

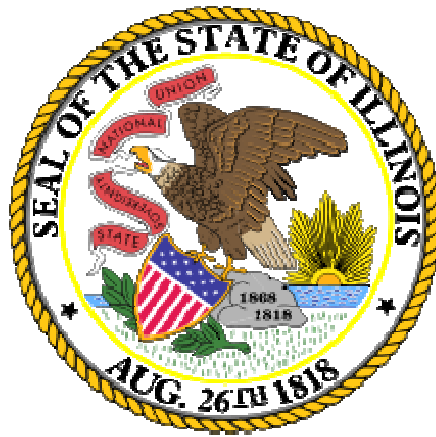


Full Option Science System
(FOSS™)
Grades K-8

Correlation to

Illinois
Science Assessment Framework

Enhanced Assessment
for Grades 4 and 7



**Illinois Science Assessment Framework
Illinois Enhanced Assessment for Grades 4 and 7
Correlated to FOSS (Full Option Science System)**

Grade 4

Science - Goal 11

Understand the processes of scientific inquiry and technological design to investigation questions, conduct experiments, and solve problems.

<i>SCIENTIFIC INQUIRY</i> <i>(Standard A)</i>	<i>FOSS Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
11.4.01 Design and perform simple experiments.	This standard is addressed in ALL FOSS modules. See for example: Animals Two by Two Investigation 2, Part 2 Balance and Motion, Investigation 2, Parts 1-3 Plants and Animals Investigation 1, Sci. Ext. 2, 3 Human Body, Investigation 4, Parts 1-3 Matter and Energy Investigation 2, Part 1	Pages 14-17 snail races Pages 8-25 spinners Pages 76-77 Pgs 8-24 stimulus/response Pages 93-102
11.4.02 Distinguish among – and perform – the following things: observation, drawing a conclusion based on an observation, forming a hypothesis, conducting an experiment, organizing data, constructing and reading charts and graphs, and comparing data.	This standard is addressed in ALL FOSS modules at a developmentally appropriate level. See for example: Wood and Paper Investigation 1, Parts 4-5 Insects and Plants Investigation 3, Parts 1-3 Pebbles, Sand and Silt, Investigation 2, Parts 1-4 Plants and Animals Investigation 1, Parts 1-3 Matter and Energy Investigation 3, Part 2 Physics of Sound, Investigation 3, Parts 1-2 Sun, Moon, and Stars Investigation 1, Part 1	Pages 24-32 sinking wood Pages 129-152 Pages 8-29 rock sizes Pages 47-72 Pages 139-150 Pages 8-19 sound travel Pages 42-55
11.4.03 Compare observations of individual and group results.	This standard is addressed in discussions in ALL FOSS investigations. See for example: Fabric, Investigation 2, Part 4 New Plants, Investigation 1, Parts 1-3 Insects and Plants	Pages 22-25 fabric uses Pages 8-30 fast plants

	Investigation 2, Part 3 Plants and Animals Investigation 1, Part 3 Matter and Energy Investigation 4, Part 3 Sun, Moon, and Stars Investigation 1, Part 1 Structures of Life, Investigation 1, Parts 1-3	Pages 105-115 Pages 63-72 Pages 193-204 Pages 42-55 Pages 8-33 seed studies
11.4.04 Distinguish among the following: recording the data from an experiment, organizing data into a more useful form, analyzing it to identify relevant patterns, and reporting and displaying results.	This standard is addressed throughout FOSS modules as students record data on lab sheets or lab notebooks and report results and conclusions, using tables and graphs where appropriate. See for example: New Plants, Investigation 1, Part 3 Solids and Liquids, Investigation 4, Parts 1-3 Insects and Plants Investigation 2, Part 3 Plants and Animals Investigation 1, Part 3 Human Body, Investigation 4, Parts 1-3 Matter and Energy Investigation 4, Part 3 Measurement, Investigation 4, Parts 1-2 Structures of Life, Investigation 2, Parts 1-3	Pages 23-30 Brassica life cycle Pages 7-27 solids and liquids in water Pages 105-115 Pages 63-74 Pages 8-24, stimulus/response Pages 193-204 Pages 8-17 temperature Pages 8-22 bean life cycle
TECHNOLOGICAL DESIGN (Standard B)	<i>FOSS Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
11.4.05 Identify a design problem and identify possible solutions. Assess designs or plans to build a prototype.	Wood and Paper, Investigation 5, Parts 2-3 Solids and Liquids, Investigation 1, Part 3 Balance and Motion, Investigation 3, Parts 1-3 Physics of Sound, Investigation 4, Parts 1-2 Magnetism and Electricity, Investigation 4, Parts 1-3 Investigation 5, Parts 1-2 Human Body, Investigation 3, Parts 1-3 Water, Investigation 4, Part 2	Pages 18-21 Pages 21-24 Pages 6-25 Pages 6-20 Pages 8-22 electromagnets Pages 8-20 telegraph Pages 8-21 models Pages 14-18 waterwheels
11.4.06 Assess given test results on a prototype (i.e.	Magnetism and Electricity, Investigation 5, Parts 1-2	Pages 8-20

draw conclusions about the effectiveness of the design using given criteria).	Physics of Sound Investigation 4, Parts 1-2	Pages 6-20
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Science - Goal 12

Understand the fundamental concepts, principles, and interconnections of life, physical and earth/space sciences.

<i>LIVING THINGS</i> <i>(Standard A)</i>	<i>FOSS Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
Classification 12.4.01 Distinguish between living and nonliving things.	ALL FOSS modules in Life Science strand, such as Trees Investigation 1, Parts 1-8 Animals Two by Two, Investigation 3, Parts 1-3 Insects and Plants Investigation 2, Part 1 New Plants Investigation 4, Parts 1-2 Insects Investigation 1, Part 3 Plants and Animals Investigation 3, Parts 1-3 Structures of Life Investigation 1, Parts 1-3	Pages 7-37 living trees, tree parts, and images of trees Pages 8-20 worms in soil Pages 91-94 Pages 7-19 bulbs and roots Pages 8-25 Pages 120-140 Pages 8-33
12.4.02 Understand the concept of a food chain and the related classifications of plants or animals (e.g. producers, decomposers, consumers, herbivores, and carnivores).	<u>Structures of Life FOSS Science Stories</u> <u>Water FOSS Science Stories</u> Human Body Investigation 1, Part 3	Page 28 “The Food Web” Pages 5-7 The Pond Pages 21-25 owl pellets
12.4.03 Identify the basic divisions of animals and their common characteristics (e.g. define mammal, fish, bird, reptile, amphibian, insect, and arachnid; give examples of each).	Insects, ALL, such as Investigation 1, Parts 1-3 <u>Insects FOSS Science Stories</u> Insects and Plants Investigation 3, Part 3 <u>Insects and Plants FOSS Science Resources</u> Plants and Animals Investigation 3, Part 3 Structures of Life, Investigation 3, Parts 1-4 <u>Structures of Life FOSS Science Stories</u>	Pages 8-25 insects Pages 12-17 Pages 145-155 Pages 30-34 Pages 135-142 Pages 8-30 crayfish Pages 17-19, 24-27

<p>Reproduction 12.4.04 Identify the life cycle of familiar animals and compare their various stages: birth, growth and development, reproduction, and death. Understand that metamorphosis occurs in some animals (e.g. in butterflies and frogs).</p>	<p>New Plants, Investigation 1, Parts 1-3 <u>New Plants FOSS Science Stories</u> Insects, ALL, such as Investigation 2, Parts 1-3 Investigation 5, Parts 1-3 <u>Insects FOSS Science Stories</u> Insects and Plants Investigation 3, Part 3 <u>Insects and Plants FOSS Science Resources</u> Structures of Life ALL, such as Investigation 3, Parts 1-4 Investigation 4, Parts 1-3 <u>Structures of Life FOSS Science Stories</u></p>	<p>Pages 8-30 Brassica Pages 12-17 Pages 8-24 Waxworms Pages 10-24 Painted lady Pages 16-21 Pages 145-155 Pages 37-43, 44-56 Pages 8-30 Pages 8-24 Pages 1-3, 20-21, 25</p>
<p>12.4.05 Understand that some characteristics of living things are inherited from parents, such as the color of a flower in a plant, or the number of limbs on an animal. Understand that other features, however, are acquired by an organism through interactions with its environment, and cannot be passed down to the next generation merely through reproduction.</p>	<p>Animals Two by Two, Investigation 5, Parts 1-4 New Plants, Investigation 1, Parts 1-3 <u>New Plants FOSS Science Stories</u> Insects, ALL, such as Investigation 3, Parts 1-3 Insects and Plants Investigation 1, Part 3 <u>Insects and Plants FOSS Science Resources</u> Structures of Life ALL, such as Investigation 2, Parts 1-3 Investigation 3, Parts 1-4 <u>Structures of Life FOSS Science Stories</u></p>	<p>Pages 10-27 Pages 8-30 Brassica Pages 3-12 Pages 8-26 Pages 71-80 Pages 8-14 Pages 8-22 Hydroponic beans Pages 8-30 Pages 6-16</p>
<p>ENVIRONMENT AND INTERACTION OF LIVING THINGS (Standard B)</p>	<p><i>FOSS Investigations that prepare students for this assessment</i></p>	<p><i>Page Numbers</i></p>
<p>12.4.06 Identify the basic needs of living things: animals need air, water, food and shelter; plants need air, water, nutrients, and light.</p>	<p>Trees, Investigation 1, Parts 1, 2, 8 <u>Trees FOSS Science Stories</u> Animals Two by Two Investigation 1, Parts 2-4 Insects, ALL, such as Investigation 3, Parts 1-3 Insects and Plants Investigation 2, Part 2 New Plants, Investigation 1, Parts 1-3 <u>New Plants FOSS Science Stories</u> Plants and Animals Investigation 3, Part 1</p>	<p>Pages 7-19, 35-37 Pages 3-15 Pages 17-29 Pages 8-26 insect habitats Pages 95-104 Pages 8-30 Brassica Pages 3-12 “What Do Plants Need?” Pages 120-127</p>

	<u>Plants and Animals FOSS Science Resources</u> Structures of Life ALL , such as Investigation 2, Parts 1-3 <u>Structures of Life FOSS Science Stories</u>	Pages 3-8, 21-27 Pages 8-22 Hydroponic beans Pages 6-16
12.4.07 Know that the world contains many kinds of environments, and that different animals and plants are suited to live in different environments.	Trees FOSS Science Stories Animals Two by Two, ALL , such as Investigation 3, Parts 1-3 New Plants FOSS Science Stories Insects, ALL, such as Investigation 1, Parts 1-3 Insects FOSS Science Stories Insects and Plants Investigation 1, Parts 2-3 <u>Insects and Plants FOSS Science Resources</u> Plants and Animals Investigation 3, Part 3 <u>Plants and Animals FOSS Science Resources</u> Structures of Life FOSS Science Stories Water FOSS Science Stories	Pages 3-13 Pages 8-20 Pages 18-23 “Plants around the World” Pages 8-25 Pages 3-11 Pages 62-80 Pages 8-14, 26-29 Pages 135-143 Pages 28-46 Pages 17-19,22-25 Pages 5-7
12.4.08 Understand that each plant or animal has different structures that serve different functions in its growth, survival, and reproduction.	Trees, ALL , such as Investigation 1, Parts 1-3 Animals Two by Two ALL , such as Investigation 1, Parts 1-4 New Plants , Investigation 1, Parts 1-3 <u>New Plants FOSS Science Stories</u> Insects, ALL , such as Investigation 1, Parts 1-3 Insects and Plants Investigation 4, Part 4 Plants and Animals Investigation 1, Parts 1-3 <u>Plants and Animals FOSS Science Resources</u> Structures of Life ALL , such as Investigation 1, Parts 1-3 Investigation 3, Parts 1-4 <u>Structures of Life FOSS Science Stories</u> Human Body , Investigation 1, Parts 1-3 Investigation 3, Parts 1-3 Human Body FOSS Science	Pages 7-22 tree structures Pages 10-29 fish structures Pages 8-30 Pages 3-11 Pages 8-25 Pages 179-186 Pages 41-74 Pages 28-46, 47-51 Pages 8-22 plant structures Pages 8-30 animal structures Pages 1-3,6-9,12-16,17-25,26-27 Pages 8-20 bones Pages 8-21 muscles Pages 1-16, 28-29

	<u>Stories</u>	
12.4.09 Identify the basic classifications of animals based on how they interact with their environment [e.g., (a) Some animals are active in the daytime (diurnal), others in the nighttime (nocturnal). (b) Some animals have a body temperature that stays the same regardless of significant temperature changes in their immediate environment (warm blooded), others have a body temperature that rises and falls with the temperature changes of their environment (cold blooded). (c) Some animals eat only plants (herbivores), others eat animals (carnivores).].	<u>Plants and Animals FOSS Science Resources</u> <u>Structures of Life FOSS Science Stories</u>	Page 22 Page 28
12.4.10 Understand that an ecosystem is made of living and nonliving things. Be familiar with the concepts of a food web and a food chain.	Plants and Animals Investigation 3, Parts 1-3 <u>Structures of Life FOSS Science Stories</u> <u>Water FOSS Science Stories</u>	Pages 120-143 Page 28 The Food Web Pages 5-7 The Pond
12.4.11 Understand that some animals survive winter by being fitted for an active life during winter (e.g. penguins), others by hibernation (e.g., certain bears), and others by migration (e.g. monarch butterflies).	Insects Investigation 5, Parts 1-3 <u>Structures of Life FOSS Science Stories</u>	Pages 10-24 Pages 19, 22-25
12.4.12 Understand that human activities can change the number of species in an area, whether by increasing it or decreasing it.		

