is addressed in the grade six module <b>Simple Machines</b> . Activity 12, Science Challenge	Page 95
7. Use a diagram or model of a moving object (roller coaster, pendulum, etc.) to describe the conversion of potential energy into kinetic energy and vice versa.	<b>Newton's Toy Box</b> Activity 7-13 Reader, "Work, Energy and Power"	Pages 49-90 Page 14

<p>8. Discuss different forms of energy and describe how they can be converted from one form to another for use by humans (e.g., thermal, electrical, light, chemical, mechanical).</p> <p>9. Trace energy conversions that occur in the human body once food enters and explain the conversions in writing.</p> <p>10. Calculate potential and kinetic energy and relate those quantities to total energy in a system.</p>	<p><b>Newton's Toy Box</b> Activity 7-10</p> <p><b>Electrical Connections</b> Activity 2-3, 11 Reader, "What is Electric Current", "Electricity and Magnetism", "Generating Electric Current", "Electricity in Everyday Life"</p>	<p>Pages 49-72</p> <p>Pages 21-33, 89-94 Pages 7-8, 13-18</p>
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## Structure and Function

### 7.2 – Many organisms, including humans, have specialized organ systems that interact with each other to maintain dynamic internal balance.

7.2. a. All organisms are composed of one or more cells; each cell carries on life-sustaining functions.

7.2. b. Multicellular organisms need specialized structures and systems to perform basic life functions.

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
<p>1. Compare and contrast single-celled organisms with multicellular organisms.</p> <p>2. Illustrate and describe in writing the structure and the functions of the following: cell membrane, cytoplasm, mitochondria and nucleus of an animal cell.</p> <p>3. Explain how the structure and function of multicellular organisms (animals) depends on the interaction of cells, tissues, organs and organ systems.</p> <p>4. Investigate and explain in writing the basic structure and function of the human skeletal</p>	<p><b>Plants in Our World</b> Activity 1 Reader, "What is a Plant"</p> <p><b>DNA-From Genes to Proteins</b> Activity 3-4 Reader, "What is a Cell", "What is Inside a Cell"</p> <p><b>Plants in Our World</b> Activity 1-2 <b>DNA-From Genes to Proteins</b> Reader, "What are Cells"</p> <p>This expectation is addressed in the grade six module <b>You and Your Body</b>.</p>	<p>Pages 13-25 Page 2</p> <p>Pages 25-39 Pages 3-4</p> <p>Pages 13-33, 41-47 Page 3</p>

<p>system.</p> <p>5. Differentiate between the structures and range of motion associated with ball, socket and hinge joints and relate human joints to simple machines.</p> <p>6. Demonstrate how the muscles, tendons, ligaments and bones interact to support the human body and allow movement.</p> <p>7. Label the major parts of the human respiratory system and explain in writing the function of each part (nasal cavity, trachea, bronchi, lungs and diaphragm).</p> <p>8. Label the major parts of the human circulatory system and explain in writing the function of each part (heart, veins, arteries and capillaries).</p> <p>9. Design and conduct controlled variable experiments to analyze the interaction between the circulatory and respiratory systems as the demand for oxygen changes.</p> <p>10. Label the major parts of the human digestive system and explain in writing the function of each part in the chemical and physical breakdown of food (mouth, esophagus, stomach, small intestine, large intestine and rectum).</p>	<p>Activity 1 Reader, "<i>Skeletal System</i>"</p> <p>This expectation is addressed in the grade six module <b>You and Your Body</b>. Activity 1 Reader, "<i>Skeletal System</i>"</p> <p>This expectation is addressed in the grade six module <b>You and Your Body</b>. Activity 2 Reader, "<i>Muscular System</i>"</p> <p>This expectation is addressed in the grade six module <b>You and Your Body</b>. Activity 5-6 Reader, "<i>Respiratory System</i>"</p> <p>This expectation is addressed in the grade six module <b>You and Your Body</b>. Activity 4 Reader, "<i>Circulatory System</i>"</p> <p>This expectation is addressed in the grade six module <b>You and Your Body</b>. Reader, "<i>Digestive System</i>"</p>	<p>Pages 13-18 Page 4</p> <p>Pages 13-18 Page 4</p> <p>Pages 19-25 Page 5</p> <p>Pages 41-54 Page 8</p> <p>Pages 33-39 Pages 6-7</p> <p>Page 10</p>
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## Energy in the Earth's Systems

### 7.3 – Landforms are the result of the interaction of constructive and destructive forces over time.

7.3. a. Volcanic activity and the folding and faulting of rock layers during the shifting of the Earth's crust affect the formation of mountains, ridges and valleys.

