

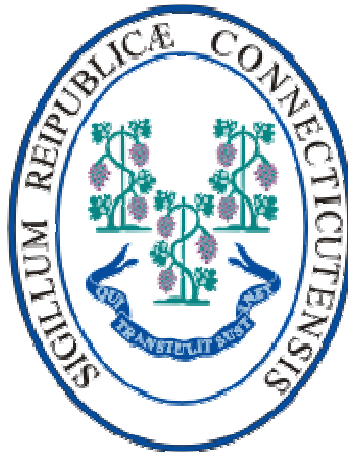


FOSS Full Option Science System
(FOSS™)

Pre-K-8

Correlation to the

**Connecticut
Science
Framework**



Connecticut Science Framework

Correlation with Full Option Science System
(FOSS™)

Pre K-8

The following correlation of the Connecticut Science Framework to the Full Option Science System (FOSS) 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.

Preschool Curriculum Framework	Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
<p>Cognitive Development: Logical-Mathematical/Scientific Thinking</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>Fabric Investigation 1, Parts 1 and 2</p> <p>Wood and Paper Investigation 1, Parts 1-4</p> <p>Air and Weather Investigation 3, Parts 1-4</p> <p>Pebbles, Sand and Silt Investigation 1, Parts 1 and 2</p>	<p>Pages 6-15</p> <p>Pages 8-23</p> <p>Pages 8-27</p> <p>Pages 8-17</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>Fabric Investigation 2, Parts 1 and 2</p> <p>Trees Investigation 1, Part 7</p> <p>Animals Two by Two Investigation 3, Parts 1-3</p> <p>Air and Weather Investigation 2, Parts 2 and 4</p> <p>New Plants Investigation 2, Part 3</p> <p>Pebbles, Sand and Silt Investigation 2, Parts 1 and 2</p> <p>Insects and Plants Investigation 1, Parts 1-3</p> <p>Plants and Animals Investigation 3, Parts 1-3</p>	<p>Pages 7-17</p> <p>Pages 31-34</p> <p>Pages 8-20</p> <p>Pages 14-19, 24-27</p> <p>Pages 20-28</p> <p>Pages 8-17</p> <p>Pages 52-75</p> <p>Pages 87-108</p>
	<p>3. Make comments or express curiosity about observed phenomena (e.g., "I notice that..." or "I wonder if...").</p>	<p>Fabric Investigation 1, Part 1 Investigation 2, Part 2</p> <p>Wood and Paper Investigation 1, Parts 1 and 3 Investigation 3, Parts 1 and 4</p> <p>Trees Investigation 1, Part 1</p> <p>Student Journal Questions</p> <p>Pebbles Sand and Silt</p>	<p>Pages 6-11 Pages 7-11</p> <p>Pages 8-13, 20-23 Pages 8-12, 22-25</p> <p>Pages 7-14</p> <p>SS #32</p>

	<p>4. Count, order and sort objects (e.g., blocks, crayons, toys) based on one visible property (e.g., color, shape, size).</p> <p>5. Conduct simple tests to determine if objects roll, slide or bounce.</p>	<p>Investigation 1, Parts 1-3 Investigation 2, Parts 1-4 Air and Weather Investigation 1, Parts 1-6 Investigation 2, Part 3</p> <p>Trees Investigation 2, Parts 2-4 Wood and Paper Investigation 1, Part 2 Pebbles, Sand and Silt Investigation 1, Parts 3 and 4 Solids and Liquids Investigation 3, Part 2 Investigation 3, Part 4</p> <p>Balance and Motion Investigation 2, Parts 1-3 Investigation 3, Parts 1-3 Home/School Connection, “Rollers” FOSSWeb, “Roller Coasters!”</p>	<p>Pages 8-21 Pages 8-20</p> <p>Pages 8-38 Pages 20-23</p> <p>Pages 10-22</p> <p>Pages 8-14</p> <p>Pages 18-25</p> <p>Pages 14-18 Pages 24-27</p> <p>Pages 8-25 Pages 6-25</p> <p>Page 27 SS#21</p>
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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:	FOSS Investigations	Page(s)
<p>Cognitive Development: Logical-Mathematical/Scientific Thinking</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</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>Animals Two by Two Investigation 1, Parts 1-4 Investigation 2, Parts 1 and 3 Investigation 3, Parts 1-3 Investigation 4, Parts 1 and 2</p> <p>Trees Investigation 1, Parts 1 and 2 Investigation 3, Parts 1-9</p> <p>Insects Investigation 1, Parts 1-3 Investigation 2, Parts 1-3 Investigation 3, Parts 1-3 Investigation 4, Parts 1-5 Investigation 5, Parts 1-3</p> <p>Insects and Plants Investigation 5, Parts 1-3</p> <p>Plants and Animals Investigation 1, Parts 1-3</p> <p>Fabric Investigation 1, Parts 1 and 2</p> <p>Wood and Paper</p>	<p>Pages 10-29 Pages 9-13, 18-21 Pages 8-20 Pages 8-23</p> <p>Pages 7-19 Pages 10-38</p> <p>Pages 8-25 Pages 8-27 Pages 8-26 Pages 10-31 Pages 10-24</p> <p>Pages 206-225</p> <p>Pages 47-72</p>

<p>events.</p> <p>Personal and Social Development</p> <p>Identify themselves by family and gender.</p> <p>State at least two ways in which children are similar and two ways in which they are different.</p>	<p>3. Make observations and distinguish between the characteristics of plants and animals.</p> <p>4. Compare attributes of self, family members or classmates, and describe how they are similar and different.</p> <p>5. Describe the similarities and differences in the appearance and behaviors of plants, birds, fish, insects and mammals (including humans).</p>	<p>Investigation 1, Parts 1-4 Pebbles, Sand and Silt Investigation 1, Parts 1 and 2</p> <p>Animals Two by Two Investigation 1, Part 2 Science Stories Trees Investigation 1, Part 2 Science Stories</p> <p>Animals Two by Two Investigation 1, Parts 1-4 Investigation 2, Parts 1-3 Investigation 3, Parts 1-3 Investigation 4, Parts 1-4 Investigation 5, Parts 1-4 Science Stories, "Learning About Animals"</p>	<p>Pages 6-15 Pages 8-23</p> <p>Pages 17-21 Pages 3-24</p> <p>Pages 15-19 Page 3</p> <p>Pages 10-29 Pages 9-21 Pages 8-20 Pages 8-24 Pages 10-27 Pages 3-24</p>
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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.

Preschool Curriculum Framework	Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
<p>Cognitive Development: Logical-Mathematical/Scientific Thinking</p> <p>Ask questions about and comment on observations and experimentation.</p>	<p>1. Use the senses to observe and describe evidence of current or recent weather conditions (e.g., flags blowing, frost on window, puddles after rain, etc.).</p> <p>2. Notice weather conditions and use words and numbers to describe and analyze conditions over time (e.g., "it rained five times this month").</p>	<p>Air and Weather Investigation 2, Parts 1-4 Investigation 3, Parts 1-4 Science Stories, "What's the Weather Today?"</p> <p>Air and Weather Investigation 4, Parts 1 and 2</p>	<p>Pages 8-27 Pages 8-27</p> <p>Page 7-14</p> <p>Page 8-18</p>

<p>Collect, describe and record information.</p> <p>Demonstrate an understanding of sequence of events and time periods.</p> <p>Make and verify predictions about what will occur.</p> <p>Personal and Social Development</p> <p>Use self-help skills</p>	<p>3. Identify the season that corresponds with observable conditions (e.g., falling leaves, snow vs. rain, buds on trees or greener grass).</p> <p>4. Make judgments about appropriate clothing and activities based on weather conditions.</p>	<p>Air and Weather Investigation 4, Part 2 Science Stories, "Seasons" Trees Investigation 3, Parts 1-9 Science Stories, "My Apple Tree," "Orange Trees," and "Maple Trees"</p> <p>Air and Weather Investigation 4, Home/School Connection FOSSWeb Activity, "Dress the Bear"</p>	<p>Pages 12-18</p> <p>Pages 18-23</p> <p>Pages 10-38</p> <p>Pages 14-22</p> <p>TG page 27, SS #44</p> <p>TG pages 4-5</p>
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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.

Preschool Curriculum Framework	Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
<p>Cognitive Development: Logical-Mathematical/Scientific Thinking</p> <p>Ask questions about and comment on observations and experimentation.</p> <p>Sort objects by one or more attributes and regroup the objects based on a new attribute.</p> <p>Make and verify predictions about what will occur.</p> <p>Engage in a scientific experiment with a peer or with a small group.</p>	<p>1. Observe, describe and sort building materials by properties such as strength, weight, stiffness or flexibility.</p> <p>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>	<p>Wood and Paper Investigation 1, Parts 1 and 2 Investigation 2, Parts 1-4 Investigation 5, Part 3 Science Extensions Pebbles, Sand and Silt Investigation 3, Part 1 Investigation 3, Part 5 Science Stories, "Making Things with Rocks" Solids and Liquids Investigation 1. Parts 1 and 2</p> <p>Wood and Paper Investigation 1, Social Studies Extension Science Stories, "The Story of a Chair" Pebbles, Sand and Silt Investigation 3, Part 1 Investigation 3, Part 5 Solids and Liquids Investigation 1, Part 3</p>	<p>Pages 8-19</p> <p>Pages 8-23 Pages 18-23 Page 23</p> <p>Pages 8-11 Pages 24-29</p> <p>Pages 14-17</p> <p>Pages 8-20</p> <p>Pages 34-35</p> <p>Pages 3-8</p> <p>Pages 8-11 Pages 24-29</p> <p>Pages 21-24</p>

<p>Personal and Social Development</p> <p>Demonstrate the ability to use a minimum of two different strategies to attempt to solve a problem.</p> <p>Creative Expression/Aesthetic Development</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>	<p>Science Extensions, <i>“Build a Paper Bridge”</i></p> <p>Wood and Paper Investigation 1, Social Studies Extension Science Stories, <i>“The Story of a Chair”</i></p> <p>Solids and Liquids Investigation 1, Part 3</p> <p>Wood and Paper Investigation 5, Part 3</p> <p>Pebbles, Sand and Silt Investigation 3 Social Studies Extension</p> <p>Solids and Liquids Investigation 1, Part 3</p> <p>Pebbles, Sand and Silt FOSSWeb, Media – Pictures, <i>“Rock Uses”</i> Activity, <i>“Find Earth Materials”</i></p>	<p>Page 28</p> <p>Pages 34-35</p> <p>Pages 3-8</p> <p>Pages 21-24</p> <p>Pages 18-21</p> <p>Page 31</p> <p>Pages 21-24</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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
1. Match each of the five senses with its associated body part and the kind of information it perceives.	Fabric Investigation 1, Part 1 Wood and Paper Investigation 1, Part 1 Science Stories: "Are You a Scientist?" Animals Two by Two Investigation 1, Part 1 Investigation 2, Part 1	Pages 6-11 Pages 12-15 Pages 9-12 Pages 10-16 Pages 9-13, Addendum Pages 1-4
2. Make scientific observations using the five senses, and distinguish between an object's observable properties and its name or its uses.	Fabric Investigation 1, Part 1 Investigation 1, Part 2 Investigation 1 Interdisciplinary Extension "Word & Fabric Cards" Investigation 2, Part 1 Wood and Paper Investigation 1, Parts 1 and 2 Investigation 3 Part 1 Trees Investigation 1, Part 3 and 4 Investigation 2, Part 2 Pebbles, Sand and Silt Investigation 1, Parts 1-2 Investigation 3, Part 1	Pages 6-11 Pages 12-15 Page 35 Pages 7-11 Pages 12-19 Pages 8-12 Pages 20-25 Pages 10-15 Pages 8-17 Pages 8-17
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).	Fabric Investigation 1, Part 2 Investigation 1, Part 3 Investigation 2, Part 1 Wood and Paper Investigation 1, Part 1 Investigation 3, Part 1 Trees Investigation 1, Part 3 and 4 Investigation 2, Part 2-5 Pebbles, Sand and Silt Investigation 1, Parts 3 and 4 Science Stories, "Exploring Rocks" Animals Two by Two Investigation 1, Part 4	Pages 12-15 Pages 16-19 Pages 7-11 Pages 12-15 Pages 8-12 Pages 20-25 Pages 10-25 Pages 18-25 SS Pages 3-7 TG Pages 2-3 Pages 10-16