MATTER AND ENERGY (Standard C)	<i>FOSS Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
<p>Properties of Matter 12.4.13 Understand that an increase in temperature generally causes things to expand, and that a decrease in temperature generally causes things to contract. Identify the major exception: ice contracts as it melts into water, and water expands as it freezes into ice.</p>	<p>Mater and Energy Investigation 4, Part 1 Water Investigation 2, Part 3 <u>Water FOSS Science Stories</u></p>	<p>Pages 174-180 Pages 19-24 Water as Ice Pages 8-11</p>
<p>12.4.14 Understand that when a material is dissolved in water, it is not really gone even if it can no longer be seen. Understand that many materials dissolve in water, but others do not. For example, salt and sugar dissolve in water, but oils do not.</p>	<p>Solids and Liquids Investigation 4, Part 1 Water Investigation 1, Part 2 Note: this is a major focus of Mixtures and Solutions, designed for Grades 5-6.</p>	<p>Pages 7-16 Pages 14-18</p>
<p>12.4.15 Understand that matter is usually found in 3 states: liquid, solid, and gas. Understand that water can be found in these forms, and is called water, ice, and water vapour, accordingly. Understand that heating causes a solid substance to melt into liquid form and a liquid substance to evaporate into gaseous form, and that cooling causes a gaseous substance to condense into a liquid form and a liquid substance to freeze into solid form. Understand that changes in state of matter do not produce new substances.</p>	<p>Solids and Liquids, Investigation 1, Parts 1-2 Investigation 2, Parts 1-2 <u>Solids and Liquids FOSS Science Stories</u> Air and Weather, Investigation 1, Parts 1-3 Investigation 2, Parts 3-4 Matter and Energy Investigation 4, Part 2 <u>Matter and Energy FOSS Science Resources</u> Water Investigation 3, Parts 1-4 <u>Water FOSS Science Stories</u></p>	<p>Pages 8-20 Pages 10-20 Pages 3-17 Pages 8-20 Pages 20-27 Pages 181-192 Pages 39-42, 49-50, 54-59 Pages 8-26 Pages 1-2,8-16</p>
<p>Energy/Electricity 12.4.16 Understand that a magnet attracts iron, but not plastic, paper, and other non-metals; nor does it attract all metals (since it does not attract copper or aluminum)</p>	<p>Magnetism and Electricity Investigation 1, Parts 1-4 <u>Magnetism and Electricity FOSS Science Stories</u></p>	<p>Pages 8-34 Pages 1-4</p>
<p>12.4.17 Understand that rubbing together certain objects produces a static electrical charge; in</p>	<p>Magnetism and Electricity <u>FOSS Science Stories</u></p>	<p>Pages 6-9</p>

particular, rubbing a balloon on someone's hair or walking in a dry room can build up a charge on the person walking (which is felt as a shock when that person touches someone else). Understand that objects can be positively charged, or negatively charged.		
12.4.18 Understand that objects of like charge repel each other, and that objects of opposite charge attract each other.	Magnetism and Electricity Investigation 1, Parts 1-4 <u>Magnetism and Electricity FOSS Science Stories</u>	Pages 8-34 Pages 5-6
12.4.19 Understand that electrical energy can be converted to heat, light, and motion.	Magnetism and Electricity Investigation 2, Parts 1-4 <u>Magnetism and Electricity FOSS Science Stories</u> Matter and Energy Investigation 1, Parts 1-2 <u>Matter and Energy FOSS Science Resources</u>	Pages 8-29 bulbs and motors Pages 10-16, 20-29 Pages 50-70 Pages 1-7, 8-14
12.4.20 Understand that besides static electricity, there is also such a thing as current electricity. (Students will learn about this by building simple series circuits and parallel circuits.) Given simple diagrams of electrical circuits, identify whether the circuit is the series type or parallel.	Magnetism and Electricity Investigation 3, Parts 1-3 <u>Magnetism and Electricity FOSS Science Stories</u> <u>Matter and Energy FOSS Science Resources</u>	Pages 10-26 series and parallel circuits Pages 17-19 Page 14
Light 12.4.21 Understand that lighter colors reflect more light, darker absorb more, and that the color one sees depends on what kind of light is reflected (rather than absorbed) by the object seen.	Ideas and Inventions FOSS <u>Science Stories</u> Matter and Energy Investigation 2, Parts 1-2 <u>Matter and Energy FOSS Science Resources</u>	Pages 23-27 reflection Pages 93-118 Pages 24-37
12.4.22 Understand that white light can be broken into all the colors of the rainbow by means of prisms.	<u>Matter and Energy FOSS Science Resources</u>	Page 33
12.4.23 Understand that light can be reflected, refracted, transmitted, and absorbed by matter.	Ideas and Inventions FOSS <u>Science Stories</u> Matter and Energy Investigation 2, Parts 1-2 <u>Matter and Energy FOSS Science Resources</u>	Pages 23-27 reflection and refraction Pages 93-118 Pages 23-36
12.4.24 Identify the colors		

associated with the acronym ROYGBIV.		
<i>FORCE AND MOTION</i> <i>(Standard D)</i>	<i>FOSS Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
12.4.25 Define a force as a push or a pull that tends to move an object. Understand that forces may be balanced or unbalanced. Know that when the forces applied to an object are balanced, the motion or rest of that object does not change.	Balance and Motion ALL, such as Investigation 2, Parts 1-3 <u>Balance and Motion FOSS Science Stories</u> Water , Investigation 4, Part 2	Pages 8-25 Pages 3-14 Pages 14-18 waterwheels
12.4.26 Identify the basic forces, such as friction, magnetism, and gravity. Identify which force is operative in a simple scenario.	Magnetism and Electricity , Investigation 1, Parts 2-4 <u>Magnetism and Electricity FOSS Science Stories</u>	Pages 18-34 (magnetism, gravity) Pages 5-6
12.4.27 Identify simple machines (lever, inclined plane, screw, and wheel and axle). Understand how they apply forces with advantage, and identify which machine is suited for accomplishing a given simple task.	This standard is addressed in Levers and Pulleys, designed for Grades 5-6.	
12.4.28 Identify equilibrium conditions (e.g. in a diagram of balanced weights on levers or pulleys).	Matter and Energy Investigation 3, Part 2 Measurement , Investigation 2, Parts 1-3 This standard is also addressed in Levers and Pulleys, designed for Grades 5-6.	Pages 139-150 Pages 8-21 (balances)
<i>EARTH SCIENCE</i> <i>(Standard E)</i>	<i>FOSS Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
Basic Earth Science 12.4.29 Identify which everyday materials decompose more slowly (e.g. plastics, glass and ceramics decompose slower than metals, wood or food substances). Understand the environmental ramifications of this (e.g. glass and plastic trash, if not recycled, will sit in landfills for hundreds of years).		
12.4.30 Understand that fossil fuels come from	<u>Matter and Energy FOSS Science Resources</u>	Page 9

animals and plants, and that oil and coal are examples of fossil fuels.		
<p>The Earth's Dynamic Processes</p> <p>12.4.31 Understand that the surface of the earth changes. Know that some changes are due to slow processes (e.g. erosion and weathering), whereas others are due to sudden events (e.g. landslides, volcanic eruptions, earthquakes, and asteroid impacts).</p>	<p><u>Pebbles, Sand and Silt</u> <u>FOSS Science Stories</u></p>	<p>Pages 8-13</p>
<p>12.4.32 Understand that the changes in the surface of the earth cause changes in the environments of living things, and that living things have the ability to adapt to changes in their environments by gradual changes in their structures and behaviors.</p>		
<p>12.4.33 Identify the three basic kinds of rocks: igneous, sedimentary, and metamorphic.</p>	<p><u>Earth Materials FOSS</u> <u>Science Stories</u></p>	<p>Pages 1-7 sedimentary</p>
<p>12.4.34 Understand that movement in parts of the earth's crust causes earthquakes.</p>		
<p>12.4.35 Understand that the main cause of erosion is moving water. Understand that when water erodes landmasses, it carries land away by rainfall and rivers and re-deposits it in the form of pebbles, sand, silt and mud. Understand that the delta of a river is formed by such deposits. Understand that deposition of new soil over a flood plain is what makes a river valley fertile. Identify other causes of erosion besides erosion by water (e.g. wind and chemical erosion).</p>	<p><u>Pebbles, Sand and Silt,</u> Investigation 2, Parts 3-4 <u>Pebbles, Sand and Silt FOSS</u> <u>Science Stories</u> <u>Earth Materials FOSS</u> <u>Science Stories</u></p> <p>Erosion is addressed with stream tables in Landforms, designed for Grades 5-6.</p>	<p>Pages 18-23 Sand, silt and clay in water</p> <p>Pages 8-13</p> <p>Pages 11-13</p>
<p>12.4.36 Understand that land formations (mountains, valleys, shorelines, and</p>	<p><u>Earth Materials FOSS</u> <u>Science Stories</u></p>	<p>Pages 5-7, 11-13, 16</p>

<p>caves) change slowly over time, and identify the major natural causes of such changes: (a) Slow causes: erosion, caused by wind, rain, glaciers, water freezing inside cracks of rocks (which expands and splits the rocks), the growth of tree roots; (b) sudden causes: rare catastrophes (e.g. earthquakes, volcanic activity, asteroid impacts, and floods).</p>	<p>This standard is also addressed with stream tables in Landforms, designed for Grades 5-6.</p>	
<p>The Atmosphere 12.4.37 Name and distinguish the different kinds of clouds based on their appearance and place in the atmosphere: cirrus, cumulus, and stratus.</p>	<p>Air and Weather Investigation 2, Part 3 <u>Air and Weather FOSS Science Stories</u></p>	<p>Pages 20-23 Pages 7-12</p>
<p>12.4.38 Identify the stages of the water cycle: evaporation, condensation, and precipitation.</p>	<p>Air and Weather Investigation 2, Part 3 <u>Air and Weather FOSS Science Stories</u> Water, Investigation 3, Parts 1-4 <u>Water FOSS Science Stories</u></p>	<p>Pages 20-33 Pages 7-12 Pages 8-26 Pages 13-16</p>
<p>12.4.39 Understand that weather changes from day to day and over the seasons. Identify the order of the seasons and the different characteristics of each season in terms of temperature and precipitation and the presence or absence of leaves on trees.</p>	<p>Trees, Investigation 3, Parts 1-9 <u>Trees FOSS Science Stories</u> Air and Weather, Investigation 4, Parts 1-3 <u>Air and Weather FOSS Science Stories</u></p>	<p>Pages 10-38 “Trees Through the Seasons” Pages 14-24 Pages 8-24 Pages 18-23</p>
<p>12.4.40 Understand that weather can be described by measurable quantities, such as temperature, wind direction and speed, and amount of precipitation.</p>	<p>Air and Weather, ALL, such as Investigation 2, Parts 1-4 Investigation 3, Parts 1-5 <u>Air and Weather FOSS Science Stories</u></p>	<p>Pages 8-27 Pages 8-33 Pages 14-15</p>
<p>12.4.41 Understand that weather systems can be tracked – and their motions roughly predicted – by satellites.</p>		

<p>Water 12.4.42 Understand that most of Earth’s surface is covered by water, and identify the major kinds of land and water formations: continent, mountain, valley, cave, ocean, lake, and river.</p>	<p><u>Water FOSS Science Stories</u> This standard is also addressed in detail in Landforms, designed for Grades 5-6.</p>	<p>Pages 1-2,4-9,12,14-16,22-23</p>
<p>ASTRONOMY <i>(Standard F)</i></p>	<p><i>FOSS Investigations that prepare students for this assessment</i></p>	<p><i>Page Numbers</i></p>
<p>12.4.43 Understand that moons and planets do not produce their own light – the light we see when we look at them is the sunlight which they reflect.</p>	<p><u>Ideas and Inventions FOSS Science Stories</u> <u>Sun, Moon, and Stars FOSS Science Resources</u></p>	<p>Page 23 Page 19</p>
<p>12.4.44 Identify the relative positions of the earth, moon, and sun during a solar eclipse, a lunar eclipse, a full moon, a half moon, and a new moon. Given the diagram of the earth, moon, and sun, identify which of these is depicted.</p>	<p><i>New national version of <u>Ideas and Inventions FOSS Science Stories</u> addresses this standard.</i> Sun, Moon, and Stars Investigation 2, Part 2 <u>Sun, Moon, and Stars FOSS Science Resources</u></p>	<p>Pages 89-102 Pages 19-33</p>
<p>12.4.45 Identify the order of the planets from the sun, and know that the further planets take longer to go around the sun. Understand that Neptune and Pluto occasionally switch order.</p>	<p><u>Sun, Moon, and Stars FOSS Science Resources</u></p>	<p>Pages 16-18</p>
<p>12.4.46 Know that astronauts have walked on the moon.</p>	<p>Sun, Moon, and Stars Investigation 2 Language Ext</p>	<p>Page 102</p>
<p>12.4.47 Define a constellation as a group of stars that form a pattern in the sky. Understand that constellations are useful in the study of space because they help create a map of the sky. Know that locations in the sky are often described using the names of constellations.</p>	<p><i>New national version of <u>Ideas and Inventions FOSS Science Stories</u> addresses this standard.</i> Sun, Moon, and Stars Investigation 3, Parts 1-2</p>	<p>Pages 114-135</p>
<p>12.4.48 Understand that the Milky Way is our galaxy, so-called because there appears to be a milky-white path or road in the sky.</p>	<p>Sun, Moon, and Stars Investigation 3, Part 2</p>	<p>Pages 126-135</p>
<p>12.4.49 Understand that the mass of a body stays the same on different planets, but the weight changes</p>		

depending on the mass of the planet.		
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Science - Goal 13

Understand the relationships among science, technology, and society.