7.3. b. Glaciation, weathering and erosion change the Earth's surface by moving earth materials from place to place.

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Illustrate and describe in writing the composition of the three major layers of the Earth's interior.	<b>Earth Processes</b> Activity 2 Reader, "What is Inside Earth"	Pages 23-28 Pages 2-3
2. Explain how Earth's internal energy is transferred to move tectonic plates.	<b>Earth Processes</b> Activity 12-13 Reader, "What is Inside Earth", "Sea Floor Spreading"	Pages 105-120 Pages 2, 6
3. Demonstrate the processes of folding and faulting of the Earth's crust.	<b>Earth Processes</b> Activity 7 Reader, "Plate Movements"	Pages 63-69 Page 8
4. Correlate common geological features/events (deep sea trenches, mountains, earthquakes, volcanoes) with the location of plate boundaries.	<b>Earth Processes</b> Activity 10-13-14 Reader, "Plate Movements"	Pages 89-95, 11-129 Pages 6-10
5. Compare geological features that result from constructive forces (e.g., mountains and ridges) with geological features that result from destructive forces (e.g., canyons and flood plains).	<b>Earth Processes</b> Activity 5, 7 Reader, "Plate Movements", "Weathering, Erosion and Deposition"	Pages 47-54, 63-69 Pages 6-15
6. Analyze and interpret data about the location, frequency and intensity of earthquakes.	<b>Earth Processes</b> Activity 10	Pages 89-95
7. Compare and contrast the major agents of erosion and deposition of sediments: running water, moving ice, wave action, wind and mass movement due to gravity.	<b>Earth Processes</b> Reader, "Weathering, Erosion and Deposition"	Pages 11-15
8. Investigate and determine how glaciers form and affect the Earth's surface as they	<b>Earth Processes</b> Reader, "Weathering, Erosion and Deposition"	Page 14

change over time.		
9. Distinguish between weathering and erosion.	<b>Earth Processes</b> Activity 3 Reader, “ <i>Weathering, Erosion and Deposition</i> ”	Pages 29-37 Pages 11-15
10. Observe and report on the geological events that are responsible for having shaped Connecticut’s landscape.	The <b>Earth Processes</b> module provides the opportunity to address this expectation.	

### Science and Technology in Society

#### 7.4 – Technology allows us to improve food production and preservation, thus improving our ability to meet the nutritional needs of growing populations.

7.4.a. Various microbes compete with humans for the same sources of food.

<b>Grade-Level Expectations</b> <i>Students should be able to:</i>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Investigate and describe in writing different types of microbes and the environmental conditions necessary for their survival.		
2. Describe the optimum conditions for rapid bacterial growth.		
3. Illustrate and describe the structural differences between bacterial and animal cells.	<b>DNA-from genes to Proteins</b> Reader, “ <i>What is Inside a Cell</i> ”	Pages 5-6
4. Discover and discuss how humans use bacteria to produce food and identify examples.		
5. Compare and contrast the role of bacteria in food production and food spoilage.		
6. Evaluate and report how each method of food preservation including dehydration, pickling, irradiation and refrigeration works to stop or inhibit bacterial growth and give examples of each.		

# GRADE EIGHT

## Forces and Motion

### 8.1 – An object’s inertia causes it to continue moving the way it is moving unless it is acted upon by a force to change its motion.

8.1. a The motion of an object can be described by its position, direction of motion and speed.

8.1. b unbalanced force acting on an object changes its speed and/or direction of motion.