<p>4. Use simple tools and nonstandard units to estimate or predict properties such as size, heaviness, magnetic attraction and float/sink.</p>	<p>Investigation 2, Part 4 Investigation 3, Part 3 Investigation 4, Part 2 <i>"Animals Two by Two" Book</i></p> <p>Fabric Investigation 1, Part 1</p> <p>Wood and Paper Investigation 1, Parts 1 and 2 Investigation 1 Parts 3, 4 and 5 Investigation 1, Math Extension</p> <p>Trees Investigation 1, Part 7 Investigation 1, Math Extension Investigation 2, Parts 2-6 Investigation 2, Math Extension</p> <p>Pebbles, Sand and Silt Investigation 2, Parts 1-3</p>	<p>Pages 22-24 Pages 17-20 Pages 12-15 Book</p> <p>Pages 6-11</p> <p>Pages 8-19 Pages 20-32 Page 34</p> <p>Pages 31-34</p> <p>Page 39 Pages 10-28</p> <p>Page 29</p> <p>Pages 8-23</p>
<p>5. Describe properties of materials such as wood, plastic, metal, cloth or paper and sort objects by the material from which they are made.</p>	<p>Wood and Paper Investigation 1, Part 3 Investigation 3, Parts 2-4 Investigation 3, Art Extension</p> <p>Fabric Investigation 1, Part 2 Investigation 1, Part 4 Investigation 1, Science Extension Investigation 2, Part 1 Investigation 2, Part 4</p>	<p>Pages 20-23 Pages 13-25 Page 27</p> <p>Pages 12-15 Pages 21-22</p> <p>Page 36 Pages 7-13 Pages 22-25</p>
<p>6. Count, order and sort objects by their observable properties</p>	<p>Fabric Investigation 1, Math Extension Investigation 2, Part 4</p> <p>Wood and Paper Investigation 1, Parts 4 and 5 Investigation 1, Science Extension Investigation 5, Math Extension</p> <p>Trees Investigation 1, Math Extension Investigation 2, Parts 2-4 Investigation 2, Math Extension Investigation 1, Home School Connection</p> <p>Pebbles, Sand and Silt Investigation 2, Math Extension A</p>	<p>Page 35</p> <p>Pages 22-25</p> <p>Pages 24-32</p> <p>Page 36</p> <p>Page 22</p> <p>Page 39 Pages 10-22</p> <p>Page 29 Page 40 Student Sheet #33</p> <p>TG Page 30 SS #16</p>

	Animals Two by Two Investigation 2, Part 4	Pages 22-24
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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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
1. Observe and describe differences between living and nonliving things in terms of growth, offspring and need for energy from “food.”	Animals Two by Two Investigation 1, Part 2 Investigation 5, Parts 1-3 Science Stories Trees Investigation 1, Part 2 Science Stories Plants and Animals Investigation 1, Parts 1 and 2 Video “How Plants Grow” Science Resources “What Do Plants Need” Investigation 3 Science Resources “What Do Animals Need” Insects and Plants Investigation 2, Part 1	Pages 17-21 Pages 10-24 Pages 3-24 Pages 15-19 Page 3 Pages 47-62 TG page 57 Pages 113-143 Pages 93-94
2. Sort and count living and nonliving things in the classroom, the schoolyard and in pictures.	Trees Investigation 2, Parts 2-4 Plants and Animals Investigation 3 Math Extension	Pages 10-22 Page 195
3. Use nonstandard measures to estimate and compare the height, length or weigh of different kinds of animals.	Trees Investigation 1, Part 7 New Plants Investigation 2, Part 3 Plants and Animals Investigation 1, Part 3 Investigation 2, Part 1 Investigation 3, Part 2 Animals Two by Two Investigation 3, Part 3 Investigation 3, Math Extension Insects and Plants Investigation 2 Parts 1-3	Pages 31-34 Pages 20-28 Pages 63-72 Pages 87-93 Pages 128-131 Pages 19-20 Page 21 Pages 91-115
4. Observe and write, speak or draw about similarities and differences between plants and animals.	Plants and Animals Investigation 3, Part 1 Investigation 3, Part 3 Insects and Plants Investigation 2, Part 1	Pages 120-127 Pages 135-140 Pages 93-94

<p>5. Match pictures or models of adults with their offspring (animals and plants).</p>	<p>Animals Two by Two Investigation 5, Parts 1-4 Investigation 5, Science Extension Science Stories FOSSWeb, Activity: Young and Adult Animals</p> <p>Plants and Animals Investigation 1, Part 2 Science Notebook #4</p> <p>Insects Investigation 1, Parts 2 and 3 Investigation 2, Parts 2 and 3 Investigation 3, Part 3 Investigation 4, Part 5 Investigation 5, Part 3</p> <p>Insects and Plants Investigation 1, Parts 2 and 3 Investigation 3, Part 3 Investigation 4, Part 5 Investigation 5, Part 3</p>	<p>Pages 10-27</p> <p>Page 28 Pages 20-23</p> <p>Pages 58-63 Page 176</p> <p>Pages 16-25 Pages 14-24 Pages 21-26 Pages 28-31 Pages 20-24</p> <p>Pages 62-75 Pages 145-151 Pages 187-191 Pages 219-225</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>Animals Two by Two Investigation 1, Part 4 Investigation 2, Parts 3 and 4 Investigation 3, Part 3 Investigation 4, Parts 1 and 2 Science Stories <i>“Animals Two by Two” Book</i></p> <p>Insects Science Stories, <i>“Variation”</i></p> <p>Insects and Plants Science Resources, <i>“Variation”</i> Science Resources, <i>“Same but Different”</i></p>	<p>Pages 26-29 Pages 18-23 Pages 19-20 Pages 8-15 Pages 2-24</p> <p>Pages 42-46</p> <p>Pages 20-25 Pages 35-26</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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
<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>2. Analyze weather data collected over time (during the</p>	<p>Air and Weather Investigation 2, Parts 1 and 2 Investigation 2, Part 4 Investigation 3, Part 2 Investigation 3, Part 4 Science Stories, <i>“What’s the Weather Today”</i></p> <p>Air and Weather</p>	<p>Pages 8-19 Pages 24-27 Pages 12-16 Pages 22-27 Pages 7-13</p>

day, from day to day, and from season to season) to identify patterns and make comparisons and predictions.	Investigation 1, Science Extensions Investigation 4, Parts 1 and 2 Science Stories, "Seasons"	Page 31 Pages 8-18 Pages 18-23
3. Observe, compare and contrast cloud shapes, sizes and colors, and relate the appearance of clouds to fair weather or precipitation.	Air and Weather Investigation 2, Part 3 Poster, "Guide to the Sky"	Pages 20-23
4. Write, speak or draw ways that weather influences humans, other animals and plants.	Air and Weather Investigation 4, Home/School Connection Plants and Animals Investigation 3, Parts 2 and 3 Science Resources, "Plants and Animals Around the World"	TG page 27, SS #44 Pages 128-140 TG Pages 132-134
5. Make judgments about appropriate clothing and activities based on weather conditions.	Air and Weather Investigation 4, Home/School Connection FOSSWeb Activity, "Dress the Bear"	TG page 27, SS #44 TG pages 4-5

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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
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).	Wood and Paper Investigation 1, Parts 1 and 2 Investigation 1, Social Studies Extension Science Stories, "The Story of a Chair" Science Stories, "The Story of a Box" Pebbles, Sand and Silt Investigation 3, Part 1 Investigation 3, Part 5 Investigation 3, Home School Connection Science Stories, "Making Things with Rocks"	Pages 8-19 Pages 34-35 Pages 3-8 Pages 13-18 Pages 8-11 Pages 24-29 TG Page 32 SS#23 Pages 14-17
2. Seek information in books, magazines and pictures that describes materials used to build shelters by people in	Pebbles, Sand and Silt Investigation 3, Science Extension	TG Page 32

different regions of the world.		
3. Compare and contrast the materials used by humans and animals to build shelters.	Wood and Paper Investigation 1, Social Studies Extension Science Stories	Pages 34-35 Pages 3-8

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:	FOSS 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).	Animals Two by Two Investigation 1, Part 3	Pages 22-25
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).	Balance and Motion Investigation 2 Science Stories, "Push or Pull?" Investigation 3, Part 1	Pages 1-25 Pages 10-13 Pages 6-12
3. Classify objects by the way they move (e.g., spinning, rolling, bouncing).	Balance and Motion Investigation 2, Part 1 Science Stories, "Things That Spin" Investigation 3, Part 1 Science Stories, "Rolling, Rolling, Rolling!" Home/School Connection	Pages 8-13 Pages 14-17 Pages 6-12 Pages 18-end TG Page 27, SS #21
4. Conduct simple experiments and evaluate different ways to change the speed and direction of an object's motion.	Balance and Motion Investigation 1, Parts 1-3 Investigation 3, Parts 2 and 3 FOSS Web Activity, "Roller Coasters"	Pages 1-25 Pages 13-25
5. Observe, record and predict the sun's position at different times of the day (morning, noon, afternoon or night).	*This is fully covered in the Grade 3-4 Module Sun, Moon and Stars , Investigation 1	Pages 33-71
6. Conduct simple investigations of shadows and analyze how shadows change as the relative position of the sun (or an artificial light source) changes).	Investigation 4, Part 2 *This is fully covered in the Grade 3-4 Module Sun, Moon and Stars , Investigation 1	Pages 12-18 Pages 33-71

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.*

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
1. Infer from direct observation and print or electronic information that most animals and plants need water, food and air to stay alive.	Insects Investigation 1, Part 1 Investigation 2, Part 1 Investigation 3, Part 2 Investigation 4, Part 2 Investigation 5, Part 1 Investigation 6, Parts 1-3 Science Stories Insects and Plants Investigation 1, Part 1 Investigation 3, Part 2 Investigation 4, Part 2 Investigation 5, Part 1 Science Resources Plants and Animals Science Resources	Pages 8-15 Pages 8-13 Pages 12-20 Pages 14-18 Pages 10-15 Pages 8-22 Pages 6-7 Pages 52-61 Pages 134-144 Pages 170-174 Pages 206-211 Pages 6-7 Pages 22-23, 29-30, 32-33, 35-36, 39, 41-45
	Animals Two by Two Investigation 1, Part 2 Investigation 2, Part 1 Investigation 3, Part 1 Investigation 4, Part 4	Pages 17-21 Pages 9-13 Pages 8-12 Pages 20-23
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.)	Insects Investigation 1, Parts 1-3 Investigation 2, Parts 1-3 Investigation 3, Part 3 Investigation 4, Parts 2-5 Investigation 5, Parts 1 and 3 Investigation 6, Parts 1-3 Science Stories Insects and Plants Investigation 1, 3-5, all parts Science Resources Animals Two by Two Investigation 1, Parts 1 and 3 Investigation 2, Parts 1 and 2 Investigation 3, Parts 1-3 Investigation 4, Parts 1 and 2	Pages 8-25 Pages 8-24 Pages 21-26 Pages 14-31 Pages 10-15, 20-23 Pages 8-22 Pages 4, 12-15, 26-27, 31 Pages 30-33
	Trees Investigation 1, Parts 1-7 Investigation 2, Parts 1-6 Investigation 3, Part 2	Pages 1—16, 22-26 Pages 9-17 Pages 8-20 Pages 8-15 Pages 7-34 Pages 6-31 Pages 12-14
3. Sort and classify plants (or plant parts) by observable characteristics (e.g., leaf shape/size, stem or trunk)		

covering, flower or fruit).	Investigation 3, Part 4 and 5	Pages 20-25
4. Use senses and simple measuring tools to measure the effects of water and sunlight on plant growth.	Trees Investigation 1, Part 7 Investigation 3, Part 9	Pages 31-34 Pages 37-38
	New Plants Investigation 1 Investigation 2, Part 3	Pages 8-30 Pages 20-28
5. Compare and contrast information about animals and plants found in fiction and nonfiction sources.	Animals Two by Two Investigation 1, Part 4 Reading Connections: Science Stories Book in module “A Fish Out of Water” “A Snail’s Spell”	Pages 26-29 TG Pages 1-16 Pages 4-24