<i>SAFETY and PRACTICES OF SCIENCE</i> <i>(Standard A)</i>	<i>FOSS Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
13.4.01 Identify the basic safety equipment used in science, (e.g. gloves, goggles, lab coats, and tongs).	All FOSS Modules emphasize safety. Investigations for K-4 modules are designed using materials that are not harmful to students so that special safety equipment can be used, but is not needed until higher grades. Earth Materials, Investigation 1, Part 2	Page 19 goggles
13.4.02 Identify the basic safety procedures (e.g., “Keep your clothes and hair away from open flames” and “Don’t taste materials without permission.” When conducting science activities.	Safety is of highest concern in FOSS Modules. All kits come with a safety poster. The teacher guide contains general safety guidelines with specifics and special cautions related to certain lessons, denoted with a “goggles” icon in “Getting Ready” and the lesson plan. See for example: Human Body, Overview Investigation 1, Part 3 Matter and Energy Investigation 1, Part 1	P. 17 “Safety in Classroom” Pages 22-23 Pages 50-62
13.4.03 Explain why similar results are expected when procedures are done the same way.	This standard is addressed throughout ALL FOSS investigations as classes discuss their results. See for example: Balance and Motion Investigation 1, Part 2 Structures of Life, Investigation 1, Parts 1-3 Magnetism and Electricity Investigation 1, Part 3 Matter and Energy Investigation 4, Parts 1-3 Measurement, ALL such as Investigation 2, Part 1	Pages 14-18 Pages 8-30 Pages 23-29 Pages 174-204 Pages 8-13 <i>(Concept is deliberately introduced with discrepant events.)</i>
13.4.04 Know what distinguishes science from mere guesswork is its	This standard is emphasized in ALL FOSS investigations. See for example:	

<p>reliance on and openness to challenge through experiments and careful observation. Know that scientific results must be reproducible. Know that different scientists study different subjects but work in similar ways.</p>	<p>Air and Weather Investigation 2, Parts 1-4 Pebbles, Sand and Silt Investigation 1, Parts 1-4 Plants and Animals Investigation 3, Parts 1-3 Earth Materials Investigation 1, Parts 1-3 Matter and Energy Investigation 3, Parts 1-2 <u>Matter and Energy FOSS Science Resources</u> Sun, Moon, and Stars Investigation 1, Parts 1-2 <u>Sun, Moon, and Stars FOSS Science Resources</u> <u>Water FOSS Science Stories</u> <u>Structures of Life FOSS Science Stories</u> FOSS Web site for ALL FOSS modules</p>	<p>Pages 8-27 and “Meteorologist Tool Kit” Pages 8-25 Pages 120-143 Pages 8-29 geologists Pages 129-150 Pages 43-46, 51 Pages 42-70 Pages 40-47 Pages 24-26 Pages 6-9 www.fossweb.com “Careers”</p>
<p>13.4.05 Know that scientists accept a theory that is supported by tests and experiments until it is disproved or improved upon.</p>	<p><u>Sun, Moon, and Stars FOSS Science Resources</u> <u>Matter and Energy FOSS Science Resources</u></p>	<p>Pages 40-47 Pages 43-46</p>
<p>13.4.06 Distinguish between the kinds of questions that can be investigated by the scientific method and those that cannot.</p>	<p>ALL FOSS Investigations begin with a question that can be investigated. See for example: Water Investigation 1, Part 2</p>	<p>Pages 14-18</p>
<p>13.4.07 Recognize that scientists share results so that each scientist may build upon what he or she learns from others.</p>	<p>FOSS Investigations encourage discussion and comparing of results so that students can learn from each other. See for example: Balance and Motion, Investigation 1, Parts 1-3 Plants and Animals Investigation 3, Part 2 Matter and Energy Investigation 4, Part 1 See also the FOSS Web Site and FOSS Science Stories for specific current and historical examples of scientists and their work; for example: <u>Structures of Life FOSS Science Stories</u> <u>Sun, Moon, and Stars FOSS Science Resources</u></p>	<p>Pages 8-23 Pages 129-134 Pages 174-180 www.fossweb.com “Careers” Pages 6-9 Pages 40-47</p>

<p>13.4.08 Understand that when an experiment is performed a few times and yields conflicting results, one must repeat it many times. Understand that one should also try to find an explanation for the conflicting results.</p>	<p>This standard is emphasized in ALL Grades 3-4 FOSS Modules. See for example: Magnetism and Electricity Investigation 1, Part 3 Measurement, Investigation 3, Part 1 Matter and Energy Investigation 4, Parts 1-3 Water Investigation 1, Part 2</p>	<p>Pages 23-29 Pages 8-13 Pages 174-204 Pages 14-18</p>
<p>SCIENCE, TECHNOLOGY, SOCIETY <i>(Standard B)</i></p>	<p><i>FOSS Investigations that prepare students for this assessment</i></p>	<p><i>Page Numbers</i></p>
<p>13.4.09 Identify important contributions to science and technology that have been made by individuals such as George Washington Carver, Jane Goodall, Wilbur and Orville Wright, Rachel Carson, Thomas Edison, Edward Jenner, Louis Pasteur, Anton von Leeuwenhoek, Elijah McCoy, Florence Nightingale, Daniel Hale Williams, Marie Curie, and Benjamin Franklin.</p>	<p><u>Magnetism and Electricity</u> FOSS Science Stories <u>Structures of Life</u> FOSS Science Stories <u>Water</u> FOSS Science Stories</p> <p><u>Ideas and Inventions</u> FOSS Science Stories <u>Sun, Moon, and Stars</u> FOSS Science Resources</p> <p>FOSS Web Site Note: the Wright Brothers are featured in readings in FOSS Variables, designed for Grades 5-6.</p>	<p>Pages 8-15 Franklin and Edison Pages 6-9 Barbara McClintock Pages 24-26 Ellen Swallow Richards Pages 1-3,9-10,18-22,25-29 multiple scientists/inventors Pages 40-47 Galileo www.fossweb.com “Careers”</p>
<p>13.4.10 Recognize that science and technology advance together.</p>	<p>This standard is addressed in ALL FOSS modules. It is particularly emphasized in Ideas and Inventions, such as Investigation 4, Parts 1-3 <u>Ideas and Inventions</u> FOSS Science Stories Sun, Moon, and Stars Investigation 3, Part 2 <u>Sun, Moon, and Stars</u> FOSS Science Resources Matter and Energy Investigation 4, Part 1 <u>Matter and Energy</u> FOSS Science Resources</p>	<p>Pages 8-21 Pages 1-29 Pages 126-135 Pages 40-47 Pages 174-180 Pages 1-7, 8-13</p>
<p>13.4.11 Identify occupations in the field of science.</p>	<p>This standard is addressed throughout ALL FOSS modules. See for example: Air and Weather Investigation 2, Parts 1-4</p> <p>And ALL Grades 3-4 Science Stories, such as <u>Measurement</u> FOSS Science Stories</p>	<p>Pages 8-27 and “Meteorologist Tool Kit” Pages 14-15</p>

	<p>Sun, Moon, and Stars Investigation 3, Part 2 <u>Sun, Moon, and Stars FOSS Science Resources</u> It is also emphasized on the FOSS Web Site.</p>	<p>Pages 126-135 Pages 44-46 www.fossweb.com "Careers"</p>
<p>13.4.12 Identify ways that science and technology affect people's lives (e.g., in transportation, medicine, agriculture, and communication) and careers (e.g., scientists discover a procedure or medication that can cure certain types of diseases; salt lowers the freezing temperature of water so the city street departments spread salt on icy streets during the winter).</p>	<p>This standard is addressed in Science Stories throughout ALL FOSS modules. See for example: <u>Air and Weather FOSS Science Stories</u> <u>Plants and Animals Investigation 1, Part 3 Plants and Animals FOSS Science Resources</u> <u>Physics of Sound FOSS Science Stories</u> <u>Water FOSS Science Stories</u> <u>Measurement FOSS Science Stories</u> Matter and Energy Investigation 1, Parts 1-3 <u>Matter and Energy FOSS Science Resources</u></p>	<p>Pages 14-17 weather forecasting Pages 63-77 Pages 9-15 Pages 25-29 hearing aids Pages 24-26 water quality Pages 14-15 Pages 50-84 Pages 1-7, 13</p>
<p>13.4.13 Identify the major advantages and drawbacks to each of the forms of energy which we can harness (e.g. solar, wind, fossil fuel, nuclear, and natural gas).</p>		
<p>13.4.14 Identify ways to reduce, reuse, and recycle materials.</p>	<p>Conservation of resources is stressed in ALL FOSS modules. See for example: <u>Plants and Animals Investigation 3, Part 2 Water,</u> Investigation 1, Parts 1-3 Investigation 4, Parts 3-4 <u>Water FOSS Science Stories</u> <u>Measurement FOSS Science Stories</u></p>	<p>Pages 128-134 Pages 8-23 Pages 19-28 Pages 17-21 Pages 16-17</p>
<p>MEASUREMENT (Standard C)</p>	<p><i>FOSS Investigations that prepare students for this assessment</i></p>	<p><i>Page Numbers</i></p>
<p>13.4.15 Know that using measuring tools results in greater accuracy than making estimates.</p>	<p>Estimation and accurate measurement tools and techniques are taught in depth in Measurement and then practiced in ALL FOSS Grades 3-4 modules. See for example: Measurement</p>	

	<p>Investigation 1, Parts 1-3 Investigation 2, Parts 1-3 Investigation 3, Parts 1-3 Investigation 4, Parts 1-2</p> <p>Water, Investigation 3, Parts 1-3</p> <p>Earth Materials, Investigation 1, Parts 1-2</p> <p>Matter and Energy Investigation 4, Part 1</p>	<p>Pages 8-24 length Pages 8-21 weight/mass Pages 8-21 volume Pages 8-17 temperature</p> <p>Pages 8-20</p> <p>Pages 8-23</p> <p>Pages 174-180</p>
<p>13.4.16 Identify basic scientific instruments and their functions (e.g. ruler, balance, graduated cylinder, clock or stopwatch, thermometer, microscope, and telescope).</p>	<p>Air and Weather Investigation 2, Parts 2-4</p> <p>Insects and Plants Investigation 3, Part 3</p> <p>Measurement Investigation 1, Parts 1-3</p> <p>Investigation 2, Parts 1-3 Investigation 3, Parts 1-3</p> <p>Investigation 4, Parts 1-3</p> <p>Earth Materials, Investigation 1, Parts 1-3</p> <p>Sun, Moon, and Stars Investigation 3, Part 2</p> <p><u>Sun, Moon, and Stars FOSS Science Resources</u></p> <p>Matter and Energy Investigation 3, Parts 1-3</p> <p><u>Matter and Energy FOSS Science Resources</u></p>	<p>Pages 14-27 thermometer, rain gauge</p> <p>Pages 145-152</p> <p>Pages 8-24 meter tapes/rulers Pages 8-21 balances Pages 8-21 graduated cylinders, beakers Pages 8-21 thermometers, stop watch Pages 8-29 meter tapes, balances</p> <p>Pages 126-132</p> <p>Pages 40-43</p> <p>Pages 129-160</p> <p>Pages 47-48, 51</p>
<p>13.4.17 Perform simple measurements [e.g., length (using rulers), volume (using graduated cylinders), weight (using scales), temperature (using thermometers), and time (using clocks or stopwatches)]. (On an assessment, read drawn depictions of such instruments.) Identify the metric units for the following measurements and symbols: m, cm, mm, l, mL, mg, kg, and degrees Celcius.</p>	<p>Measurement skills and metric units are taught in depth in Measurement and then practiced in ALL FOSS Grades 3-4 modules. See for example:</p> <p>Insects and Plants Investigation 3, Part 3</p> <p>Measurement Investigation 1, Parts 1-3 Investigation 2, Parts 1-3 Investigation 3, Parts 1-3 Investigation 4, Parts 1-3</p> <p>Water, Investigation 3, Parts 1-3</p> <p>Earth Materials, Investigation 1, Parts 1-3</p> <p>Matter and Energy Investigation 3, Parts 1-3</p>	<p>Pages 145-152</p> <p>Pages 8-24 length Pages 8-21 weight/mass Pages 8-21 volume Pages 8-17 temperature</p> <p>Pages 8-20</p> <p>Pages 8-29</p> <p>Pages 129-160</p>

Grade 7

Science - Goal 11

Understand the processes of scientific inquiry and technological design to investigation questions, conduct experiments, and solve problems.