8.1. c Objects moving in circles must experience force acting toward the center.

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Use appropriate tools and techniques to make observations and gather data to determine how forces, including friction, act on an object to change its position over time in relation to a fixed point of reference.	<b>Newton’s Toy Box</b> Activity 3-13 Reader, “ <i>Forces and Motion</i> ”	Pages 25-90 Pages 4-9
2. Calculate the average speed of a moving object, and distinguish between instantaneous speed and average speed of an object.	<b>Newton’s Toy Box</b> Activity 7-9 Reader, “ <i>Motion and Speed</i> ”	Pages 49-65 Pages 2-3
3. Create and interpret distance-time graphs for objects moving at constant and nonconstant speeds.		
4. Predict the motion of an object given the magnitude and direction of forces acting on it (net force).	<b>Newton’s Toy Box</b> Activity 1-13	Pages 13-90
5. Investigate and demonstrate how unbalanced forces cause acceleration (change in speed and/or direction of an object’s motion).	<b>Newton’s Toy Box</b> Activity 7-13 Reader, “ <i>Forces and Motion</i> ”, “ <i>Newton’s Laws of Motion</i> ”	Pages 49-90 Pages 4-13
6. Assess in writing the relationship between an object’s mass and its inertia when at rest and in motion.	DSM provides the opportunity to address this expectation. See below: <b>Newton’s Toy Box</b> Activity 1-3, 7 Reader, “ <i>Forces and Motion</i> ”, “ <i>Newton’s Laws of Motion</i> ”	Pages 13-31, 58-65 Pages 4-13
7. Express mathematically how the mass of an object and the	<b>Newton’s Toy Box</b>	

force acting on it affect its acceleration.	Activity 9, Science Extension Reader, <i>"Newton's Laws of Motion"</i>	Page 65 Page 12
8. Design and conduct an experiment to determine how gravity and friction (air resistance) affect a falling object.	<b>Newton's Toy Box</b> Activity 3-4	Pages 31-38
9. Illustrate how the circular motion of an object is caused by a center-seeking force (centripetal force) resulting in the object's constant acceleration.	<b>Newton's Toy Box</b> Activity 6, 13 Reader, <i>"About Satellite Motion"</i>	Pages 45-48, 85-90 Page 23

## Heredity and Evolution

### 8.2 – Reproduction is a characteristic of living systems and it is essential for the continuation of every species.

8.2. a Heredity is the passage of genetic information from one generation to another.

8.2. b Some of the characteristics of an organism are inherited and some result from interactions with the environment.

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Relate the continued existence of any species to its successful reproduction and explain in writing the factors that contribute to successful reproduction.	DSM provides the opportunity to address this expectation. See below: <b>DNA-From Genes to Proteins</b> Reader, <i>"Heredity and Genetics"</i>	Pages 15-20
2. Describe the structure, location and function of chromosomes, genes and DNA and how they relate to each other in the living cell.	<b>DNA-From Genes to Proteins</b> Activity 5-6 Reader	Pages 41-58 Pages 12-14
3. Illustrate and chart the purpose, cell type (somatic and germ) and resulting chromosome count during cell division in mitosis and meiosis.	<b>DNA-From Genes to Proteins</b> Activity 5 Reader, <i>"How do Cells Grow and Reproduce"</i> , <i>"Heredity and Genetics"</i>	Pages 41-49 Pages 14, 18
4. Identify the major structures in human male and female reproductive systems and explain where meiosis and gamete formation take place.		
5. Investigate and report on the role of hormone production as it initiates and regulates the creation of male and female germ cells from birth through adolescence and into		

adulthood.		
6. Compare and contrast the events and processes that occur when a human egg is fertilized or not fertilized.	<b>DNA-From Genes to Proteins</b> Reader, <i>"Heredity and Genetics"</i>	Page 18
7. Demonstrate the relationship of corresponding genes on pairs of chromosomes to traits inherited by offspring.	<b>DNA-From Genes to Proteins</b> Activity 3, Science Challenge Activity 3, Science Extension Reader, <i>"Heredity and Genetics"</i>	Page 29 Page 29 Pages 15-19
8. Describe in writing the role of the germ cells in the formation of the human zygote and its resulting 23 pairs of chromosomes, the 23rd of which determines gender and the other 22 of which determine the characteristics of that offspring.		