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.*

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
1. Explain that living things experience a life cycle during which they undergo a predictable sequence of changes from birth, growth, reproduction and death.	Insects Investigation 1, Parts 1-3 Investigation 2, Parts 1-3 Investigation 3, Parts 1-3 Investigation 4, Parts 1-5 Investigation 5, Parts 1-3 Science Stories “ <i>Insect Live Cycles</i> ” **“ <i>Life Goes Around</i> ”	Pages 8-25 Pages 8-24 Pages 8-26 Pages 10-31 Pages 10-23 Pages 16-21 Pages 22-33
	Insects and Plants Investigations 1, 4, and 5, all parts Investigation 3, Parts 1-3 Science Resources “ <i>Insect Live Cycles</i> ” **“ <i>Life Goes Around</i> ”	Pages 45-79, 157-193, and 197-227 Pages 129-151 Pages 37-43 Pages 44-56
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).	Animals Two by Two Reading Connections: Book -“ <i>Chickens aren’t the Only Ones</i> ” Book -“ <i>Animals Two by Two</i> ”	TG Page 15
	Insects Science Stories, “ <i>Life Goes Around</i> ”	TG Pages 10-11, Pages 22-33

<p>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.</p>	<p>Insects Investigation 1, Parts 1-3 Investigation 2, Parts 1-3 Investigation 4, Parts 1-5 Investigation 5, Parts 1-3 Science Stories, <i>"Insect Live Cycles"</i> <i>**Life Goes Around"</i></p> <p>Insects and Plants Investigation 1, 4 and 5, all parts Investigation 3, Parts 1-3 Science Resources <i>"Insect Live Cycles"</i> <i>**Life Goes Around"</i></p>	<p>Pages 8-25 Pages 8-24 Pages 10-31 Pages 10-23</p> <p>Pages 16-20 Pages 22-33</p> <p>Pages 45-79, 157-193, and 197-227 Pages 129-151</p> <p>Pages 37-43 Pages 44-56</p>
<p>4. Analyze recorded observations to compare the metamorphosis stages of different animals, and make predictions based on observed patterns.</p>	<p>Insects Investigation I, Part 3 Math Extension Investigation 2, Part 3 Math Extension Science Extension, Timeline Investigation 3, Part 3 Science Extension, Timeline Investigation 4, Part 5 Science Extension, Timeline Investigation 4, Part 3 Science Extension, Timeline Science Stories, <i>"Insect Life Cycles"</i></p> <p>Insects and Plants Investigation 1, Part 3 Investigation 3, Part 3 Investigation 4, Part 5 Investigation 5, Part 3 Science Resources <i>"Insect Live Cycles"</i></p>	<p>Pages 22-25 Page 27 Pages 20-24 TG Page 26, SS #16 Page 27 Pages 21-26 Page 28 Pages 28-31 Page 32 Pages 20-24 Page 27 TG Pages 8-9, Pages 16-21</p> <p>Pages 71-76 Pages 145-152 Pages 187-192 Pages 219-225</p> <p>Pages 37-43</p>

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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
<p>1. Use nonstandard and standard measurements to describe and compare the weight, length and size of objects and organisms.</p>	<p>New Plants Investigation 1, Part 3 Investigation 2, Part 3 Investigation 3, Part 1</p> <p>Trees Investigation 1, Part 7 Investigation 3, Part 9</p> <p>Animals Two by Two</p>	<p>Pages 23-30 Pages 21-28 Pages 7-12</p> <p>Pages 31-34 Pages 37-38</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>Investigations 2 and 3 Math Extensions Plants and Animals Investigation 1, Part 3 Balance and Motion Investigation 1, Math Extension Pebbles, Sand and Silt Investigation 2, Parts 1 and 2</p> <p>Measurement (FOSS Module for Grade 3) Investigation 1, Part 1 and 2 Science Stories (Read to at first grade) “A Royal Measurement Mess”</p> <p>Air and Weather Investigation 2, Part 4 Measurement (FOSS Module for Grade 3) Investigation 1 (linear) Investigation 2 (weight) Investigation 3 (volume)</p> <p>Air and Weather Investigation 2, Part 4 New Plants Investigation 2, Part 3 Solids and Liquids Investigation 1, Math Extension Measurement (FOSS Module for Grade 3) Investigation 1</p> <p>Balance and Motion Investigation 1, Math Extension Measurement (FOSS Module for Grade 3) Investigation 2</p> <p>Measurement (FOSS Module for Grade 3) Investigation 3</p> <p>Measurement (FOSS Module for Grade 3) Investigation 4 Air and Weather Investigation 2, Part 2 FOSSWeb, “<i>Dress the Bear</i>”</p>	<p>Page 26, Page 21</p> <p>Pages 63-72</p> <p>Page 30</p> <p>Pages 8-17</p> <p>Pages 8-19</p> <p>Pages 1-4</p> <p>Pages 24-27</p> <p>Pages 1-28 Pages 1-24 Pages 1-24</p> <p>Pages 24-27</p> <p>Pages 20-28</p> <p>Page 27</p> <p>Pages 1-28</p> <p>Page 30</p> <p>Pages 1-24</p> <p>Pages 1-24</p> <p>Pages 1-24</p> <p>Pages 14-19</p>
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<p>8. Make graphs to identify patterns in recorded measurements such as growth or temperature over time</p>	<p>Air and Weather Investigation 2, Science Extension Investigation 4, Parts 1 and 2</p> <p>Plants and Animals Investigation 1, Part 3</p> <p>New Plants Investigation 1, Part 3 Investigation 2, Part 3</p> <p>Insects Investigation 1, Science Extension Timeline Investigation 2, Science Extension, Timeline Investigation 3, Science Extension, Timeline Investigation 4, Science Extension, Timeline Investigation 4, Science Extension, Timeline</p> <p>Solids and Liquids Investigation 2, Math Extension</p>	<p>Page 31</p> <p>Pages 8-18</p> <p>Pages 63-72</p> <p>Pages 23-30 Pages 21-28</p> <p>Page 27</p> <p>Page 27</p> <p>Page 28</p> <p>Page 32</p> <p>Page 27</p> <p>TG Page 28, SS #33</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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
1. Compare and contrast the properties that distinguish solids, liquids and gases.	Solids and Liquids Investigation 1, Part 1 Investigation 2, Part 1 and 3 Investigation 3, Part 1 Investigation 4 Part 3 FOSSWeb, "Change It" Science Stories, "Everything Matters" Air and Weather Investigation 1, Parts 1-4	Pages 8-16 Pages 10-14, 21-27 Pages 8-13 Pages 23-27 Pages 2-7, TG 1-4 Pages 1-26
2. Classify objects and materials according to their state of matter.	Solids and Liquids Science Stories, "Solids and Liquids" "Solids to Liquids and Back Again"	Pages 8-23, TG 5-7 Pages 14-17, TG 8-9
3. Measure and compare the sizes of different solids.	Solids and Liquids Investigation 3 Parts 1-4 Math Extension A Math Extension B	Pages 1-32 TG Pages 28-29, SS#35 TG Pages 28-29, SS #36
4. Measure and compare the volume of a liquid poured into different containers.	Solids and Liquids Investigation 2, Part 3 Math Extension A	Pages 21-23 TG Page 28, SS#33
5. Design a fair test to compare the flow rates of different liquids and granular solids.	Solids and Liquids Investigation 2, Part 1 (liquids flow rate) Investigation 3, Part 3 (granular solids)	Pages 10-14 Pages 19-23

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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
1. Use senses and simple tools	Plants and Animals Investigation 1	Pages 41-74

<p>to observe and describe the roots, stems, leaves, flowers and seeds of various plants (including trees, vegetables and grass.)</p>	<p>Science Resources, "The Story of Wheat" New Plants Investigation 1, Parts 1-3 Investigation 1, Science Extension Science Stories FOSSWeb, Activity: "Watch It Grow" Insects and Plants Investigation 2, Parts 1-3</p>	<p>TG Page 73-74, SR Pages 9-12 Pages 8-30 Page 32 Pages 12-18 Pages 91-115</p>
<p>2. Use magnifiers to observe and diagram the parts of a flower.</p>		
<p>3. Describe the functions of roots, stems, leaves, flowers and seeds in completing a plant's life cycle.</p>	<p>New Plants Investigations 1, 2, and 3 Insects and Plants Investigation 2, Parts 1-3</p>	<p>Pages 1-31, 1-32, and 1-26 Pages 91-115</p>
<p>4. Record observations and make conclusions about the sequence of stages in a flowering plant's life cycle.</p>	<p>Plants and Animals Investigation 1 Investigation 2 New Plants Science Stories, "Flowers and Seeds" Insects and Plants Investigation 2, Parts 1-3 Science Resources, "Flowers and Seeds"</p>	<p>Pages 41-74 Pages 81-108 TG Pages 6-7, SS Pages 12-15 Pages 91-115 Pages 15-19</p>
<p>5. Compare and contrast how seeds of different plants are adapted for dispersal by water, wind or animals.</p>	<p>Plants and Animals Investigation 2, Science Resources, "How Seeds Travel." <i>Science Notebook</i> New Plants Science Stories, "How Seeds Travel."</p>	<p>Pages 16-29, TG Pages 94-95 #7 Pages 8-11, TG Pages 4-5,</p>
<p>6. Conduct a fair test to explore factors that affect seed germination and plant growth.</p>	<p>New Plants Investigation 2, Part 2 Science Extensions</p>	<p>Pages 15-19 Page 30</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

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
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.	Pebbles, Sand, and Silt Investigation 2, Parts 1-4 Investigation 4, Parts 1-3	Pages 8-29 Pages 8-25
2. Classify soils by properties such as color, particle size (sand, silt or clay), or amount of organic material (loam).	Pebbles, Sand, and Silt Investigation 2, Parts 1-4 Science Stories, “ <i>The Story of Sand</i> ” Science Extensions Home/School Connection Investigation 4, Parts 1-3	Pages 8-29 Pages 8-11 Pages 31-32 TG Page 32, SS #22 Pages 8-25
3. Explain the importance of soil to plants, animals and people.	Pebbles, Sand, and Silt Investigation 3 Parts 1-5 (People) Science Stories, “ <i>Making Things with Rocks</i> ” Investigation 4, Parts 1-3 (Plants and Animals)	Pages 1-29 Pages 14-17 Pages 8-25
4. Evaluate the quality of different soils in terms of observable presence of air, water, living things and plant remains.	Pebbles, Sand, and Silt Investigation 4, Parts 2 and 3 Science Stories, “ <i>What’s In the Soil?</i> ”	Pages 15-25 Pages 15-25
5. Conduct fair tests to investigate how different soil types affect plant growth, and write conclusions supported by evidence.	Pebbles, Sand, and Silt Investigation 4, Science Extension Science Stories, “ <i>Testing Soil</i> ”	Page 27 Pages 22-23