<i>SCIENTIFIC INQUIRY</i> <i>(Standard A)</i>	<i>FOSS Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
11.7.01 Identify and be able to follow procedures to do scientific investigation including formulating hypotheses, controlling variables, collecting and recording and analyzing data, interpreting results, and reporting and displaying results.	<p>This standard is addressed in ALL FOSS modules. See for example:</p> <p>Variables ALL, such as Investigation 2, Parts 1-3 <u>Variables FOSS Science Stories</u></p> <p>Models and Designs Investigation 2, Parts 1-3</p> <p>Living Systems Investigation 2, Part 1</p> <p>Water Planet Investigation 2, Parts 2-3</p> <p>FOSS Web Site: simulations for ALL Grades 5-6 modules www.fossweb.com</p> <p><u>Populations and Ecosystems Resources</u></p> <p>Force and Motion Investigation 1, Parts 1-2</p> <p>Human Brain and Senses Investigation 7, Parts 1-3</p> <p>Planetary Science Investigation 5, Parts 1-3 <u>Planetary Science Resources</u></p>	<p>Pages 8-23</p> <p>Pages 1-6,34-37</p> <p>Pages 8-24</p> <p>Pages 85-98</p> <p>Pages 86-100</p> <p>Pages 8-13</p> <p>Pages 47-62</p> <p>Pages 210-230</p> <p>Pages 154-167 Pages 59-62</p>
11.7.02 Distinguish among – and perform – the following things: observation, drawing a conclusion based on an observation, forming a hypothesis, conducting an experiment, organizing data, constructing and reading charts and graphs, and comparing data.	<p>This standard is addressed in ALL FOSS modules at a developmentally appropriate level. See for example:</p> <p>Solar Energy Investigation 3, Parts 1-2</p> <p>Mixtures and Solutions Investigation 2, Parts 1-4</p> <p><u>Variables FOSS Science Stories</u></p> <p>Living Systems Investigation 3, Part 2</p> <p>Water Planet Investigation 2, Parts 2-3</p> <p>Force and Motion Investigation 5, Parts 1-4</p> <p>Electronics Investigation 2, Parts 1-4</p> <p>Diversity of Life Investigation 6, Parts 1-3</p>	<p>Pages 8-23</p> <p>Pages 8-28</p> <p>Pages 1-6, 34-37</p> <p>Pages 126-135</p> <p>Pages 86-100</p> <p>Pages 169-201</p> <p>Pages 89-108</p> <p>Pages 186-203</p>

<p>11.7.03 Define a theory as an explanation or model based on observation, experimentation, and reasoning: especially one that has been tested and confirmed as a general principle helping to explain and predict natural phenomena.</p>	<p>Models and Designs Investigation 1, Parts 1-3 <u>Models and Designs FOSS Science Stories</u> Food and Nutrition FOSS Science Stories Force and Motion Investigation 7, Parts 1-3 <u>Earth History Resources</u></p>	<p>Pages 8-25 Pages 1-16 Pages 21-26 Pages 256-272 Pages 81-87</p>
<p>11.7.04 Define a variable as some factor which changes in different phases of an experiment. For example, if we wish to observe how differences in pressure affect the temperature at which water boils, pressure will be a variable in our experiments. Define a constant as something kept the same in every phase of the experiment. Distinguish dependent and independent variables. Understand that most scientific experiments are designed so that only one variable is tested in each experiment. Identify constants and variables in described experiments.</p>	<p>This standard is addressed throughout FOSS modules Variables ALL such as Investigation 1, Parts 1-3 <u>Variables FOSS Science Stories</u> Environments Investigation 2, Parts 1-3 Living Systems Investigation 2, Part 2 <u>Living Systems FOSS Science Resources</u> Water Planet Investigation 2, Part 3 <u>Populations and Ecosystems Resources</u> Weather and Water Investigation 5, Parts 1-3 Diversity of Life Investigation 6, Parts 1-3 Force and Motion Investigation 5, Parts 2-4</p>	<p>Pages 8-27 Pages 1-3 Pages 10-25 Pages 85-98 Pages 27-30 Pages 93-100 Pages 8-13 Pages 152-175 Pages 186-203 Pages 177-201</p>
<p>11.7.05 Define control group or control setup as a group of subjects that are the same in all important ways as the subjects on which we are performing an experiment, except that the control is isolated from what we suspect to be the cause we are seeking to evaluate – the control helps to increase our certainty that the suspected cause really is the cause. Understand that there is a treatment sample and a control sample which is the same in every way except that it does not get the treatment.</p>	<p>Variables Investigation 4, Parts 1-3 <u>Variables FOSS Science Stories</u> Living Systems Investigation 1, Part 2 Mixtures and Solutions Investigation 4, Parts 1-3 Diversity of Life Investigation 6, Parts 1-3 Populations and Ecosystems Investigation 6, Parts 2-3 Force and Motion Investigation 5, Parts 2-4</p>	<p>Pages 8-23 Pages 1-3 Pages 60-65 Pages 8-24 Pages 186-203 Pages 187-197 Pages 177-201</p>

<p>11.7.06 Distinguish between the kinds of questions that can be investigated by the scientific method and those that cannot.</p>	<p>Living Systems Investigation 2, Parts 1-2 Water Planet Investigation 2, Parts 3-4 Planetary Science Investigation 4, Parts 1-4 Earth History Investigation 2, Parts 3-4 Populations and Ecosystems Investigation 7</p>	<p>Pages 85-106 Pages 93-110 Pages 120-140 Pages 102-111 Pages 210-218</p>
<p>11.7.07 Analyze patterns in data from an experiment to determine whether the information gathered helps to answer a given question or hypothesis. A simple example: if all of the plants fertilized in a vegetable garden grew taller than the ones not fertilized, understand that this is an indication that the fertilizer caused the plants to grow taller.</p>	<p>This standard is met in ALL FOSS modules as students record data on data sheets or in lab notebooks and compare data in class discussions. See for example: Environments Investigation 6, Parts 1-2 Food and Nutrition Investigation 2, Parts 1-3 Living Systems Investigation 3, Part 2 <u>Living Systems FOSS Science Resources</u> Water Planet Investigation 3, Part 1 Chemical Interactions Investigation 5, Part 1 Electronics Investigation 5, Parts 1-3 Planetary Science Investigation 5, Parts 1-3 Force and Motion Investigation 5, Parts 2-4 <u>Force and Motion Resources</u></p>	<p>Pages 8-14 Pages 8-25 Pages 126-135 Pages 27-30 Pages 125-135 Pages 153-158 Pages 161-175 Pages 154-167 Pages 177-201 Pages 36-40</p>
<p>TECHNOLOGICAL DESIGN (Standard B)</p>	<p><i>FOSS Investigations that prepare students for this assessment</i></p>	<p><i>Page Numbers</i></p>
<p>11.7.08 Identify a design problem and establish criteria for determining the success of a solution.</p>	<p>Models and Designs Investigation 2, Parts 1-3 Solar Energy Investigation 4, Parts 1-3 Electronics Investigation 6, Part 4 <u>Electronics CD-ROM</u> Force and Motion Investigation 8, Part 2</p>	<p>Pages 8-24 humdingers Pages 8-28 solar houses etc Pages 201-209 “Workbench” Pages 294-301</p>
<p>11.7.09 Compare design solutions; select which one is best given certain restrictions on available materials, tools, cost effectiveness, and safety.</p>	<p>Models and Designs Investigation 3, Parts 1-3 Investigation 4, Parts 1-2 Solar Energy Investigation 4, Parts 1-3 Chemical Interactions</p>	<p>Pages 8-23 Pages 6-15 Pages 8-28</p>

	Investigation 4, Part 1 Electronics Resources Planetary Science Investigation 7, Parts 1-5 Force and Motion Investigation 8, Part 2	Pages 122-129 Pages 18-21 Pages 218-237 Pages 294-301
11.7.10 Given certain tests which could be performed on a prototype, identify which one is testing for a given feature (e.g., “Given certain tests to be performed on a car, which one is testing for its fuel efficiency?”)	Models and Designs Investigation 3, Parts 1-3 Investigation 4, Parts 1-2 <u>Models and Designs FOSS</u> <u>Science Stories</u> Force and Motion Investigation 8, Part 2	Pages 8-23 Pages 6-15 Pages 17-20, 25-40 Pages 294-301
11.7.11 Identify improvements to a prototype indicated by given test results.	Models and Designs Investigation 3, Parts 1-3 Investigation 4, Parts 1-2 <u>Models and Designs FOSS</u> <u>Science Stories</u> Force and Motion Investigation 8, Part 2	Pages 8-23 Pages 6-15 Pages 17-20, 25-40 Pages 294-301

Science - Goal 12

Understand the fundamental concepts, principles, and interconnections of life, physical and earth/space sciences.

LIVING THINGS (STANDARD A)	<i>FOSS Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
Classification 12.7.01 Identify common insects, flowers, birds, reptiles, and mammals by their features.	This standard is met through ALL FOSS modules in Life Science strand, such as Environments Investigation 2, Parts 1-4 <u>Environments FOSS Science Stories</u> Living Systems Investigation 2, Part 2 Diversity of Life throughout, such as Investigation 7, Parts 1-2 Investigation 9, Parts 1-3 <u>Diversity of Life Resources</u> <u>Diversity of Life CD-ROM</u> Populations and Ecosystems Investigation 3, Parts 1-3 Investigation 7 <u>Populations and Ecosystems Resources</u> <u>Populations and Ecosystems CD-ROM</u>	Pages 10-30 Pages 1-35, 38, 39-42 Pages 100-106 Pages 218-229 plants Pages 273-290 insects Pages 17, 21-64 Database Pages 90-107 Pages 210-218 Pages 32-41, 58-68 Ecoscenarios
12.7.02 Understand that animals have parts well suited to the places they live in and to their needs. For	This standard is met through ALL FOSS modules in Life Science strand, such as Environments	

<p>example, rabbits radiate heat through their ears, and those living in hotter climates have larger ears to radiate heat more efficiently. Thus, given a list of animals, one of which is clearly better adapted to a given environment, understand that this is the animal which lives in that environment.</p>	<p>Investigation 5, Parts 1-3 <u>Environments FOSS Science Stories</u> Diversity of Life throughout, such as Investigation 7, Parts 1-2 Investigation 9, Parts 1-3 <u>Diversity of Life Resources</u> <u>Diversity of Life CD-ROM</u> Populations and Ecosystems Investigation 7 Investigation 8, Parts 1-2 <u>Populations and Ecosystems Resources</u> <u>Populations and Ecosystems CD-ROM</u></p>	<p>Pages 8-22 Pages 1-35, 38, 39-42 Pages 218-229 plants Pages 273-290 insects Pages 17, 21-64 Database Pages 210-218 Pages 228-243 adaptation Pages 32-41, 58-68 Ecoscenarios</p>
<p>Cell Biology 12.7.03 Understand that all living things are composed of cells: small parts which function similarly in all living things. Understand that different tissues have different, specialized cells with specific functions.</p>	<p>Living Systems Investigation 1, Part 1 <u>Living Systems FOSS Science Stories</u> This standard is a focus of Diversity of Life. See for example: Diversity of Life Investigation 3, Part 1 Investigation 4, Parts 1-2 <u>Diversity of Life Resources</u> <u>Diversity of Life CD-ROM</u> Human Brain and Senses Investigation 8, Parts 1-2</p>	<p>Pages 51-59 Pages 1, 2, 5-6, 11, 16-20 Pages 102-107 Pages 133-141 Pages 8-9, 24-26, 27-30, 37 Pages 240-252</p>
<p>12.7.04 Identify the main differences between plant cells and animal cells, namely that plant cells have chloroplasts and cell walls (which provide rigidity to the plant, since plants have no skeletons). Identify the basic cell organelles and their functions: membrane, nucleus, cytoplasm, chloroplast, mitochondria, and vacuoles.</p>	<p>Diversity of Life Investigation 3, Parts 1-3 Investigation 4, Parts 1-2 Investigation 5, Part 3 <u>Diversity of Life Resources</u> <u>Diversity of Life CD-ROM</u></p>	<p>Pages 102-124 Pages 133-141 Pages 165-171 Pages 27-30, 35-39 “Ribbon of Life”</p>