### Earth in the Solar System

#### 8.3 – The solar system is composed of planets and other objects that orbit the sun.

8.3. a Gravity is the force that governs the motions of objects in the solar system.

8.3. b The motion of the Earth and moon relative to the sun causes daily, monthly and yearly cycles on Earth

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
1. Relate the strength of gravitational force between two objects to their mass and the distance between the centers of the two objects and provide examples.	<b>Newton's Toy Box</b> Activity 3 Reader, <i>"Forces and Motion"</i>	Page 8
2. Describe in writing how gravitational attraction and the inertia of objects in the solar system keep them on a predictable elliptical pathway.	<b>Earth, Moon and Sun</b> Reader, <i>"Where is Earth in Space"</i> <b>Astronomy</b> Reader, <i>"What Makes Up Our Solar System"</i>	Page 5  Page 3
3. Distinguish between rotation of Earth on its axis and its elliptical revolution around the sun.	<b>Earth, Moon and Sun</b> Activity 6-9 Reader, <i>"What Causes Days and Years"</i> <b>Astronomy</b> Activity 2, 4 Reader, <i>"What Makes Up Our Solar System"</i>	Pages 53-92 Pages 8-10  Pages 23-29, 41-49 Page 2

<p>4. Investigate and report in writing how the Earth's revolution around the sun affects changes in daylight and seasons.</p>	<p><b>Earth, Moon and Sun</b> Activity 8-9 Reader, "What Causes Days and Years", "What Causes Seasons" <b>Astronomy</b> Activity 5</p>	<p>Pages 71-92 Pages 8-12</p>
<p>5. Compare the revolution times of all the planets and relate it to their distance from the sun.</p>	<p>DSM provides the opportunity to address this expectation. See below: <b>Earth, Moon and Sun</b> Activity 4 Reader, "About the Planets" <b>Astronomy</b> Activity 6 Reader, "What Makes Up Our Solar System"</p>	<p>Pages 51-60</p>
<p>6. Conduct and report on an investigation that shows how the Earth's tilt on its axis and position around the sun relates to the intensity of light striking the Earth's surface.</p>	<p><b>Earth, Moon and Sun</b> Activity 9 Reader, "What Causes Seasons"</p>	<p>Pages 37-44 Pages 22-23</p>
<p>7. Use a model to demonstrate the phases of the moon relative to the position of the sun, Earth and moon.</p>	<p><b>Earth, Moon and Sun</b> Activity 10 Reader, "What is the Moon Like"</p>	<p>Pages 61-68 Pages 4-7</p>
<p>8. Develop a model or illustration to show the relative positions of the Earth, sun and moon during a lunar and solar eclipse and explain how those positions influence the view from Earth.</p>	<p><b>Earth, Moon and Sun</b> Activity 11 Reader, "What Causes Eclipses"</p>	<p>Pages 81-92 Pages 11-12</p>
		<p>Pages 93-101 Pages 14-15</p> <p>Pages 103-109 Pages 18-19</p>

### Science and Technology in Society

**8.4 – In the design of structures there is a need to consider factors such as function, materials, safety, cost and appearance.**

8.4. a Bridges can be designed in different ways to withstand certain loads and potentially destructive forces.

<b>Grade-Level Expectations Students should be able to:</b>	<b>DSM Investigations</b>	<b>Page(s)</b>
<p>Identify the forces acting on a truss, beam and suspension bridge, including compression, tension and gravity using models, pictures or diagrams.</p>		

<p>Explain in writing the advantages and disadvantages of truss, beam and suspension bridge design and visually identify each bridge.</p> <p>Conduct an experiment to discover and report on a bridge's ability to support a load based on the interplay of tension and compression forces that result in a net force of zero.</p> <p>Use technology to simulate how engineers plan, test and revise bridge designs given parameters including cost, time, safety and aesthetics.</p>		
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