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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
1. Explain that food is a source of carbohydrates, proteins and fats — nutrients that animals	Standards and GLE’s are specifically addressed in the	

<p>(including humans) convert to energy they use to stay alive and grow.</p> <p>2. Classify foods into groups based on their source, and relate common foods to the plant or animal from which they come.</p> <p>3. Give examples of ways people can improve soil quality and crop growth (e.g., irrigation, fertilizer, pest control).</p> <p>4. Compare and contrast how different cultures meet needs for basic nutrients by consuming various foods.</p> <p>5. Evaluate the nutritional value of different foods by analyzing package labels.</p>	<p>FOSS intermediate grade level module, *“Food and Nutrition” FOSSWeb Activity, “What’s for Dinner”</p> <p>Plants and Animals Investigation 1, Part 3 Home/School Connection Science Resources, <i>“The Story of Wheat”</i></p> <p>Food and Nutrition Science Stories, <i>“Eating Healthy International Style”</i></p> <p>Food and Nutrition Science Stories, <i>“Food Labels”</i></p>	<p>Pages 63-74 Page 77, TS #13 TG Pages 73-74, SR book Pages 9-15</p> <p>Pages 30-33</p> <p>Pages 27-29</p>
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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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
1. Compare and contrast the properties of solids, liquids and gases.	Matter and Energy Investigation 3, Part 1 Science Resources, “ <i>States of Matter</i> ”	Pages 129-138 Pages 39-42
2. Demonstrate that solids, liquids and gases are all forms of matter that take up space and have weight.	Matter and Energy Investigation 3, Parts 2 and 3 Science Extension	Pages 139-160 Page 161
3. Carry out simple tests to determine if materials dissolve, sink or float in water; conduct heat; or attract to magnets.	Earth Materials Investigation 1, Part 2 Magnetism and Electricity Investigation 1, Part 1 Solids and Liquids Investigation 4, Parts 1 and 2	Pages 16-23 Pages 8-17 Pages 7-22
4. Classify materials based on their observable properties, including state of matter.	Matter and Energy Investigation 3, Part 1 Science Resources, “ <i>States of Matter</i> ” Magnetism and Electricity Investigation 1, Part 1 Investigation 2, Part 3 Earth Materials Investigation 2, Parts 1 and 2 Science Stories	Pages 129-138 Pages 39-42 Pages 8-17 Pages 20-25 Pages 8-21 Pages 30-33
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.	Variables (5-6) Investigation 3, Math Extension Ideas and Inventions Investigation 3, Parts 1 and 2 Science Extensions Matter and Energy Investigation 3 Math Extension Science Resources, “ <i>Opinion and Evidence</i> ”	TG Page 30, SS #26 Pages 8-17 Page 24 Page 161, TS #19 SR Pages 43-46
6. Explain the role of heating and cooling in changing matter from one state to another	Water Investigation 2, Part 3	Pages 19-24

during freezing, melting, evaporation and condensation.	Investigation 2, Science Extension Investigation 3, Parts 1-4 Science Stories, “ <i>Ice is Everywhere</i> ” “ <i>Evaporation and Condensation</i> ” FOSSWeb, Activity: “Evaporation” Matter and Energy Investigation 4, Parts 1 and 2 Science Resources, “ <i>Change of State</i> ” Science Notebook, “ <i>Melting</i> ”	Page 27 Pages 8-26 Pages 8-11 13-16 Pages 174-192 TG Page 191, SR Pages 54-56 SN Page #21
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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.*

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
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.	Structures of Life Investigation 2 (Plants) Parts 1-3 Investigation 3 (Animals), Parts 1 and 2 Investigation 4, Parts 1 and 2 Investigation 5, Parts 1 and 2 Science Stories , “Hydro-Growing”	Pages 8-22 Pages 8-19 Pages 8-19 Pages 8-18 TG Pages 8-9, Pages 10-11
2. Explain how behaviors such as hibernation, dormancy and migration give species advantages for surviving unfavorable environmental conditions.	Structures of Life Investigation 1, Part 2 Science Stories, “ <i>A Change in the Environment</i> ”	Pages 18-27 TG Page 18-19, Pages 35-36
3. Give examples of ways animals benefit from camouflage.	Insects and Plants Science Resources, “ <i>Insect Shapes and Colors</i> ”	Pages 26-19
4. Evaluate whether an adaptation gives a plant or animal a survival advantage in a given environment.	Structures of Life Science Stories, “ <i>Life on Earth</i> ”	TG Pages 16-17, Pages 22-43 TG Pages 2-3, Pages 1-3 TG Pages 14-15, Pages 2021
5. Design a model of an organism whose adaptations give it an advantage in a specific environment.	“ <i>Seeds are Everywhere</i> ” “ <i>Life Cycle of a Crayfish</i> ”	

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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
1. Differentiate between rocks and minerals.	Earth Materials Investigation 1, Parts 2 and 3 Investigation 2, Part 1 Investigation 3, Part 1 Investigation 4, Part 1 Science Stories, “ <i>Digging it Up: Mining for Minerals</i> ” Science Stories, “ <i>A Mineral for Each Month</i> ” Science Stories, “ <i>Identifying Minerals</i> ” FOSSWeb Activity, “ <i>Rock Database</i> ”	Pages 16-29 Pages 8-14 Pages 8-13 Pages 8-13 Pages 12-13 Pages 14-15 Pages 30-33
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).	Earth Materials Investigation 1, Parts 1 and 2 Investigation 2, Part 1	Pages 8-23 Pages 8-12
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.	Earth Materials Investigation 2, Parts 1 and 2 Investigation 3, Part 1 Investigation 4, Parts 1 and 2	Pages 8-21 Pages 8-13 Pages 8-18
4. Summarize nonfiction text to compare and contrast the conditions under which igneous, metamorphic and sedimentary rocks are formed.	Earth Materials Science Stories, “ <i>Where Do Rocks Come From?</i> ” “ <i>Written in Stone</i> ” “ <i>Postcards From the Ledge</i> ”	Pages 34-37 Pages 1-44 Pages 5-7
5. Observe and analyze rock properties (e.g., crystal size or layers) to infer the conditions under which the rock was formed.	Earth Materials Investigation 1, Part 3 Science Stories, “ <i>Where Do Rocks Come From?</i> ”	Pages 24-29 Pages 34-37
6. Evaluate the usefulness of different rock types for specific applications (e.g., buildings, sidewalks, stone walls, statues or monuments).	Earth Materials <i>Investigation 4</i> Science Stories, “ <i>Treasure Underfoot</i> ” “ <i>Rock of Ages</i> ”	Pages 8-9 Pages 24-29

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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
<p>1. Describe ways people use earth materials, such as fossil fuels, trees, water, soils and rocks as natural resources to improve their lives.</p> <p>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).</p> <p>3. Explain advantages and disadvantages of renewable and nonrenewable energy sources that can be used for making electricity, fueling cars or heating homes.</p> <p>4. Design and conduct experiments to evaluate the effectiveness of different insulating materials for keeping a substance warm or cold (i.e., conducting heat).</p> <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>6. Distinguish among reducing, reusing, recycling and replacing as conservation techniques.</p>	<p>Matter and Energy Investigation 1 Science Resources, “<i>Energy Sources</i>” Science Resources, “<i>Energy Conversion</i>”</p> <p>Water Investigation 4, Parts 1 and 3</p>	<p>Pages 50-79</p> <p>Pages 1-7</p> <p>Pages 8-13</p> <p>Pages 8-13, 19-23</p>
	<p>Matter and Energy Science Resources, “<i>Energy Conversion</i>,”</p> <p>Water Science Stories, “<i>Water a Vital Resource</i>”</p>	<p>Pages 8-13</p> <p>Pages 17-18</p>
	<p>Matter and Energy Investigation 1, Home/School Connection, “<i>Energy</i>”</p>	<p>TG Page 84, TS #21</p>
	<p>Solar Energy (5-6) Investigation 4, Solar Houses</p>	<p>Pages 1-33</p>
	<p>Matter and Energy Investigation 1, Home/School Connection, “<i>Energy</i>”</p> <p>Water Investigation 3, Language Extension Investigation 4. Math Extension, Problem of the Week</p>	<p>TG Page 84, TS #21</p> <p>Page 27</p> <p>TG Page 30-31, SS #30</p>
	<p>Water Investigation 3, Language Extension Science Stories, “<i>Water Conservation</i>.”</p>	<p>Page 27</p> <p>Page 21</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:	FOSS Investigations	Page(s)
<p>1. Demonstrate that a force can cause an object to start moving, stop, or change speed or direction</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>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>4. Describe how friction forces caused by air resistance or interactions between surface materials affect the motion of objects.</p> <p>5. Predict the effect of an object's mass on its motion.</p>	<p>4.1 GLE's are also addressed in FOSS Levers and Pulleys at grade 5/6</p> <p>Water Investigation 4, Part 2</p> <p>Variables (5-6) Investigation 1, Parts 1-3 Investigation 3, Parts 1-4 Investigation 4, Parts 1-3</p> <p>Human Body Investigation 3, Parts 1-3</p> <p>Variables (5-6) Investigation 3, Parts 1-4 Language Extension, "Write a Flight Plan" Science Extensions: <i>Investigate with Toys</i> <i>Launch Balloon Rockets</i> Investigation 4, Parts 1-3</p> <p>Water Investigation 4, Part 2</p> <p>Levers and Pulleys Investigation 1, Part 1</p> <p>Variables (5-6) Investigation 1, Part 2 Investigation 4, Part 2</p> <p>* Air resistance is investigated at Grade 1 in FOSS modules Balance and Motion and Air and Weather</p> <p>Water Investigation 4, Part 2</p> <p>Variables (5-6) Investigation 4, Home/School Connection</p> <p>Water Investigation 4, Part 2</p>	<p>Pages 14-18</p> <p>Pages 8-27 Pages 8-27 Pages 8-28</p> <p>Pages 8-21</p> <p>Pages 8-27</p> <p>Page 29</p> <p>Page 32 Page 32 Pages 8-28</p> <p>Pages 14-18</p> <p>Pages 8-17</p> <p>Pages 16-22 Pages 12-17</p> <p>Pages 14-18</p> <p>SS #30</p> <p>Pages 14-18</p>

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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
1. Give examples of ways that living and nonliving things are interdependent within an ecosystem.	Plants and Animals Investigation 3, Parts 1-3 Science Extensions Science Stories, “ <i>What Do Animals Need?</i> ”	Pages 120-140 Pages 142-143 TG Page 127, Pages 21-27
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.	Matter and Energy Science Resources, “ <i>Energy Sources</i> ”	Pages 1-7
3. Design and conduct simple investigations to record interactions among producers, consumers, herbivores, carnivores, omnivores and decomposers in an ecosystem.	Matter and Energy Science Resources, “ <i>Food is Fuel</i> ”	Pages 4-5
4. Analyze food webs to describe how energy is transferred from plants to various animals in an ecosystem.	Plants and Animals Investigation 3, Parts 1-3 Science Extensions	Pages 120-140 Pages 142-143
5. Distinguish between naturally occurring changes in ecosystems and those caused by human activity.	Structures of Life Science Stories, “ <i>The Food Web</i> ”	Page 43
6. Predict the effect an environmental change, such as drought or forest destruction, might have on the community of living things.	Structures of Life Science Stories, “ <i>A Change in the Environment</i> ”	TG Pages 18-19, Pages 35-36

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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
1. Describe the role of the sun’s energy (i.e., heating and	Water	