12.7.05 Understand that some organisms are unicellular, others multicellular. Understand that some unicellular organisms are like tiny animals, able to propel themselves or change their shape, and that they are endowed with sensation.	<p>Living Systems Investigation 1, Part 1 <u>Living Systems FOSS Science Stories</u></p> <p>Diversity of Life Investigation 2, Parts 2-3 Investigation 3, Parts 1-3 <u>Diversity of Life Resources</u></p> <p><u>Diversity of Life CD-ROM</u></p>	<p>Pages 51-59</p> <p>Page 11</p> <p>Pages 79-92 Pages 102-124 Pages 4-9,24-26,27-30, 65-70 “Ribbon of Life”</p>
12.7.06 Understand that the nucleus of cell contains the genetic information for the plant or animal to which it belongs.	<p>Diversity of Life Investigation 4, Parts 1-2 Investigation 5, Part 3 <u>Diversity of Life Resources</u></p> <p><u>Diversity of Life CD-ROM</u></p>	<p>Pages 133-141 Pages 165-171 Pages 27-30 “Ribbon of Life”</p>
12.7.07 Understand that cells divide to increase their numbers, and the process of cell division called mitosis results in two daughter cells each with identical sets of chromosomes.	<p>Diversity of Life Investigation 10, Parts 1-2 <u>Diversity of Life Resources</u></p> <p><u>Diversity of Life CD-ROM</u></p> <p>Populations and Ecosystems Resources</p>	<p>Pages 302-316 Page 26</p> <p>Page 53</p>
12.7.08 Understand that multicellular organisms begin as zygotes (a single egg cell fertilized by a single sperm cell), and that a zygote grows by cell division, and that as the cells multiply, they also differentiate.	<p>Populations and Ecosystems Investigation 9, Parts 1-4 <u>Populations and Ecosystems Resources</u></p>	<p>Pages 262-291</p> <p>Pages 46-54</p>
Genetics and Reproduction 12.7.09 Understand the distinction between sexual and asexual reproduction. Understand that only some animals are capable of limb-regeneration (e.g. sea stars, some amphibians, and many crustaceans).	<p>Populations and Ecosystems Investigation 9, Parts 1-4 <u>Populations and Ecosystems Resources</u></p> <p><u>Diversity of Life Resources</u></p>	<p>Pages 262-291</p> <p>Pages 46-54 Pages 26,40-44,53-54,61-64</p>
12.7.10 Understand that the offspring of sexual reproduction inherits half its genes from each parent.	<p>Populations and Ecosystems Investigation 9, Parts 1-4 <u>Populations and Ecosystems Resources</u></p> <p><u>Populations and Ecosystems CD-ROM</u></p> <p><u>Diversity of Life Resources</u></p>	<p>Pages 262-291</p> <p>Pages 46-54</p> <p>Larkeys Pgs 26,40-44, 53-54, 61-64</p>
12.7.11 Understand that an inherited trait can be determined by one or more genes	<p>Populations and Ecosystems Investigation 9, Parts 1-4 <u>Populations and Ecosystems Resources</u></p> <p><u>Populations and Ecosystems CD-ROM</u></p>	<p>Pages 262-291</p> <p>Pages 46-54</p> <p>Larkeys</p>
12.7.12 Understand that DNA (deoxyribonucleic	<p>Populations and Ecosystems Investigation 9, Parts 1-4</p>	<p>Pages 262-291</p>

acid) is the genetic material of each living thing – like a blueprint or set of instructions for building the organisms – and that it is located in the chromosomes of each cell.	<u>Populations and Ecosystems Resources</u> <u>Populations and Ecosystems CD-ROM</u> <u>Models and Designs FOSS</u> <u>Science Stories</u>	Pages 46-54 Larkeys Page 4
12.7.13 Understand the basic rules of heredity: namely that the offspring of two mated animals (or plants) will have a certain probability of inheriting a given trait for which one or both of the parents carries a gene, and that this probability can be calculated given the genetic makeup of the parents with regard to that kind of trait (e.g. blue eyes).	Populations and Ecosystems Investigation 9, Parts 1-4 <u>Populations and Ecosystems Resources</u> <u>Populations and Ecosystems CD-ROM</u>	Pages 262-291 Pages 46-54 Larkeys
12.7.14 Understand that male animals produce sperm cells, and females produce egg cells, and that the combination of these cells resulting from sexual union becomes the offspring.	Populations and Ecosystems Investigation 9, Parts 1-4 <u>Populations and Ecosystems Resources</u> <u>Populations and Ecosystems CD-ROM</u>	Pages 262-291 Pages 46-54 Larkeys
12.7.15 Understand the basics of plant reproduction and define and state the purposes of pollen, ovules, seeds, and fruit.	Diversity of Life Investigation 5, Parts 1-2 Investigation 7, Parts 1-2 <u>Diversity of Life Resources</u> <u>Populations and Ecosystems Resources</u>	Pages 151-164 Pages 218-229 Pages 31-34,40-50 Pages 46-49
Botany 12.7.16 Identify the common characteristics of most plants: they nearly all have green parts, many are woody, the majority have flowers, and unlike animals, nearly all plants live their lives rooted to one place in the soil.	<u>Living Systems FOSS Science Stories</u> Diversity of Life Investigation 5, Parts 1-3 Investigation 7, Parts 1-2 <u>Diversity of Life Resources</u> <u>Diversity of Life CD-ROM</u>	Pages 16-20, 31-34 Pages 151-171 Pages 218-229 Pages 31-50
12.7.17 Understand that energy for life primarily derives from the sun; understand the process of photosynthesis.	Living Systems Investigation 3, Part 1 <u>Living Systems FOSS Science Stories</u> Populations and Ecosystems Investigation 5, Parts 1-4 Investigation 6, Part 2 <u>Populations and Ecosystems Resources</u> <u>Diversity of Life Resources</u>	Pages 118-125 Pages 31-34, 47--49 Pages 142-169 Pages 187-190 Pages 14-24 Pages 36-39

<p>12.7.18 Identify the basic anatomy of leaves: blade, vein, and petiole; classify leaves as dicot or monocot, simple or compound, and palmately compound or pinnately compound.</p>	<p>Living Systems Investigation 2, Part 2 <u>Living Systems FOSS Science Stories</u> Diversity of Life Investigation 5, Part 2</p> <p><i>Leaf anatomy is also addressed in the FOSS module Ideas and Inventions, designed for Grades 3-4.</i></p>	<p>Pages 99-106 Pages 21-25 Pages 157-164</p>
<p>12.7.19 Classify roots as either fibrous roots or tap roots.</p>	<p>Diversity of Life Resources</p>	<p>Pages 31-34</p>
<p>12.7.20 Understand that flowers are the reproductive organs of flowering plants and that their function is to produce male gametes (sperm) and female gametes (eggs) and to provide a structure for fertilization.</p>	<p>Diversity of Life Investigation 7, Part 1 <u>Diversity of Life Resources</u> <u>Diversity of Life CD-ROM</u></p>	<p>Pages 218-223 Pages 40-45</p>
<p>12.7.21 Understand that some of the structures of flowers are adaptations that enable plants to reproduce sexually while they remain stationary. Understand that a plant's production of pollen is one such adaptation, since it can be transported (by wind, water, insects, or other organisms) to the parts of the flowers that contain eggs. Know that this process is called pollination.</p>	<p>Diversity of Life Investigation 7, Part 2 <u>Diversity of Life Resources</u> <u>Diversity of Life CD-ROM</u></p>	<p>Pages 224-229 Pages 40-50</p>
<p>12.7.22 Identify a seed as a reproductive structure consisting of a plant embryo and its stored food. Understand that in flowering plants the seeds develop in a structure called a fruit, which houses and protect seeds and may also help to disperse them to new locations.</p>	<p>Diversity of Life Investigation 5, Parts 1-3 <u>Diversity of Life Resources</u></p>	<p>Pages 151-171 Pages 31-34, 40-45</p>

<p>Change Over Time 12.7.23 Understand that competitive feeding habits between species can have a negative effect on their populations. Understand that animals and plants compete for food, shelter, mates, and other things necessary for life and reproduction.</p>	<p>Populations and Ecosystems Investigation 4, Parts 1-2 Investigation 6, Parts 1-3 <u>Populations and Ecosystems Resources</u></p>	<p>Pages 119-129 Pages 179-197 Pages 17-24,25-29</p>
<p>12.7.24 Know what natural selection or survival of the fittest is, and understand that this is thought to be one of the explanations for how animals and plants change over time, and that it was the explanation given by Charles Darwin.</p>	<p>Populations and Ecosystems Investigation 10, Parts 1-3 <u>Populations and Ecosystems Resources</u> <u>Populations and Ecosystems CD-ROM</u> <u>Earth History Resources</u></p>	<p>Pages 302-317 Pages 58-63 Walkingsticks, Larkeys Pages 83-87</p>
<p>12.7.25 Understand that fossils of complete skeletons are rare, and that many skeletons have to be reconstructed based on what scientists believed the whole body to look like. Understand that the fossil record is not complete or representative of the times in which the fossilized animals and plants lived.</p>	<p><u>Models and Designs FOSS</u> <u>Science Stories</u> Earth History Investigation 7, Parts 1-2 <u>Earth History Resources</u> <u>Earth History CD-ROM</u></p>	<p>Pages 11-16 Pages 234-244 Pages 38-41, 73-75, 76-82, 83-87</p>
<p>12.7.26 Understand how fossils provide evidence that animals and plants have changed over time, and that new species or organisms changed over time out of older ones.</p>	<p>Earth History Investigation 7, Parts 1-2 <u>Earth History Resources</u> <u>Earth History CD-ROM</u></p>	<p>Pages 234-244 Pages 38-41, 73-75, 76-82, 83-87</p>
<p>12.7.27 Identify the temporal order in which major groups of organisms are thought to have appeared on earth: 1. bacteria and other unicellular organisms, 2. invertebrate animals (trilobites, sponges), 3. jawless fishes, then fishes with jaws, 4. reptiles, 5. flowering plants, 6. mammals, and 7. people and modern animals.</p>	<p>Earth History Investigation 7, Parts 1-2 <u>Earth History Resources</u> <u>Earth History CD-ROM</u> <u>Diversity of Life Resources</u></p>	<p>Pages 234-244 Pages 38-41, 73-75, 76-82, 83-87 Pages 27-30,65-70</p>

<p>12.7.28 Understand how comparative anatomy offers evidence that organisms have changed over time. (1) Assuming that organisms have changed over time offers some explanation for similarities in body structures of different species by proposing that they descended from the same parent-species. (2) The same assumption can explain vestigial organs by proposing that new organs can make older organs obsolete or unnecessary, which therefore become disused and smaller (like the vestigial legs on some snakes).</p>	<p><u>Populations and Ecosystems Resources</u></p>	<p>Pages 42-45, 58-63</p>
<p><i>ENVIRONMENT AND INTERACTION OF LIVING THINGS</i> <i>(Standard B)</i></p>	<p><i>FOSS Investigations that prepare students for this assessment</i></p>	<p><i>Page Numbers</i></p>
<p>12.7.29 Understand that three important cycles for the survival of living things in Earth’s ecosystems are the carbon dioxide-oxygen cycle, the water cycle, and the nitrogen cycle.</p>	<p><u>Populations and Ecosystems</u> Investigation 5, Parts 2-4 Investigation 6, Parts 1-3 <u>Populations and Ecosystems Resources</u> <u>Weather and Water</u> Investigation 7, Parts 1-2 <u>Weather and Water Resources</u> <u>Weather and Water CD-ROM</u></p>	<p>Pages 151-169 Pages 179-197 Pages 14-24 Pages 232-244 Pages 45-47, 63-66 Water Cycle Game</p>
<p>12.7.30 Understand that the number of organisms an ecosystem can support depends on the resources available and abiotic factors (e.g. the quantity of light and water, the range of temperatures, and soil composition). Know that given adequate biotic and abiotic resources and no disease or predators, populations can increase at rapid rates. Understand that lack of resources and other factors (e.g. predation and climate) limit the growth of populations in specific niches in the ecosystem.</p>	<p><u>Environments</u> Investigation 1, Parts 1-2 <u>Populations and Ecosystems</u> Investigation 5, Parts 2-4 Investigation 6, Parts 1-3 Investigation 7 <u>Populations and Ecosystems Resources</u> <u>Populations and Ecosystems CD-ROM</u></p>	<p>Pages 8-19 Pages 151-169 Pages 179-197 Pages 210-218 Pages 6-7, 8-13, 14-24 “Ecoscenarios”</p>

<p>12.7.31 Understand that competitive feeding habits between species can have a negative effect on their populations. Understand that animals and plants compete for food, shelter, mates and other things necessary for life and reproduction.</p>	<p>Populations and Ecosystems Investigation 3, Parts 1-3 Investigation 6, Parts 1-3 Investigation 7 <u>Populations and Ecosystems Resources</u> <u>Populations and Ecosystems CD-ROM</u></p>	<p>Pages 90-107 Pages 179-197 Pages 210-218 Pages 6-7, 8-13, 14-24 “Ecoscenarios”</p>
<p>12.7.32 Distinguish the various members of a food web and identify the order of dependence among these members.</p>	<p><u>Environments FOSS Science Stories</u> Living Systems Investigation 3, Part 1 Populations and Ecosystems Investigation 4, Parts 1-2 Investigation 5, Parts 2-4 Investigation 7 <u>Populations and Ecosystems Resources</u> <u>Populations and Ecosystems CD-ROM</u></p>	<p>Page 41 Pages 118-125 Pages 119-129 Pages 151-169 Pages 210-218 Pages 17-41 “Ecoscenario” and Mono Lake Food Web simulatn’s</p>
<p>12.7.33 Understand that many plants depend upon certain animals for pollination and the spreading out of their seeds, and therefore to reproduce. Conversely, understand that animals depend on plants for food (either immediately, like herbivores; or intermediately, like carnivores) and shelter.</p>	<p><u>Environments FOSS Science Stories</u> <u>Diversity of Life Resources</u> Populations and Ecosystems Investigation 5, Parts 2-4 Investigation 7 <u>Populations and Ecosystems Resources</u> <u>Populations and Ecosystems CD-ROM</u></p>	<p>Pages 53-55 Pages 46-50 Pages 151-169 Pages 210-218 Pages 17-41 Mono Lake and “Ecoscenario” Food Web simulations</p>
<p>12.7.34 Understand that the behavior of different organisms is influenced by internal cues (e.g. hunger) and by external cues (e.g. change in the environment).</p>	<p>Diversity of Life Investigation 2, Parts 2-3 Investigation 3, Parts 1-3 <u>Diversity of Life Resources</u> Human Brain and Senses Investigation 1, Parts 1-4 Investigation 8, Parts 1-2</p>	<p>Pages 72-92 Pages 102-124 Pages 21-26 Pages 37-59 Pages 240-252</p>
<p>12.7.35 Identify and describe the basic kinds of habitats: freshwater vs. saltwater, river, pond, desert, forest, and prairie.</p>	<p>Populations and Ecosystems Investigation 7 <u>Populations and Ecosystems Resources</u> <u>Populations and Ecosystems CD-ROM</u></p>	<p>Pages 210-218 Pages 8-13,30-41 “Ecoscenarios”</p>
<p>12.7.36 Identify and describe the major biomes and their characteristics: desert, grassland, savannah, tropical forest, coniferous forest, and tundra.</p>	<p><u>Environments FOSS Science Stories</u> Populations and Ecosystems Investigation 7 <u>Populations and Ecosystems Resources</u> <u>Populations and Ecosystems CD-ROM</u></p>	<p>Pages 9-17, 27-35 Pages 210-218 Pages 8-13,30-41 “Ecoscenarios”</p>

MATTER AND ENERGY <i>(Standard C)</i>	<i>FOSS Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
<p>Properties of Matter 12.7.37 Understand that matter can be changed in different ways.</p> <p>1. Physically, a change in the size shape or state of matter (e.g., the melting of an ice cube, tearing of paper).</p> <p>2. Chemically, where matter can change into another kind of matter (e.g., burning of wood, rusting of iron).</p>	<p>Living Systems Investigation 3, Parts 1-2 <u>Living Systems FOSS Science Stories</u></p> <p>Mixtures and Solutions Investigation 2, Parts 1-4 Investigation 4, Parts 1-3 <u>Mixtures and Solutions FOSS Science Stories</u></p> <p>Weather and Water Investigation 6, Parts 1-4 <u>Weather and Water Resources</u></p> <p>Earth History Investigation 5, Parts 1-2</p> <p>Chemical Interactions Investigation 7, Parts 1-5 Investigation 8, Parts 1-3 <u>Chemical Interactions Resources</u></p>	<p>Pages 118-135</p> <p>Pages 27-34</p> <p>Pages 8-28 Pages 8-24</p> <p>Pages 16-17, 21-22</p> <p>Pages 190-213 Pages 34-36, 45-47</p> <p>Pages 175-182</p> <p>Pages 204-234 Pages 248-268</p> <p>Pages 16-17, 42-48, 63-68</p>
<p>12.7.38 Define and distinguish the following properties of matter: mass, weight, volume, density, color, odor, shape, texture and hardness.</p>	<p>Living Systems Investigation 3, Parts 1-3</p> <p>Mixtures and Solutions Investigation 1, Parts 1-2 <u>Water Planet FOSS Science Resources</u></p> <p>Planetary Science Investigation 8, Parts 1-4</p> <p>Chemical Interactions Investigation 3, Parts 1-3 Investigation 8, Parts 1-3 <u>Chemical Interactions Resources</u></p>	<p>Pages 118-144</p> <p>Pages 8-20</p> <p>Pages 52-57, 58-61</p> <p>Pgs 250-270 Moon Rocks</p> <p>Pages 92-113 Pages 248-268</p> <p>Page 16</p>
<p>12.7.39 Understand that the phases of matter depend on how the atoms and molecules of a substance move.</p>	<p><u>Water Planet FOSS Science Resources</u></p> <p>Weather and Water Investigation 4, Parts 1-2 Investigation 6, Parts 1-4 <u>Weather and Water Resources</u></p> <p>Chemical Interactions Investigation 3, Parts 1-3 <u>Chemical Interactions Resources</u></p>	<p>Pages 26-27, 28-30, 38-40</p> <p>Pages 121-140 Pages 190-213 Pages 22-31</p> <p>Pages 92-113</p> <p>Pages 42-48</p>
<p>12.7.40 Identify the most familiar elements which are gases at room temperature.</p>	<p><u>Water Planet FOSS Science Resources</u></p> <p>Chemical Interactions Investigation 2, Parts 1-2 <u>Chemical Interactions Resources</u></p>	<p>Page 58</p> <p>Pages 70-81</p> <p>Pages 11, 95</p>

<p>12.7.41 Know the definitions of melting point and boiling point and understand the concepts of evaporation and sublimation.</p>	<p>Water Planet Investigation 2, Parts 1-4 <u>Water Planet FOSS Science Resources</u> Weather and Water Investigation 6, Parts 1-3 Investigation 7, Parts 1-2 Chemical Interactions Investigation 7, Parts 1-5 <u>Chemical Interactions Resources</u></p>	<p>Pages 80-112 Pages 26-27 Pages 190-205 Pages 232-244 Pages 204-234 Pages 42-48</p>
<p>12.7.42 Understand that there is another state of matter called plasma, which can be produced under artificial conditions on Earth. The sun's matter is in the plasma state, as is the matter of the other stars.</p>		
<p>12.7.43 Understand that substances can be grouped by similarities in their physical properties.</p>	<p><u>Mixtures and Solutions FOSS</u> <u>Science Stories</u> Chemical Interactions Investigation 2, Parts 1-2 <u>Chemical Interactions Resources</u></p>	<p>Pages 26-30 Pages 70-81 Pages 3-8, 90-91</p>
<p>12.7.44 Define element as a substance that cannot be broken down into simpler substances by chemical interactions. Understand that there are over 100 known elements that combine in many ways to form many kinds of compounds.</p>	<p><u>Mixtures and Solutions FOSS</u> <u>Science Stories</u> Chemical Interactions Investigation 2, Parts 1-2 <u>Chemical Interactions Resources</u></p>	<p>Pages 3-6, 26-30 Pages 70-81 Pages 14-15</p>
<p>12.7.45 Identify the properties common to most metals (especially luster, malleability, ductility, and the ability to conduct electricity). Identify the most familiar metals on the periodic table and understand that they are: magnesium, aluminium, titanium, iron, nickel, copper, zinc, silver, platinum, gold and mercury.</p>	<p>Chemical Interactions Investigation 2, Parts 1-2 Chemical Interactions CD-Rom</p>	<p>Pages 70-81</p>
<p>12.7.46 Identify simple compounds (e.g. H₂O).</p>	<p><u>Mixtures and Solutions FOSS</u> <u>Science Stories</u> Living Systems Investigation 3, Part 1 <u>Populations and Ecosystems</u> <u>Resources</u> Chemical Interactions Investigation 9, Part 1</p>	<p>Pages 6-8 Pages 118-125 Pages 14-16 Pages 280-287</p>

	<u>Chemical Interactions Resources</u>	Pages 14-15
The Atom 12.7.47 Define atom as the smallest part of an element that still has the properties of that element.	<u>Mixtures and Solutions FOSS Science Stories</u> <u>Water Planet FOSS Science Resources</u> Chemical Interactions Investigation 9, Part 1 <u>Chemical Interactions Resources</u>	Pages 3-6, 26-30 Page 101 Pages 280-287 Pages 64-68
12.7.48 Identify the 3 subatomic building blocks, namely the electron, proton, and neutron. Know that the electron has a negative charge, the proton has a positive charge, and the neutron is electrically neutral.		
12.7.49 Understand that a molecule is two or more atoms joined by bonds. Understand that it is possible to have a molecule of an element, if the atoms are all of the same element, or a molecule of a compound, if the elements in it are of different elements.	Living Systems Investigation 3, Part 1 <u>Living Systems FOSS Science Stories</u> <u>Water Planet FOSS Science Resources</u> <u>Populations and Ecosystems Resources</u> Chemical Interactions Investigation 9, Part 1 <u>Chemical Interactions Resources</u>	Pages 118-125 Page 33 Page 28 Pages 14-16 Pages 280-287 Page 105
12.7.50 Identify the number of different kinds of elements in a chemical formula. Understand that water is a chemical compound, and that its formula is H ₂ O.	<u>Living Systems FOSS Science Stories</u> <u>Water Planet FOSS Science Resources</u> <u>Populations and Ecosystems Resources</u> Chemical Interactions Investigation 9, Parts 1-4 <u>Chemical Interactions Resources</u>	Page 33 Page 28 Pages 14-16 Pages 280-312 Pages 63-68
12.7.51 Understand that during a chemical change atoms are neither created nor destroyed, but are rearranged to make new substances.	<u>Mixtures and Solutions FOSS Science Stories</u> Chemical Interactions Investigation 9, Parts 1-4 <u>Chemical Interactions Resources</u>	Pages 21-22 Pages 280-312 Pages 63-68

<p>Acids and Bases 12.7.52 Identify the basic properties of acids and bases (e.g. acids are found in fruits such as apples, oranges, grapes and lemons). Know that bases are found in products such as lye soap, deodorant, and ammonia. Know the relationship between acids, bases, and indicators (e.g. blue litmus paper changes to red when placed in an acid).</p>	<p><u>Mixtures and Solutions FOSS Science Stories</u> Food and Nutrition Investigation 3, Parts 1-3 <u>Food and Nutrition FOSS Science Stories</u></p>	<p>Pages 14-15 Pages 8-25 (citric acid) Pages 24-25</p>
<p>Energy 12.7.53 Know the laws of conservation of matter and energy. Apply the conservation of matter as a reason why the number and kinds of atoms in a chemical change remains constant.</p>	<p>Living Systems Investigation 3, Part 1 Chemical Interactions Investigation 9, Parts 1-3 <u>Chemical Interactions Resources</u></p>	<p>Pages 118-125 Pages 281-307 Pages 33, 63-68</p>
<p>12.7.54 Understand that energy is anything that can change the condition of matter, such as heat, light, sound, mechanical motion, and electricity.</p>	<p>Living Systems Investigation 3, Part 1 <u>Living Systems FOSS Science Stories</u> <u>Solar Energy FOSS Science Stories</u> <u>Water Planet FOSS Science Resources</u> Chemical Interactions Investigation 7, Parts 1-5 <u>Chemical Interactions Resources</u></p>	<p>Pages 118-125 Pages 31-34 Pages 1-4, 16-17, 22-32 Pages 42-45 Pages 204-234 Pages 24-27, 32-37</p>
<p>12.7.55 Understand that heat moves in predictable ways, flowing from warmer objects to cooler ones, until both reach the same temperature (thermal equilibrium).</p>	<p>Solar Energy Investigation 2, Parts 1-2 Investigation 4, Parts 1-3 Water Planet Investigation 3, Part 2 Weather and Water Investigation 4, Parts 1-2 Investigation 5, Parts 1-3 <u>Weather and Water Resources</u> Chemical Interactions Investigation 7, Parts 1-5 <u>Chemical Interactions Resources</u></p>	<p>Pages 8-24 (heat flow) Pages 8-28 Pages 136-144 Pages 121-140 Pages 152-175 Pages 22-33, 63-66 Pages 204-234 Pages 32-37</p>
<p>12.7.56 Understand that energy can be transferred by radiation, conduction, and convection.</p>	<p>Solar Energy Investigation 3, Parts 1-2 Investigation 4, Parts 1-3 <u>Solar Energy FOSS Science Stories</u> Water Planet Investigation 3, Parts 1-2</p>	<p>Pages 8-23 Pages 8-28 Pages 1-4, 16-24, 26-32 Pages 125-144</p>