<p>cooling) in the continuous cycling of water between the earth and the atmosphere through evaporation, condensation and precipitation.</p>	<p>Investigation 3, Parts 1-4 Science Stories, <i>"The Water Cycle"</i> FOSSWeb, Pictures: Water Cycle</p>	<p>Pages 8-26 Pages 14-16</p>
<p>2. Use models to demonstrate that topography causes precipitation landing on earth to move in streams and rivers from higher to lower elevations.</p>	<p>Water Science Stories <i>"The Water Cycle"</i>, FOSSWeb, Pictures: Water Cycle</p>	<p>Pages 14-16</p>
<p>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.</p>	<p>*Landforms Investigation 2, Parts 1 and 2 Investigation 3, Part 1 Investigation 4, Parts 1-3 Investigation 5, Parts 1-3</p>	<p>Pages 8-22 Pages 8-14 Pages 8-24 Pages 8-26</p>
<p>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).</p>	<p>*Landforms Investigation 2, Parts 1 and 2 Investigation 4, Part 3 Science Stories, <i>"Shapes of the Earth"</i></p>	<p>Pages 8-22 Pages 21-24 TG Pages 8-9, Pages 22-29</p>
<p>5. Present evidence to support a scientific claim about the relationship between the amount and speed of moving water and the size of earth materials moved (e.g., silt, pebbles, boulders).</p>	<p>*Landforms Investigation 2, Parts 1 and 2 Math Extension, "Stream Tables" Investigation 3, Part 2 Math Extension, <i>"Go With the Flow"</i> Science Stories, <i>"Rivers and Controlling the Flow"</i></p>	<p>Pages 8-22 Page 27</p>
<p></p>	<p>Investigation 3, Parts 1-3</p>	<p>Pages 8-24</p>
<p></p>	<p>*Landforms Investigation 2, Parts 1 and 2 Math Extension, "Stream Tables" Investigation 3, Part 2 Math Extension, <i>"Go With the Flow"</i> Science Stories, <i>"Rivers and Controlling the Flow"</i></p>	<p>Pages 8-22 TG Pages 23-24, SS #30 Pages 15-19 TG Pages 26-27, SS #31 TG Pages 6-7, Pages 15-21</p>
<p></p>	<p>*Note: Landforms is a FOSS module suggested for Grade 5</p>	<p></p>

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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
1. Construct complete (closed) and incomplete (open) series circuits in which electrical energy is transformed into heat, light, sound and/or motion energy.	Magnetism and Electricity Investigation 2, Parts 1-4 Investigation 3, Part 1 Science Extensions Matter and Energy Investigation 1, Part 1 Science Resources, <i>“Batteries”</i>	Pages 8-29 Pages 8-15 Pages 27-28 Pages 50-62 Pages 6-7
2. Draw labeled diagrams of complete and incomplete circuits and explain necessary components and how components must be arranged to make a complete circuit.	Magnetism and Electricity Investigation 2, Parts 1 and 2 Investigation 3, Parts 1 and 2	Pages 8-19 Pages 8-21
3. Predict whether diagrammed circuit configurations will light a bulb.	Magnetism and Electricity Investigation 2, Parts 1 and 2 Student Sheet, <i>“Making Connections”</i> Response Sheet, <i>“Bulbs”</i> Response Sheet, <i>“Circuit Design”</i>	Pages 8-19 SS #12 SS #9 SS #16
4. Develop a method for testing conductivity, and analyze data to generalize about which materials are good electrical conductors and which are good insulators.	Magnetism and Electricity Investigation 2, Part 3 Language Extension, <i>“Name That Insulator..Name That Conductor”</i>	Pages 20-25 Page 30
5. Observe magnetic effects associated with electricity and investigate factors that affect the strength of an electromagnet.	Magnetism and Electricity Investigation 4, Parts 1-3 Investigation 5, Part 1 FOSSWeb Activity, <i>“Electromagnets”</i> Science Stories, <i>“How Electromagnetism Stopped a War”</i> <i>“Magnets and Electricity in Your Life”</i>	Pages 8-22 Pages 8-14 Pages 24-27 Pages 28-33
6. Describe materials that are attracted by magnets.	Magnetism and Electricity Investigation 1, Part 1 and 4 Science Stories, <i>“Magnus Gets Stuck”</i>	Pages 8-17, 30-34 Pages 1-4

<p>7. Design procedures to move objects and separate mixtures of solids using magnets.</p>	<p>Magnetism and Electricity Investigation 1, Parts 2 and 3 FOSSWeb Activity, <i>"Electromagnets"</i></p>	<p>Pages 18-29</p>
<p>8. Investigate how magnets react with other magnets and analyze findings to identify patterns in the interactions between north and south poles of magnets.</p>	<p>Magnetism and Electricity Investigation 1, Parts 1-3 Science Stories, <i>"Making Static"</i></p>	<p>Pages 8 -29 Pages 10-11</p>
<p>9. Give examples of uses of magnets (e.g., motors, generators, household devices).</p>	<p>Magnetism and Electricity Investigation 1 Science Stories, <i>"Make a Compass"</i> <i>"Magnets and Electricity in Your Life"</i> Home School Connection, <i>"The Force"</i> FOSSWeb Activity, <i>"Kitchen Magnets"</i></p>	<p>Pages 7-9 Pages 28-33 Page 36, SS #34</p>

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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
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).	<p>*Physics of Sound Investigation 1, Part 3 Investigation 2, Parts 1-3 Investigation 3, Parts 1 and 2 Home/School Connection, <i>“How Sound Travels”</i> Science Stories, <i>“Seeing’ the World Through Sound”</i> <i>“Listen To This”</i></p> <p>*Matter and Energy Investigation 1, Part 3 Science Resources, <i>“Energy on the Move”</i></p>	<p>Pages 21-29 Pages 8-24 Pages 8-23 SS #35 Pages 1-4 Pages 5-6 Pages 71-82 Page 14-17</p>
2. Demonstrate how the loudness, pitch and quality/timbre of sound can be varied.	<p>*Physics of Sound Investigation 2, Parts 1-3 Home/School Connection, <i>“Good Vibrations”</i> Science Stories, <i>“Highs and Lows”</i> Investigation 4, Part 1</p>	<p>Pages 8-24 SS #34 Pages 8-13 Pages 11-13 Pages 8-13</p>
3. Design and conduct investigations to determine factors that affect pitch.	<p>*Physics of Sound Investigation 2, Parts 1-3 Investigation 4, Part 1</p>	<p>Pages 8-24 Pages 8-13</p>
4. Describe the properties of materials that reflect or absorb sound.	<p>*Physics of Sound Investigation 3, Parts 1 and 2 Science Extension, <i>“Compare Sound Mufflers”</i> and <i>“Make an Air Cannon”</i> Home/School Connection, <i>“How Sound Travels”</i> Investigation 4, Part 1 Science Stories, <i>“Moving Along”</i></p>	<p>Pages 8-23 Page 23 SS #35 Pages 8-13 Pages 19-21</p>
5. Construct simple musical instruments (e.g., rubber band guitars, drums, etc.) that produce sounds with various pitches, volume and timbres.	<p>*Physics of Sound Investigation 2, Parts 2 and 3 Music Extensions Science Extensions, <i>“Make a Duck Flute”</i> and <i>“Rubber-Band Guitars”</i></p>	<p>Pages 12-24 Page 27 Page 28</p>

	Science Stories, "Sound Off" *FOSS Physics of Sound and Matter and Energy are fourth grade units appropriate to 5 th grade student GLE's and matched to standards	Pages 15-16
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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.*

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
1. Provide evidence that light travels in straight lines away from a source in all directions.	*Matter and Energy Investigation 2, Part 1 Video "All About Light"	Pages 93-102 TG Page 111, Notebook #12
2. Investigate how light is refracted as it passes through a lens or through one transparent material to another.		
3. Demonstrate that white light is composed of many colors.	*Matter and Energy Investigation 2, Part 2 Video "All About Light" Science Resources, "Throw a Little Light on Sight"	Pages 103-114 TG Page 111, Notebook #12 Pages 29-33
4. Explain that all visible objects are reflecting some light to the human eye.	*Matter and Energy Investigation 2, Part 2 Video "All About Light" Science Resources, "Reflection" "Throw a Little Light on Sight"	Pages 103-114 TG Page 111, Notebook #12 Pages 24-28 Pages 29-33
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.	*Matter and Energy Investigation 2, Parts 1 and 2 Video "All About Light" Science Resources, "Reflection" *Ideas and Inventions Investigation 4, Parts 1-4 Science Stories, "Making Mirrors" "Light and Reflection"	Pages 93-114 TG Page 111, Notebook #12 Pages 24-28 Pages 8-25 TG Pages 22-23, Page 32 TG Pages 20-21, Pages 28-31
6. Measure angles to predict the path of light reflected by a	*Matter and Energy Investigation 2, Part 1 Science Resources,	Pages 93-102

<p>mirror.</p> <p>7. Determine whether a material is opaque, transparent or translucent based on how light passes through it.</p> <p>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.</p>	<p><i>“Reflection</i></p> <p>Covered in FOSS Solids and Liquids at Grades 1/2</p> <p>Solar Energy Investigation 1, Parts 1 and 2 Science Stories, <i>“The Sun and Shadows”</i> <i>“Building Time Devices”</i></p> <p>*Matter and Energy Investigation 2, Part 2 Video <i>“All About Light”</i></p> <p>*Ideas and Inventions Investigation 4, Parts 1-4 Science Stories, <i>“Into the Shadows”</i></p> <p>* FOSS Matter and Energy and Ideas and Inventions are fourth grade units appropriate to 5th grade student GLE’s and matched to standards</p>	<p>Pages 24-28</p> <p>Pages 8-21</p> <p>Pages 1-9 Pages 10-11</p> <p>Pages 103-114 TG Page 111, Notebook #12</p> <p>Pages 8-25 TG Pages 18-19, Pages 26-27</p>
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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.*

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
<p>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.</p> <p>2. Pose testable questions and design experiments to explore factors that affect human reaction time.</p> <p>3. Conduct simple tests to explore the capabilities of the human senses.</p>	<p>*Human Body Investigation 4, Part 1 Physics of Sound, Science Stories, “Your Source and Receiver” “Grandmothers Hearing Test”</p> <p>*Human Body Investigation 4, Parts 1-3 Math Extension, “<i>Compare Graphs</i>” Science Extension, “<i>Investigate Other Stimuli</i>”</p> <p>*Human Body Investigation 4, Parts 1-3 Math Extension, “<i>Compare</i></p>	<p>Pages 8-16</p> <p>Pages 9-10 Pages 32-35</p> <p>Pages 8-24</p> <p>Page 31</p> <p>Page 32</p> <p>Pages 8-24</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><i>Graphs</i> Science Extension, <i>"Investigate Other Stimuli"</i></p> <p>*Physics of Sound Investigation 1, Part 1 Investigation 3, Parts 1 and 2 <i>Home/ School Connection</i></p>	<p>Page 31</p> <p>Page 32</p> <p>Pages 8-15 Pages 8-19 TG Page 24, SS #35</p>
	<p>*Physics of Sound, Science Stories, <i>"Your Source and Receiver"</i> <i>"Grandmothers Hearing Test"</i></p>	<p>Pages 9-10 Pages 32-35</p>
	<p>*Physics of Sound Science Stories, <i>"Your Source and Receiver"</i> <i>"Grandmothers Hearing Test"</i></p>	<p>Pages 9-10 Pages 32-35</p>
	<p>*Matter and Energy Investigation 2, Part 1 Science Resources, <i>"Reflection"</i></p> <p>Ideas and Inventions Investigation 4, Parts 1 and 2</p>	<p>Pages 93-101</p> <p>Pages 24-28</p> <p>Pages 8-17</p>
	<p>*Matter and Energy Investigation 2, Part 2 Video <i>"All About Light"</i> Science Resources, <i>"Throw a Little Light on Sight"</i></p>	<p>Pages 103-114 TG Page 111, Notebook #12 Pages 29-33</p>
	<p>*FOSS Human Body, Physics of Sound and Ideas and Inventions are Grade 4 Modules that match the Connecticut GLE's at Grade 5 as indicated above</p> <p>**Human Brain and Senses is a grade 6 Course that matches ALL CT. grade 5 GLE's</p>	

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.*

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
<p>1. Explain the motion of the Earth relative to the sun that causes Earth to experience cycles of day and night.</p>	<p>Sun, Moon and Stars Investigation 1, Parts 1 and 2 Science Resources. <i>"Sunrise and Sunset"</i></p>	<p>Pages 42-67</p> <p>Pages 1-3</p>

<p>2. Construct models 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>3. Distinguish between the sun as a source of light and the moon as a reflection of that light.</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>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><i>"Changing Shadows"</i></p> <p>Sun, Moon and Stars Investigation 2, Part 2 Science Resources, <i>"Changing Moon"</i></p>	<p>Pages 4-8</p> <p>Pages 89-98</p> <p>Pages 19-32</p>
	<p>Sun, Moon and Stars Investigation 2, Part 2 Science Resources, <i>"Changing Moon"</i> Video, "All About the Moon"</p>	<p>Pages 89-100</p> <p>Pages 19-32</p>
	<p>Sun, Moon and Stars Investigation 2, Parts 1 and 2 Science Resources, <i>"Changing Moon"</i> Video, "All About the Moon"</p>	<p>Pages 79-100</p> <p>Pages 19-32</p>
	<p>Sun, Moon and Stars Investigation 2, Parts 1 and 2 Science Resources, <i>"Changing Moon"</i> Video, "All About the Moon"</p>	<p>Pages 79-100</p> <p>Pages 19-32</p>
	<p>Sun, Moon and Stars is a FOSS module targeted to meet these standards and GLE's. This module was designed at the fourth grade level but is appropriate to Grade 5.</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.*

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
<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>Ideas and Inventions Investigation 4, Parts 2 and 3 (build a periscope, build a kaleidoscope)</p>	<p>Pages 14-21</p>
	<p>Science Stories, "Light and Reflection" "Making Mirrors"</p>	<p>Pages 28-31</p> <p>Page 32</p>
	<p>Sun, Moon and Stars Investigation 3, Part 2 (telescopes)</p>	<p>Pages 127-132</p>
	<p>Science Resources, "Looking through Telescopes"</p>	<p>Pages 40-43</p>

<p>2. Construct simple periscopes and telescopes, and analyze how the placement of their 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>	<p>Ideas and Inventions Investigation 4, Parts 2 and 3 (build a periscope, build a kaleidoscope) Science Stories, "Light and Reflection" "Making Mirrors"</p> <p>Matter and Energy Investigation 2 Science Extension, "<i>Make a Periscope</i>"</p> <p>Matter and Energy Investigation 2, Part 1</p> <p>Ideas and Inventions Investigation 4, Parts 1 and 2</p> <p>Covered in FOSS Middle Level Module Human Brain and Senses</p> <p>Covered in FOSS Middle Level Module Human Brain and Senses</p>	<p>Pages 14-21</p> <p>Pages 28-31 Page 32</p> <p>Page 117</p> <p>Pages 93-102</p> <p>Pages 8-17</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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
1. Describe the structure of the atom and its component parts.	Chemical Interactions Science Resources, “New Technologies”	Pages 80-83
2. Explain that density (mass/volume) is a characteristic property that can be used to identify an element or substance.	Chemical Interactions Investigation 3, Part 2 Science Resources, “Particles in Motion” Weather and Water Investigation 5, Part 1 Science Resources, “Density” Planetary Science Investigation 8, Parts 3 and 4	Pages 99-107 Pages 23-27 Pages 152-162 Pages 27-31 Pages 260-270
3. Compare and contrast the properties of a metal (aluminum, iron, etc.) with a nonmetal (oxygen, carbon, etc.)	Chemical Interactions Investigation 2, Parts 1 and 2 Science Resources, “Elements” “Elements in the Universe” FOSSWeb: <i>Interactive Periodic Table and Element ID Games</i>	Pages 70-81 Pages 3-8 Pages 914
4. Illustrate the differences in the physical and chemical properties of a molecule and the individual atoms that bonded to form that molecule.	Chemical Interactions Investigation 1, Parts 1 and 2 Science Resources, “Elements” Investigation 8, Parts 1 and 2 Investigation 9, Parts 1-4 Investigation 10, Parts 1-2 Science Resources “How Do Atoms Rearrange” “Atoms and Compounds” Mixtures and Solutions Science Stories. “What is Matter Made Of”	Pages 41-58 Pages 3-8 Pages 248-268 Pages 280-312 Pages 323-335 Pages 63-68 Page 96 Pages 25-29
5. Differentiate between a mixture and an element or	Chemical Interactions Investigation 2, Parts 1 and 2	Pages 70-81

<p>compound and identify examples.</p> <p>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.</p> <p>7. Use the patterns in the Periodic Table to locate metals, semimetals and nonmetals and to predict the general characteristics of an element.</p>	<p>Investigation 9, Parts 1-4 Science Resources "How Do Atoms Rearrange" "Atoms and Compounds" Mixtures and Solutions Science Stories, "Mixtures and Solutions" "A Salty Story" "Earth Elements" "What is Matter Made Of" "The Periodic Table"</p> <p>Chemical Interactions Investigation 1, Parts 1 and 2 Investigation 8, Part 1 Mixtures and Solutions Investigation 1, Parts 1-4 Investigation 2, Parts 1-3 FOSSWeb, Activity: <i>Junkyard Analysis</i></p> <p>Chemical Interactions Investigation 2, Parts 1 and 2 Science Resources "The First Periodic Table" "The Modern Periodic Table" "Element Finders" FOSSWeb: <i>Interactive Periodic Table and Element ID Games</i> Mixtures and Solutions Science Stories, "The Periodic Table" "The Metals"</p>	<p>Pages 280-312 Pages 63-68 Page 96 Page 1-6 Pages 7-10 Page 11-12 Pages 25-29 Pages 32-36 Pages 41-58 Pages 248-255 Pages 8-29 Pages 8-25 Pages 70-81 Pages 4-5 Pages 5-6 Pages 7-8 Pages 32-36 Pages 37-42</p>
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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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
<p>1. Analyze and interpret how biotic and abiotic factors interact within a given ecosystem.</p>	<p>Populations and Ecosystems Investigation 2, Parts 1 and 2 Investigation 3, Parts 1-3 Investigation 4, Parts 1 and 2 FOSSWeb <i>Ecoscenerios: Biotic and Abiotic Data</i></p>	<p>Pages 70-79 Pages 90-108 Pages 119-129</p>
<p>2. Design and conduct a scientific investigation to</p>	<p>Environments Investigation 3, Parts 1-3</p>	<p>Pages 8-22</p>

<p>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>6. Compare and contrast how energy and matter flow in a Connecticut ecosystem, emphasizing the interactions among producers, consumers and decomposers.</p> <p>7. Identify local examples of predator-prey relationships and justify the impact of each type of population on the other.</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>10. Explain the impact of environmental conditions such as climate, elevation,</p>	<p>Populations and Ecosystems Investigation 5, Parts 1 and 2 Resources, “<i>Where Does Food Come From?</i>”</p> <p>Populations and Ecosystems Investigation 5, Parts 2 and 4 Resources, “<i>Where Does Food Come From?</i>”</p> <p>Populations and Ecosystems Investigation 4, Parts 1 and 2 Investigation 7 FOSSWeb “<i>Ecoscenerios: Abiotic Data</i>” Resources, “Limiting Factors” and “Mono Lake”</p> <p>Populations and Ecosystems Investigation 3, Extending the Experience, “<i>Localize Your Mini-Ecosystems</i>” Investigation 7</p> <p>Populations and Ecosystems Investigation 6, Parts 1-3 Investigation 7 Extending the Experience, “<i>Investigate Local Ecosystem Issues</i>”</p> <p>Populations and Ecosystems Investigation 6, Parts 2-3 Investigation 8, Part 2 FOSSWeb, “<i>Walkingstick Predation</i>” simulation and graphing.</p> <p>Populations and Ecosystems Investigation 4, Parts 1 and 2 Investigation 7 FOSSWeb <i>Ecoscenerios: Food Webs</i></p> <p>Populations and Ecosystems Investigation 4, Parts 1 and 2</p>	<p>Pages 142-156</p> <p>Pages 14-16</p> <p>Pages 153-155, 161-170</p> <p>Pages 14-16</p> <p>Pages 119-129 Pages 210-217</p> <p>Pages 22-24, 25-29</p> <p>Page 108</p> <p>Pages 210-217</p> <p>Pages 179-198 Pages 210-217</p> <p>Page 218</p> <p>Pages 187-198 Pages 234-243</p> <p>Pages 119-129 Pages 210-217</p> <p>Pages 119-129</p>
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topography or water quality on food chains.	Investigation 6, Parts 1-3 Investigation 7 Investigation 8, Part 1 Environments Science Stories, “ <i>Terrestrial Environments Around the World</i> ” “ <i>Water Pollution: The Lake Erie Story</i> ”	Pages 179-198 Pages 210-217 Pages 228-233 Pages 9-17 Page 36
11. Predict what will happen to a population based on current trends (fires, disease, overhunting, development) and defend the prediction.	Populations and Ecosystems Investigation 7 FOSSWeb, “ <i>Ecoscenerios: Issues:</i> ”	Pages 210-217

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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
1. Compare the composition and structure of the Earth’s atmospheric layers.	Weather and Water Investigation 2, Part 2 FOSSWeb, “ <i>Atmospheric Data</i> ” and “ <i>Elevator to Space</i> ” Science Resources, “ <i>What’s in the Air</i> ” “ <i>A Thin Blue Veil</i> ”	Pages 76-80 Pages 6-7 Pages 8-11
2. Demonstrate how changes in temperature, pressure, moisture and density of air affect weather patterns (e.g., air masses and air pressure.)	Weather and Water Investigation 4, Parts 1 and 2 Investigation 5, Parts 1-3 Investigation 6, Parts 1-5 Extending the Experience, “ <i>Take a Second Look at Pressure/Temperature Relationship</i> ” Investigation 8, Parts 1-4 Investigation 9, Parts 1-4	Pages 121-140 Pages 152-174 Pages 190-220 Page 221 Pages 258-279 Pages 297-318
3. Describe in writing how solar energy drives Earth’s weather systems.	Weather and Water Investigation 2, Parts 1-3 Investigation 4, Parts 1 and 2 FOSSWeb, “ <i>Heat Capacity Simulation</i> ” Investigation 9, Parts 1-4 FOSSWeb, “ <i>Solar Balloon</i> ” Water Planet Investigation 3 Parts 1 and 2	Pages 93-110 Pages 121-140 TG Page 140 Pages 297-318 Pages 125-144
4. Investigate and report on	Weather and Water	