	<p>Chemical Interactions Investigation 5, Part 2 <u>Chemical Interactions Resources</u></p> <p>Weather and Water Investigation 4, Parts 1-2 Investigation 5, Parts 1-3 <u>Weather and Water Resources</u></p>	<p>Pages 159-164</p> <p>Pages 34, 103, 105</p> <p>Pages 121-140 Pages 152-175 Pages 22-33, 63-66</p>
<p>12.7.57 Identify what electrical conductors and insulators are; define and give examples of each. Understand that electricity can be converted into heat and light by forcing an electrical current through a conductor. Understand that this is what happens in a toaster and in a light bulb.</p>	<p>Electronics Investigation 1, Parts 1-5 Investigation 4, Part 1 <u>Electronics Resources</u></p>	<p>Pages 55-80 Pages 143-148 Pages 1-2,6-15</p>
<p>Light 12.7.58 Understand that light travels in straight lines as long as it is travelling through one, uniform medium.</p>	<p>Human Brain and Senses Investigation 3, Parts 1-2 <u>Human Brain and Senses Resources</u> <u>Human Brain and Senses CD-ROM</u></p>	<p>Pages 92-105</p> <p>Pages 31-35</p> <p>“Optics Bench”</p>
<p>12.7.59 Understand that almost all of Earth’s energy comes from the sun. Understand that this energy is in the form of visible and invisible light with a range of wavelengths including infrared, ultraviolet, radio waves and xrays.</p>	<p>Solar Energy FOSS Science Stories <u>Water Planet FOSS Science Resources</u></p> <p>Weather and Water Investigation 3, Parts 1-3 <u>Weather and Water Resources</u> <u>Weather and Water CD-ROM</u></p>	<p>Pages 1-5</p> <p>Pages 42-45</p> <p>Pages 93-112 Pages 17-19, 22-26</p>
<p>12.7.60 Understand that visible light is a small band within a very broad electromagnetic spectrum.</p>	<p><u>Human Brain and Senses CD-ROM</u></p>	
<p>12.7.61 Understand that when a light beam hits an object and is reflected off of it, the angle of incidence equals the angle of reflection.</p>	<p>Human Brain and Senses Resources</p>	<p>Pages 31-33</p>
<p>12.7.62 Understand that light travels at different speeds in different materials. Understand that this is why light refracts – or changes direction – namely because it goes from one material in which it moves at one speed into another material through which it moves at a different speed.</p>	<p><u>Human Brain and Senses Resources</u> <u>Human Brain and Senses CD-ROM</u></p>	<p>Pages 31-33</p>

12.7.63 Understand that the angle of refraction is determined by (1) the angle of incidence and (2) the index of refraction of the new material which the light is entering.	<u>Human Brain and Senses Resources</u> <u>Human Brain and Senses CD-ROM</u>	Pages 31-33
12.7.64 Understand that many lenses operate by refracting light beams that hit their surface in such a way that they will all meet at one point called a focal point. Understand that this is the way refracting telescopes increase the ability of an object to be magnified (namely by brightening it; its objective lens focusing much more light from the object than the human eye can take in), and this is also how they magnify it with another lens. Likewise, know that light microscopes and magnifying glasses work in the same way.	<u>Solar Energy FOSS Science Stories</u> <u>Human Brain and Senses Resources</u> <u>Human Brain and Senses CD-ROM</u>	Pages 4-5,15 Pages 31-35
12.7.65 Understand that light has a dual nature – exhibiting particle properties and also wave properties – depending on what situation we observe it in.	<u>Human Brain and Senses CD-ROM</u>	
12.7.66 Identify the basic properties of waves: frequency, wavelength, and velocity.	<u>Human Brain and Senses CD-ROM</u> <i>Waves and Energy is also addressed in the FOSS module Matter and Energy, designed for Grades 3-4.</i>	
12.7.67 Understand that in the spectrum of visible light, lower frequency colors are toward red, and higher frequency colors are toward blue.	<u>Human Brain and Senses CD-ROM</u>	
<i>FORCE AND MOTION (Standard D)</i>	<i>FOSS Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
12.7.68 Understand the concept of force as any influence that tends to accelerate an object. Know that a force, for example, can speed up an object, or slow it down, or change its direction. Understand that forces can be	Water Planet Investigation 1, Part 2 <u>Water Planet FOSS Science Resources</u> Force and Motion Investigation 7, Parts 1-3 <u>Force and Motion Resources</u>	Pages 59-69 Pages 16-17 Pages 256-272 Pages 50-52

quantified or measured in various ways, but in particular spring scales can be used.		
12.7.69 Understand the concept of constant, variable, and periodic motions.	<u>Force and Motion Resources</u>	Pages 32-35
12.7.70 Identify the principle of inertia: things at rest or in uniform motion in a straight line tend to stay at rest or in uniform motion in a straight line unless some force is applied to them. Know that this is Isaac Newton's first law of motion. Recognize examples of inertia: for example, when people are travelling in a car that comes to a sudden stop, they lunge forward (since they have a tendency to continue in the uniform motion they were in, and they must be decelerated). Identify Newton's second law of motion (force = mass x acceleration). Identify the third law, which states that for every action there is an equal and opposite reaction.	<u>Force and Motion Resources</u>	Pages 50-52, 75
12.7.71 Understand the concept of work and recognize applications of simple machines (wedge, pulley, lever, screw, and inclined plane) in common tools.	Levers and Pulleys ALL , such as Investigation 1, Parts 1-3 Investigation 2, Parts 1-4 <u>Levers and Pulleys FOSS Science Stories</u>	Pages 8-28 Pages 8-24 Pages 1-17, 21-32
12.7.72 Understand that density is mass per volume, and that what is denser than something else at the same volume will have more mass, but at the same mass will have less volume. Understand that less dense bodies have greater buoyant force in water.	Variables FOSS Science Stories Water Planet Investigation 3, Part 2 <u>Water Planet FOSS Science Resources</u> Weather and Water Investigation 5, Parts 1-3 <u>Weather and Water Resources</u> Chemical Interactions Investigation 8, Part 3 <u>Chemical Interactions Resources</u>	Pages 10-14 Pages 136-144 Pages 52-57, 58-61 Pages 152-175 Pages 27-33, 53-55 Pages 264-268 Page 104

12.7.73 Understand that the gravitational force between two bodies decreases as the bodies get farther apart from each other. Know that the gravitational force between two bodies decreases as their masses decrease.	Water Planet Investigation 1, Part 2 <u>Force and Motion Resources</u> <u>Planetary Science Resources</u>	Pages 59-69 Pages 62-69 Pages 69-70, 97-100
12.7.74 Understand how to calculate average speeds, given the distance travelled and the time taken. Compute the distance covered, given the uniform speed and the time of travel; compute the time taken, given the uniform speed and the distance covered.	Force and Motion Investigation 2, Parts 1-3 <u>Force and Motion Resources</u> Planetary Science Investigation 7, Part 2	Pages 78-99 Pages 17-19 Pages 222-227
12.7.75 Distinguish between mass and weight. Know that the mass of a body remains the same regardless of where it is, but that the weight of it depends on how strong the force of gravity is in its current location.	<u>Weather and Water Resources</u> Levers and Pulleys Investigation 1, Part 1	Pages 27-31 Pages 8-17 (Newtons)
12.7.76 Explain and predict motions in inertial and accelerated frames of reference.		
EARTH SCIENCE <i>(Standard E)</i>	<i>FOSS Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
The Earth's Structure 12.7.77 Understand that lithospheric plates constantly move at rates of centimeters per year in response to movements in the mantle. Understand that major geological events, such as earthquakes, volcanic eruptions, and mountain building, result from these plate motions. Understand that over very long periods of time (millions of years), old mountains wear down, but new ones arise from catastrophic volcanic and earthquake activity.	<u>Landforms FOSS Science Stories</u> <u>Earth History Resources</u> <u>Earth History CD-ROM</u>	Pages 27-34 Pages 100-105

<p>12.7.78 Understand that land forms are the result of combination of constructive and destructive forces. Understand that constructive forces include crustal deformation, volcanic eruption, and deposition of sediment, whereas destructive forces include weathering and erosion.</p>	<p>Landforms Investigation 4, Parts 1-3 <u>Landforms FOSS Science Stories</u> Earth History throughout, such as Investigation 4, Parts 1-6 Investigation 8, Parts 1-3 <u>Earth History Resources</u> <u>Earth History CD-ROM</u></p>	<p>Pages 8-24 Pages 22-24, 27-34, 43-44 Pages 127-163 Pages 254-269 Pages 100-105</p>
<p>12.7.79 Understand that soil consists of weathered rocks and decomposed organic material from dead plants, animals and bacteria. Understand that soils are often found in layers, with each having a different chemical composition and texture.</p>	<p>Earth History Investigation 4, Parts 1-2</p>	<p>Pages 127-137</p>
<p>12.7.80 Understand that glaciers can move at a rate of centimeters per year (sometimes faster), and that in the past, glacial movement has carved new geological features on various continents.</p>	<p>Landforms FOSS Science Stories</p>	<p>Pages 31-32,40</p>
<p>12.7.81 Understand that radioactive elements are useful for dating materials because the time it takes for the atoms in them to break apart is known. Know that this information can be used to determine the age of a rock within a certain number of years.</p>	<p><u>Earth History Resources</u></p>	<p>Pages 87-88</p>
<p>12.7.82 Understand that there are strata (layers) in many places in the crust of the earth. Understand that the crust of the earth is mostly igneous/metamorphic, with a relatively thin veneer of sedimentary rock layers in many, but not all places. Understand the principle of superposition: in a layered sedimentary sequence, the oldest rocks are usually at the bottom.</p>	<p>Earth History throughout, such as Investigation 3, Parts 1-4 Investigation 5, Parts 3-4 <u>Earth History Resources</u> <u>Earth History CD-ROM</u></p>	<p>Pages 88-111 Pages 183-194 Pages 6-21, 73-88</p>

<p>The Earth's Dynamic Processes 12.7.83 Compare seasonal climates in major regions of the globe, considering effects of latitude, altitude, and geography (i.e. 1. Higher altitude generally means colder temperatures, and lower air pressure; 2. Places along the equator have a 12 hour day and a 12 hour night every day of the year, and do not have strict seasons; 3. Places along latitudes between the equator and one of the earth's poles have seasons, and different amounts of daylight throughout the year: they have a longest day, a shortest day, and two equinoxes on which the daylight lasts for 12 hours; 4. Places along the Arctic and Antarctic circles have one day of exactly 24-hour daylight, and day of exactly 24-hour darkness each year).</p>	<p>Weather and Water Investigation 3, Parts 1-3 <u>Weather and Water Resources</u> <u>Weather and Water CD-ROM</u></p> <p>Planetary Science Investigation 3, Parts 1-4 <u>Planetary Science Resources</u></p>	<p>Pages 93-112 Pages 12-19</p> <p>Pages 89-109 Pages 52-53</p>
<p>12.7.84 Understand that the solid Earth is layered with a crust, under which is a hot convecting mantle, and that at the center of the earth is a dense, metallic core.</p>	<p><u>Earth History Resources</u> <u>Earth History CD-ROM</u></p> <p><u>Landforms FOSS Science Stories</u></p>	<p>Pages 100-105</p> <p>Pages 27-28</p>
<p>12.7.85 Understand that some changes in the solid earth can be described as the rock cycle: rocks at the earth's surface weather, forming new sediments that are buried, then compacted, to the surface by the forces that drive plate motion, and thus the rock cycle continues. Identify the three basic kinds of rock. Igneous rock is the result of cooled magma; granite, pumice, and scoria are examples. Sedimentary rock is the result of fine particles from eroded rocks being re-deposited by water or wind; sandstone and limestone are examples.</p>	<p>Earth History Investigation 4, Parts 1-6 Investigation 8, Parts 1-3 <u>Earth History Resources</u> <u>Earth History CD-ROM</u></p>	<p>Pages 127-163 Pages 245-269</p>

<p>Metamorphic rock is the result of rocks being changed by high temperatures and/or pressures; marble is an example.</p>		
<p>12.7.86 Understand that the theory of plate tectonics explains the formation and movement of the earth's plates. Understand that the similar contours of the continents, seafloor spreading, and the location of frequent earthquakes and volcanoes provide evidence for plate tectonics.</p>	<p><u>Earth History Resources</u> <u>Earth History CD-ROM</u> <u>Landforms FOSS Science Stories</u></p>	<p>Pages 100-105 Pages 27-28</p>
<p>12.7.87 Understand that movements of the earth's continental and oceanic plates have affected the distribution of living things on Earth. Understand that major earthquake and volcanic activity can give rise to new mountain ranges, severing different species from each other, which from then on undergo independent lines of gradual change, each adapted to its new ecosystem.</p>	<p><u>Populations and Ecosystems Resources</u></p>	<p>Pages 58-61</p>
<p>12.7.88 Understand that changes in climate (e.g. the ice ages) have affected the distribution of living things on Earth. A change in climate from warm to cold might force many animals to move closer to the equator in order to survive. Identify dynamic forces that affect land and water distributions between solid Earth, oceans, atmosphere, and organisms.</p>	<p><u>Weather and Water Resources</u></p>	<p>Pages 64-65</p>
<p>12.7.89 Understand that geologic layers and radioactive dating of rocks and meteorites provide evidence that the earth is about 4.6 billion years old, and that life has existed on Earth for over 3 billion years.</p>	<p><u>Earth History Resources</u> <u>Planetary Science Resources</u> <u>Diversity of Life Resources</u></p>	<p>Pages 73-75, 83-88 Pages 67-68 Pages 27-28, 66</p>