<p>how the introduction of heat affects the motion of particles and the distance between them.</p>	<p>Investigation 4, Parts 1 and 2 Science Resources, <i>“Heating the Atmosphere”</i> FOSSWeb, Matter and Energy: Molecules in Solids, Liquids and Gases Chemical Interactions Investigation 4, Parts 1-3 Investigation 7, Parts 2-5 Science Resources, “Particles in Motion” “Expansion and Contraction” “Energy on the Move” “Rock Solid”</p>	<p>Pages 121-139 Pages 23-26 Pages 122-142 Pages 210-234 Pages 24-31, 46-48 Pages 23-27 Pages 28-31 Pages 32-37 Pages 42-48</p>
<p>5. Illustrate the transfer of energy as matter changes phase.</p>	<p>Chemical Interactions Investigation 7, Parts 1-5 FOSSWeb, <i>“Particles in Solid, Liquid, and Gas”</i> Science Resources, <i>“Rock Solid”</i></p>	<p>Pages 204-234 Pages 42-48</p>
<p>6. Design, conduct and report in writing an investigation that reveals different substances absorb and release heat at different rates.</p>	<p>Weather and Water Investigation 4, Parts 1 and 2 Lab Notebook, “Earth Material Temperatures” “Heat Conduction” “Conduction Through Materials” Science Resources, “Heating the Atmosphere” Water Planet Investigation 4, Part 1 Science Resources, <i>“Uneven Heating”</i> Solar Energy Investigation 2, Parts 1 and 2 Science Stories, <i>“Differential Heating”</i> Investigation 3, Part 1 Investigation 4, Parts 1-3</p>	<p>Pages 122-141 LN Pages 14-15 LN Page 17 LN Page 19 Pages 22-26 Pages 125-135 Pages 42-45 Pages 8-24 Pages Pages 8-16 Pages 8-28</p>
<p>7. Research and give examples of heat transfer and local weather differences in Connecticut.</p>	<p>Weather and Water Investigation 9, Part 2 and 3 FOSSWeb, “Climate Factors”, “Climate Regions” Extending the Experience, “Use the Weather Satellite Data” (GOES 8),</p>	<p>Pages 303-314</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>Weather and Water Investigation 8, Parts 2 and 3 Science Resources, <i>“Laura’s Big Day”</i></p>	<p>Pages 265-275 Pages 57-62</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>Weather and Water Investigation 3, Parts 2 and 3 Science Resources, <i>"Where the Wild Wind Blows"</i> Investigation 4, Part 1 FOSSWeb, <i>"Convection"</i> <i>"Climatic Factors: Local Winds"</i></p> <p>Water Planet Science Resources, <i>"Uneven Heating"</i> <i>"Wind"</i></p> <p>Solar Energy Science Stories, <i>"The Sun, The Ocean, and the Weather"</i></p>	<p>Pages 97-110</p> <p>Pages 53-55 Pages 121-130</p> <p>Pages 42-45 Pages 46-51</p> <p>Pages 22-25</p>
<p>10. Design a weather forecast based on collected weather data.</p>	<p>Weather and Water Investigation 1, Parts 1 and 2 Video, <i>"Wonders of Weather"</i> Science Resources, <i>"Weather Tools"</i> Lab Notebook, <i>"Class Weather Chart"</i></p> <p>Water Planet Investigation 4, Part 3</p> <p>Solar Energy Science Stories, <i>"Predicting the Weather"</i></p>	<p>Pages 43-53</p> <p>Page 5</p> <p>LN Page #1</p> <p>Pages 204-216</p> <p>Pages 26-38</p>

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

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
<p>1. Discuss and chart the reasons why water is essential for life.</p> <p>2. Observe, analyze and record the unique physical and chemical properties of water.</p> <p>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.</p> <p>4. Investigate and explain in</p>	<p>Diversity of Life Investigation 1, Parts 1 and 2</p> <p>Chemical Interactions Investigation 4 Kinetic Energy, Part 2 Investigation 7 Phase Change Investigation 8 Solutions</p> <p>Weather and Water Science Resources, <i>'Earth : The Water Planet '</i></p>	<p>Pages 43-63</p> <p>Pages 130-138 Pages 189-234 Pages 248-268</p> <p>Pages 45-47</p>

<p>writing how substances, both harmful and beneficial, dissolve in and are carried by surface and ground water.</p> <p>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.</p> <p>6. Research and evaluate in writing the effects of common point and nonpoint water pollutants in Connecticut.</p> <p>7. Compare and contrast the general structures, processes and limitations of a septic system to a secondary wastewater treatment plant.</p> <p>8. Debate the effectiveness of a law designed to protect water resources.</p>	<p>Environments Science Stories, ‘<i>Water Pollution : The Lake Erie Story</i>’ ‘<i>Sources of Water Pollution</i>’</p> <p>Landforms This FOSS module for grade six engages students in the investigation of variables that influence erosion and deposition of earth materials and the creation of landforms. Students assemble models of mountains and create topographic maps. These concepts provide the foundation for extension to all landforms and water sources specific to Connecticut.</p>	<p>Page 36 Page 37</p>
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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:	FOSS Investigations	Page(s)
1. Conduct simple experiments that show and explain how forces work to change the motion of an object.	*Levers and Pulleys Investigation 1, Part 1 Investigation 2, Parts 1 and 3 Investigation 3, Parts 1-2 Science Stories, “ <i>Simple Machines</i> ” Force and Motion Investigation 6, Parts 1-2	Pages 8-17 Pages 8-13, pages 20-24 Pages 8-20 Pages 1-4 Pages 218-235
2. Calculate work done on an object as force or distance varies.	*Levers and Pulleys Investigation 1, Parts 2-3 Investigation 3, Part 1 Math Extension: <i>Problem of the Week</i> Investigation 4, Parts 1-2	Pages 19-28 Pages 8-14 TG Pages 26-27, SS #30 Pages 8-20
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	*Levers and Pulleys Investigation 1, Part 2 Investigation 2, Parts 1-3 Investigation 3, Part 2 Investigation 4, Parts 1-2 Science Stories: “Class 1 Levers” “The Wheel and Axle” “Class 2 Levers” “Class 3 Levers” “The Inclined Plane” “Pulleys” “The Wedge” “The Work of Pulleys” “The Screw”	Pages 18-23, Response Sheet #5 Pages 8-25, SS#12,#16,#17 Response Sheet # 19 & #20 Pages 16-20 Pages 8-20, Response Sheet #24 Pages 5-6 Pages 7-9 Pages 10-11 Pages 12-13 Pages 14-15 Pages 16-18 Pages 21-22 Pages 23-25 Pages 26-27
4. Determine ways to modify a simple machine (inclined plane, pulley and lever) to improve its mechanical advantage.	*Levers and Pulleys Investigation 1, Parts 2-3 Investigation 2, Part 1 Science Extension, “ <i>Build a Compound Lever</i> ” Investigation 3, Parts 1-2 Science Extension, “ <i>A Pulley Learning Station</i> ” Investigation 4, Part 3 Science Extensions: “ <i>Set Up Complex Systems</i> ”	Pages 18-23 Pages 8-13 Page 28 Pages 8-20 Page 28 Pages 21-25 Page 27

<p>5. Defend the statement, “Work output of a machine is always less than work input because of energy lost due to friction.”</p>	<p>Force and Motion Investigation 6, Parts 2-4 FOSSWeb, “<i>Multimedia Force Bench</i>”</p>	<p>Pages 229-245</p>
<p>6. Design and create a working compound machine from several simple machines.</p>	<p>*Levers and Pulleys Investigation 4, Part 3 FOSSWeb Activity, “Build a Rube Goldberg Machine” Science Extensions: “<i>Set Up Complex Systems</i>”</p>	<p>Pages 24-25 TG Website Pages 4-5 Page 27</p>
<p>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.</p>	<p>Force and Motion Investigation 1 Part 3 Investigation 8, Part 2 Science Resources: “<i>Faster and Faster</i>”</p>	<p>Pages 89-99 Pages 294-301 Pages 32-35</p>
<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>Covered in FOSS Matter and Energy, Investigation 1 For Grade 3/4 Science Stories: “<i>Energy Conversions</i>” and “<i>Energy on the Move</i>”</p>	<p>Pages 50-84</p>
<p>9. Trace energy conversions that occur in the human body once food enters and explain the conversions in writing.</p>	<p>Populations and Ecosystems Investigation 5, Parts 1 and 2</p>	<p>Pages 142-156</p>
<p>10. Calculate potential and kinetic energy and relate those quantities to total energy in a system.</p>	<p>Force and Motion Investigation 2, Part 3 Investigation 8, Part 2</p>	<p>Pages 89-99 Pages 294-301</p>
	<p>*Levers and Pulleys is a FOSS Unit for Grades 5-6 and has one class set (class of 32 of materials and books</p>	

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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
1. Compare and contrast single-celled organisms with	Diversity of Life Investigation 4, Parts 1 and 2	

<p>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 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</p>	<p>Science Resources: FOSSWeb & CD Lab: <i>“Cells and the Ribbon of Life”</i></p> <p>Diversity of Life Investigation 4, Parts 1 and 2 Science Resources: <i>“Cells: The Basic Unit of Life”</i> FOSSWeb & CD Lab: <i>“Cells and the Ribbon of Life”</i></p> <p>Diversity of Life Investigation 4, Parts 1 and 2 Science Resources: <i>“Cells: The Basic Unit of Life”</i> FOSSWeb & CD Lab: <i>“Cells and the Ribbon of Life”</i></p> <p>Covered in the FOSS Module Human Body for grades 3-4.</p> <p>Covered in the FOSS Module Human Body for grades 3-4.</p> <p>Covered in the FOSS Module Human Body for grades 3-4.</p> <p>Diversity of Life FOSSWeb & CD Lab: <i>“Cells and the Ribbon of Life” – “Circulatory and Respiratory Systems (mammal)”</i></p> <p>Diversity of Life FOSSWeb & CD Lab: <i>“Cells and the Ribbon of Life” – “Circulatory and Respiratory Systems (mammal)”</i></p> <p>*Food and Nutrition Science Stories, <i>“Blood: The Fluid that Connects”</i></p> <p>Diversity of Life FOSSWeb & CD Lab: <i>“Cells and the Ribbon of Life” – “Mammalian Digestive/Hepatic</i></p>	<p>Pages 133-141</p> <p>SS Pages 28-29</p> <p>Pages 133-141</p> <p>Pages 27-30 SS Pages 28-29</p> <p>Pages 133-141</p> <p>Pages 27-30 SS Pages 28-29</p>
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physical breakdown of food (mouth, esophagus, stomach, small intestine, large intestine and rectum).	<p><i>System</i></p> <p>*Food and Nutrition Science Stories; <i>"The Digestive System"</i></p> <p>*Food and Nutrition is a FOSS Unit for Grades 5-6 and has one class set (class of 32 of materials and books)</p>	<p>Pages 44-50</p> <p>pp. 6-9</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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
1. Illustrate and describe in writing the composition of the three major layers of the Earth's interior.	<p>Earth History Investigation 8, Parts 1 Science Resources: <i>"Destroying and Reconstructing Earth"</i></p>	<p>Pages 254-258</p> <p>Pages 100-105</p>
2. Explain how Earth's internal energy is transferred to move tectonic plates.	<p>Earth History Investigation 8, Parts 2 and 3 Science Resources: <i>"Destroying and Reconstructing Earth"</i> FOSSWeb, Time Room, <i>"Time Machine"</i> FOSSWeb, Geology Lab/Earth Processes, <i>"Volcanos"</i></p>	<p>Pages 259-269</p> <p>Pages 100-105</p>
3. Demonstrate the processes of folding and faulting of the Earth's crust.	<p>Earth History Science Resources: <i>"Destroying and Reconstructing Earth"</i> FOSSWeb, Geology Lab/Earth Processes, <i>"Faulting and Folding"</i></p>	<p>Pages 100-105</p>
4. Correlate common geological features/events (deep sea trenches, mountains, earthquakes, volcanoes) with the location of plate boundaries.	<p>Earth History Science Resources: <i>"Destroying and Reconstructing Earth"</i> FOSSWeb, Geology Lab/Earth Processes, <i>"Volcanoes"</i></p>	<p>Pages 100-105</p>
5. Compare geological features that result from constructive forces (e.g., mountains and ridges) with geological features that result from destructive	<p>Earth History Science Resources: <i>"Destroying and Reconstructing Earth"</i> Weather and Water FOSSWeb; <i>Climate Factors,</i></p>	<p>Pages 100-105</p>

<p>forces (e.g., canyons and flood plains).</p> <p>6. Analyze and interpret data about the location, frequency and intensity of earthquakes.</p> <p>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.</p> <p>8. Investigate and determine how glaciers form and affect the Earth's surface as they change over time.</p> <p>9. Distinguish between weathering and erosion.</p> <p>10. Observe and report on the geological events that are responsible for having shaped Connecticut's landscape.</p>	<p><i>Weather and Landforms</i></p> <p>Earth History Investigation 4, Parts 3 and 4 FOSSWeb, <i>Earth Processes: Stream Tables</i></p> <p>Earth History Investigation 4, Parts 3 -6 Video, "<i>Weathering and Erosion</i>" Science Resources; "<i>Grand Canyon Flood</i>" FOSSWeb; Geology Lab, Earth Processes</p> <p>Earth History Investigation 8, Parts 3 and 4 Local –Geology: Project Ideas, Project Design and Presentation Guidelines.</p>	<p>Pages 138-149</p> <p>Pages 138-162 SS, Pages 31-32</p> <p>Pages 64-67</p> <p>Pages 266-274</p> <p>Pages 344-346</p>
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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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
<p>1. Investigate and describe in writing different types of microbes and the environmental conditions necessary for their survival.</p>	<p>Diversity of Life Investigation 1 Parts 1-2 Investigation 3, Parts 1-3 Investigation 10, Parts 1-3</p>	<p>Pages 43-64 Pages 102-122 Pages 302-321</p>
<p>2. Describe the optimum conditions for rapid bacterial growth.</p>	<p>Diversity of Life Investigation 10, Parts 1-3 Video: "<i>The Unknown World</i>" FOSSWeb: "<i>Explore the House (IBTL)</i>"</p>	<p>Pages 302-321</p>
<p>3. Illustrate and describe the structural differences between bacterial and animal cells.</p>	<p>Diversity of Life Investigation 4, Parts 1-2 Science Resources: "<i>Cell: The Basic Unit of Life</i>" FossWeb: "<i>Cells and the Ribbon of Life</i>"</p>	<p>Pages 133-142</p> <p>Pages 27-30</p>

<p>4. Discover and discuss how humans use bacteria to produce food and identify examples.</p>	<p>Diversity of Life Investigation 10, Part 3 Lab Notebook, "<i>Microbes We Eat</i>"</p>	<p>Pages 317-321 Pages 74-78</p>
<p>5. Compare and contrast the role of bacteria in food production and food spoilage.</p>	<p>Diversity of Life Investigation 10, Part 3 Lab Notebook, "<i>Microbes We Eat</i>"</p>	<p>Pages 317-321 Pages 74-78</p>
<p>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.</p>		

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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
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.	Force and Motion Investigation 1, Parts 1-3 FOSSWeb, “ <i>Moving Along</i> ” Investigation 6, Parts 1-2	Pages 47-66 Pages 218-236
2. Calculate the average speed of a moving object, and distinguish between instantaneous speed and average speed of an object.	Force and Motion Investigation 2, Parts 1-3 Science Resources, “ <i>Time: the Infinite Line</i> ”, “ <i>First in Flight</i> ”, “ <i>How Fast Do Things Go?</i> ” Investigation 3, Parts 1-3 FOSSWeb, “ <i>Photo Finish</i> ” and “ <i>Graphing</i> ” Science Resources, “ <i>Iditarod: The Last Great Race on Earth</i> ” Video, “ <i>Sled Dogs: An Alaskan Epic</i> ”	Pages 78-99 Pages 1-2 Pages 3-6 Pages 7-10 Pages 111-127 Pages 11-16
3. Create and interpret distance-time graphs for objects moving at constant and nonconstant speeds.	Force and Motion Investigation 4, Parts 1-3 Science Resources, “ <i>Boston Treasure Hunt</i> ” and “ <i>Riding on Springer Hill</i> ” FOSSWeb, “ <i>Motion Stories</i> ”	Pages 138-155 Pages 20-26 Pages 27-31
4. Predict the motion of an object given the magnitude and direction of forces acting on it (net force).	Force and Motion Investigation 6, Parts 3-4 FOSSWeb, “ <i>Force Bench</i> ” Science Resources, “ <i>Aristotle, Galileo & Newton</i> ”	Pages 218-245 Pages 50-52
5. Investigate and demonstrate how unbalanced forces cause acceleration (change in speed and/or direction of an object’s motion).	Force and Motion Investigation 5, Parts 1-4 Science Resources, “ <i>Faster and Faster</i> ”, “ <i>The Other Great Race: Armadillo and Hare,</i> ”	Pages 169-201 Pages 32-35 Pages 36-40

<p>6. Assess in writing the relationship between an object's mass and its inertia when at rest and in motion.</p>	<p><i>"The Making of a Dotcar"</i> FOSSWeb, <i>"Dotmaker"</i> and <i>"Dotcar software"</i></p> <p>Force and Motion Investigation 6, Part 1 Investigation 8, Part 1 Science Resources, <i>"How Much Oomph?"</i> Video, <i>"Understanding Car Crashes"</i></p>	<p>Pages 41-49</p> <p>Pages 218-228 Pages 284-293</p> <p>Pages 70-74</p>
<p>7. Express mathematically how the mass of an object and the force acting on it affect its acceleration.</p>	<p>Force and Motion Investigation 5, Parts 1-4 Science Resources, <i>"Faster and Faster"</i>, <i>"The Other Great Race: Armadillo and Hare,"</i> FOSSWeb, <i>"Dotmaker"</i> and <i>"Dotcar software"</i></p>	<p>Pages 169-201</p> <p>Pages 32-35</p> <p>Pages 36-40</p>
<p>8. Design and conduct an experiment to determine how gravity and friction (air resistance) affect a falling object.</p>	<p>Force and Motion Investigation 7, Parts 1-3 Science Resources, <i>"Gravity: It's the Law"</i> <i>"How to Get and Hold on to a Moon"</i> Video, <i>"Galileo: On the Shoulders of Giants"</i></p>	<p>Pages 256-272</p> <p>Pages 62-66</p> <p>Pages 67- 69</p>
<p>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.</p>		

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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
<p>1. Relate the continued existence of any species to its successful reproduction and explain in writing the factors that contribute to successful reproduction.</p>	<p>Populations and Ecosystems Investigation 1, Parts 1-3 Science Resources, <i>"Milkweed Bugs"</i> Investigation 6, Parts 1-3 Science Resources, <i>"Limiting Factors"</i> FOSSWeb, <i>"Milkweed Bugs Unlimited"</i></p>	<p>Pages 41-59</p> <p>Pages 3-5 Pages 179-198</p> <p>Pages 22-24</p>

<p>2. Describe the structure, location and function of chromosomes, genes and DNA and how they relate to each other in the living cell.</p> <p>3. Illustrate and chart the purpose, cell type (somatic and germ) and resulting chromosome count during cell division in mitosis and meiosis.</p> <p>4. Identify the major structures in human male and female reproductive systems and explain where meiosis and gamete formation take place.</p> <p>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.</p> <p>6. Compare and contrast the events and processes that occur when a human egg is fertilized or not fertilized.</p> <p>7. Demonstrate the relationship of corresponding genes on pairs of chromosomes to traits inherited by offspring.</p> <p>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.</p>	<p><i>"Milkweed Bugs Limited"</i></p> <p>Populations and Ecosystems Investigation 9, Parts 1-2 Science Resources, <i>"From Mendel to Human Genome: Solving the Heredity Puzzle"</i></p> <p>Populations and Ecosystems Investigation 9, Parts 1-2 Science Resources, <i>"From Mendel to Human Genome: Solving the Heredity Puzzle"</i></p> <p>Diversity of Life Investigation 4, Parts 1-2 Science Resources, <i>"Cell: The Basic Unit of Life"</i> FOSSWeb, <i>"Cells and the Ribbon of Life"</i></p> <p>Populations and Ecosystems Science Resources, <i>"From Mendel to Human Genome: Solving the Heredity Puzzle"</i></p> <p>Populations and Ecosystems Investigation 9, Parts 1-2 Science Resources, <i>"From Mendel to Human Genome: Solving the Heredity Puzzle"</i></p> <p>Populations and Ecosystems Investigation 9, Parts 1-4 Science Resources, <i>"From Mendel to Human Genome: Solving the Heredity Puzzle"</i> FOSSWeb, <i>"Larkeys, Offspring Genotype and Phenotype"</i> <i>"Larkeys, "Impossible Traits"</i></p>	<p>Pages 267-273</p> <p>Pages 46-55</p> <p>Pages 267-273</p> <p>Pages 46-55</p> <p>Pages 133-141</p> <p>Pages 27-30</p> <p>Pages 46-55</p> <p>Pages 267-273</p> <p>Pages 46-55</p> <p>Pages 267-291</p> <p>Pages 46-55</p>
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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

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
<p>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.</p> <p>2. Describe in writing how gravitational attraction and the inertia of objects in the solar system keep them on a predictable elliptical pathway.</p> <p>3. Distinguish between rotation of Earth on its axis and its elliptical revolution around the sun.</p> <p>4. Investigate and report in writing how the Earth's revolution around the sun affects changes in daylight and seasons.</p> <p>5. Compare the revolution times of all the planets and relate it to their distance from the sun.</p> <p>6. Conduct and report on an investigation that shows how</p>	<p>Force and Motion Investigation 7, Part 1 Science Resources, "Gravity: It's the Law" "How to Get and Hold on to a Moon"</p>	<p>Pages 256-262</p> <p>Pages 62-66</p> <p>Pages 67-69</p>
	<p>Force and Motion Science Resources, "Gravity: It's the Law" "How to Get and Hold on to a Moon"</p>	<p>Pages 62-66</p> <p>Pages 67-69</p>
	<p>Planetary Science Science Resources, "The Solar System in a Nutshell" FOSSWeb, Solar System Planet Locator</p>	<p>Pages 84-89</p>
	<p>Planetary Science Investigation 3, Parts 1-2 FOSSWeb, Day/Night Simulation</p>	<p>Pages 89-98</p>
	<p>Weather and Water Investigation 3, Parts 1-2 Science Resources "Seasons" FOSSWeb, "Cycles:Seasons"</p>	<p>Pages 93-102</p> <p>Pages 17-19</p>
	<p>Weather and Water Investigation 3, Parts 1-3 Science Resources "Wendy and Her Worldwide Weather Watchers" "Seasons" FOSSWeb, "Cycles:Seasons" Response Sheet "Seasons & Sun" Quick Write, "What Causes the Seasons"</p>	<p>Pages 93-110</p> <p>Pages 12-16</p> <p>Pages 17-19</p> <p>Science Notebook Page 11</p> <p>TG Page 95</p>
<p>Planetary Science Investigation 10, Parts 2-3 Science Resources, "The Solar System in a Nutshell"</p>	<p>Pages 318-324</p> <p>Pages 84-89</p>	
<p>Weather and Water Investigation 3, Part 3</p>	<p>Pages 103-110</p>	

<p>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>7. Use a model to demonstrate the phases of the moon relative to the position of the sun, Earth and moon.</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>Science Notebook, "<i>Beam Spreading</i>"</p> <p>Planetary Science Investigation 4, Part 1 Investigation 9, Parts 1-4 Science Resources, "<i>Moonrise/Sunrise Data</i>" "<i>The Search for New Moons</i>" FOSSWeb, "<i>Lunar Calendar</i>" and "<i>Phases of the Moon</i>"</p> <p>Planetary Science FOSSWeb, <i>Day/Night Simulation with Earth, Moon and Sun</i></p>	<p>Science Notebook Page 13</p> <p>Pages 120-125 Pages 283-301</p> <p>Page 38 Pages 80-83</p>
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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.

Grade-Level Expectations Students should be able to:	FOSS Investigations	Page(s)
<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>		