<p>12.7.90 Understand that life on Earth has been changed by major catastrophes (e.g., the impacts of asteroids and volcanic eruptions).</p>	<p>Planetary Science Investigation 5, Parts 1-3 <u>Planetary Science Resources</u></p>	<p>Pages 154-167 Pages 59-68</p>
<p>The Atmosphere 12.7.91 Understand that the atmosphere is a mixture of nitrogen, oxygen, argon, and trace gases that include water vapor and carbon dioxide. Understand that atmospheric conditions change as one changes altitude.</p>	<p>Weather and Water Investigation 2, Parts 1-2 <u>Weather and Water Resources</u> <u>Weather and Water CD-ROM</u> <u>Chemical Interactions Resources</u> <u>Solar Energy FOSS Science Stories</u> <u>Mixtures and Solutions FOSS Science Stories</u></p>	<p>Pages 69-82 Pages 6-11, 43-56, 63-66</p> <p>Pages 11, 52</p> <p>Pages 18-21</p> <p>Pages 18-20</p>
<p>12.7.92 Understand that clouds, formed by the condensation of water vapor, affect weather and climate. Understand that clouds cause precipitation and lightning, and that they insulate heat and moisture in the air.</p>	<p>Water Planet Investigation 4, Parts 1-2 <u>Water Planet FOSS Science Resources</u> <u>Solar Energy FOSS Science Stories</u> Weather and Water Investigation 2, Parts 1-2 Investigation 6, Part 4 Investigation 7, Parts 1-2 <u>Weather and Water Resources</u> <u>Weather and Water CD-ROM</u></p>	<p>Pages 184-203</p> <p>Pages 67-70</p> <p>Pages 18-21</p> <p>Pages 69-82 Pages 206-213 Pages 232-244 Pages 37-47 Water Cycle Game</p>
<p>12.7.93 Understand that patterns of atmospheric movement influence local weather. Understand that oceans have a major effect on climate because water in the oceans holds and distributes a large amount of heat.</p>	<p>Water Planet Investigation 4, Parts 1-2 <u>Water Planet FOSS Science Resources</u> <u>Solar Energy FOSS Science Stories</u> Weather and Water Investigation 1, Parts 1-2 Investigation 9, Parts 1-4 <u>Weather and Water Resources</u> <u>Weather and Water CD-ROM</u></p>	<p>Pages 184-203</p> <p>Pages 71-79</p> <p>Pages 18-21</p> <p>Pages 43-56 Pages 296-320 Pages 3-4, 48-56, 63-66</p>
<p>Water 12.7.94 Identify the basic stages in the hydrologic cycle on Earth, namely evaporation, condensation, and precipitation.</p>	<p>Water Planet Investigation 4, Parts 1-2 Weather and Water Investigation 7, Parts 1-2 <u>Water Planet FOSS Science Resources</u> <u>Weather and Water Resources</u> <u>Weather and Water CD-ROM</u></p>	<p>Pages 184-203</p> <p>Pages 232-244</p> <p>Pages 67-70 Pages 45-47 Water Cycle Game</p>

12.7.95 Understand that water is a solvent.	Mixtures and Solutions Investigation 1, Parts 1-4 Chemical Interactions Investigation 8, Part 1 <u>Chemical Interactions Resources</u> Weather and Water Investigation 5, Parts 1-3	Pages 8-29 Pages 248-255 Pages 49-50 Pages 152-175
12.7.96 Know that about three fourths of the earth is covered with water. Understand that most of the earth's water is salt water (oceans), and only about 3 percent of the earth's water is freshwater. Know that freshwater is found mainly in icecaps, glaciers, lakes, rivers, and the atmosphere.	Water Planet Investigation 4, Part 1 <u>Water Planet FOSS Science Resources</u> Weather and Water Investigation 7, Parts 1-2 <u>Weather and Water Resources</u> <u>Weather and Water CD-ROM</u>	Pages 184-197 Pages 63-66 Pages 232-244 Pages 45-47 Water Cycle Game
ASTRONOMY (Standard F)	<i>FOSS Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
12.7.97 Understand that objects in our solar system are for the most part in regular and predictable motion. Know that those motions explain such phenomena as the day, the year, the phases of the moon, and eclipses.	<u>Water Planet FOSS Science Resources</u> Planetary Science Investigation 3, Parts 1-4 Investigation 9, Parts 1-4 <u>Planetary Science Resources</u> <u>Planetary Science CD-ROM</u> Weather and Water Investigation 3, Parts 1-3 <u>Weather and Water Resources</u> <u>Weather and Water CD-ROM</u>	Page 3 Pages 89-109 Pages 283-301 Pages 32, 84-89, 97-100 Pages 93-112 Pages 12-19
12.7.98 Understand that gravity is the force that keeps planets in orbit around the sun and governs the rest of the motion in the solar system. Know that changes in gravitational forces explain the phenomenon of the tides.	Water Planet Investigation 1, Part 2 <u>Water Planet FOSS Science Resources</u> <u>Force and Motion Resources</u> Planetary Science Investigation 3, Parts 1-4 Investigation 9, Parts 1-4 <u>Planetary Science Resources</u> <u>Planetary Science CD-ROM</u>	Pages 59-69 Pages 16-17 Pages 62, 67-69 Pages 89-109 Pages 283-301 Pages 69-70, 97-100
12.7.99 Understand that rock samples taken by astronauts walking on the moon show that the earth and moon have a common history.	Planetary Science Investigation 8, Parts 1-4 <u>Planetary Science Resources</u> <u>Planetary Science CD-ROM</u>	Pages 250-270 Moon Rocks Pages 74-83
12.7.100 Identify the differences among the planets in our solar system: the four closest planets to the Sun are called the inner planets. The inner planets are small and have rocky surfaces. The five farthest	Water Planet Investigation 1, Part 1 <u>Water Planet FOSS Science Resources</u> Planetary Science Investigation 10, Parts 2-3 <u>Planetary Science Resources</u> <u>Planetary Science CD-ROM</u>	Pages 50-58 Pages 4-11 Pages 318-324 Pages 84-89

planets from the Sun are called the outer planets. All outer planets except Pluto are much larger than Earth, are made of gases, and have no solid surfaces.		
12.7.101 Understand that because it takes the moon the same amount of time to rotate on its axis as it does to revolve around the earth, the same side of the moon always faces the earth.	Planetary Science Investigation 4, Parts 1-3 Investigation 5, Part 5 Investigation 9, Parts 1-4 <u>Planetary Science Resources</u> <u>Planetary Science CD-ROM</u>	Pages 120-135 Pages 174-175 Pages 283-301 Pages 32, 35, 54-58
12.7.102 Understand that valleys on the surface of a planet or moon might be evidence that water is or once was there.	Earth History Resources	Pages 60-63 “Water on Mars?”
12.7.103 Understand that the speed of a planet’s rotation is one cause of the daily variations in temperature on its surface.	Planetary Science Investigation 10, Parts 2-3 <u>Planetary Science Resources</u> <u>Planetary Science CD-ROM</u>	Pages 318-324 Pages 35, 80-89
12.7.104 Understand that the cause of the earth’s seasons and the change in the amount of daylight throughout the year is the tilt of its axis of rotation with respect to the plane of its orbit. Given a diagram of the earth depicting (1) its relative position to the sun and (2) the orientation of its axis of rotation and (3) some circle of latitude, identify the following: (a) what time of year it is (if the circle of latitude is other than the equator), and (b) whether there is more daylight or more dark hours at that time of year. Understand why the seasons and daylight hours in opposite hemispheres are opposite to each other.	Weather and Water Investigation 3, Parts 1-3 <u>Weather and Water Resources</u> <u>Weather and Water CD-ROM</u>	Pages 93-112 Pages 17-19
12.7.105 Understand that the sun is an average star. Know that a solar system consists of a sun and planets and other objects that revolve around it.	Solar Energy FOSS Science Stories Models and Designs FOSS Science Stories Water Planet Investigation 1, Part 1 <u>Water Planet FOSS Science Resources</u>	Pages 1-5 Pages 5-10 Pages 50-58 Pages 2-14

	Planetary Science Investigation 2, Parts 1-2 Investigation 3, Parts 1-4 Investigation 10, Parts 2-3 <u>Planetary Science Resources</u> <u>Planetary Science CD-ROM</u>	Pages 64-70 Pages 89-109 Pages 318-324 Pages 35, 69-70, 83-89
12.7.106 Identify the relative positions of the earth, moon, and sun when the moon appears full, new, half, and when a lunar or solar eclipse occurs. From a diagram of the earth and sun in some definite position, identify what season it is at a given latitude in either hemisphere (and why). Understand how much daylight there will be at that latitude (and why). Given a diagram of the sun and the earth in some definite position with its axis of rotation drawn (and with the poles labelled), identify the earth in the positions of summer solstice, winter solstice, spring equinox, and fall equinox (for the northern hemisphere).	Planetary Science Investigation 3, Parts 1-4 Investigation 9, Parts 1-4 <u>Planetary Science Resources</u> <u>Planetary Science CD-ROM</u> Weather and Water Investigation 3, Parts 1-3 <u>Weather and Water Resources</u> Weather and Water CD-ROM	Pages 89-109 Pages 283-301 Pages 32,84-89,97-100 Pages 93-112 Pages 12-19
12.7.107 Define what a light year is, how many miles or kilometers it is, and know that galactic distances are measured in light years.	<u>Planetary Science Resources</u>	Pages 97-100

Science - Goal 13

Understand the relationships among science, technology, and society.

<i>SAFETY and PRACTICES OF SCIENCE</i> <i>(Standard A)</i>	<i>FOSS Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
13.7.01 Identify potential hazards in the laboratory and the means of reducing them.	All FOSS Modules emphasize safety. Investigations are designed using materials that are not harmful to students when used correctly. Safety rules are emphasized in the teacher guide and at specific points in the lessons where potential hazards arise. See for example: Mixtures and Solutions Overview and Investigation 4, Parts 1-3	Page 17 Pages 10-11,21

	<p>Solar Energy FOSS Science Stories</p> <p>Chemical Interactions Investigation 1, Part 1</p> <p>Earth History Overview and Investigation 5, Parts 1-3</p> <p>Electronics Resources</p>	<p>Pages 12-15</p> <p>Pages 41-45</p> <p>Page 19</p> <p>Pages 176,180-184</p> <p>Pages 12-14</p>
13.7.02 Explain how peer review helps to assure the accurate use of data and improves the scientific process.	<p>Models and Designs Investigation 1, Parts 1-2</p> <p>Models and Designs FOSS Science Stories</p> <p>Living Systems Investigation 3, Parts 2-3</p> <p>Living Systems FOSS Science Resources</p> <p>Force and Motion Investigation 5, Parts 2-4</p> <p>Force and Motion Resources</p> <p>Chemical Interactions Investigation 1, Parts 1-2</p> <p>Chemical Interactions Resources</p> <p>Planetary Science Investigation 5, Parts 1-3</p> <p>Planetary Science Resources</p> <p>Planetary Science CD-ROM</p>	<p>Pages 8-25</p> <p>Pages 1-10, 11-16</p> <p>Pages 126-144</p> <p>Pages 27-30</p> <p>Pages 177-201</p> <p>Pages 50-52</p> <p>Pages 41-54</p> <p>Pages 69-72</p> <p>Pages 154-167</p> <p>Pages 59-68</p>
13.7.03 Indicate that repeatability of results is necessary for the scientific community to accept someone's findings.	<p>This standard is addressed throughout ALL FOSS investigations as classes discuss their results, as well as in readings about scientists and their work. See for example:</p> <p>Variables Investigation 1, Parts 1-3</p> <p>Variables FOSS Science Stories</p> <p>Living Systems Investigation 3, Parts 2-3</p> <p>Populations and Ecosystems Investigation 5, Part 1</p> <p>Populations and Ecosystems Resources</p> <p>Populations and Ecosystems CD-ROM</p> <p>Force and Motion Investigation 5, Parts 2-4</p> <p>Force and Motion Resources</p> <p>Chemical Interactions Resources</p>	<p>Pages 8-27</p> <p>Pages 1-6</p> <p>Pages 126-144</p> <p>Pages 142-150</p> <p>Pages 8-13</p> <p>Walkingsticks</p> <p>Pages 177-201</p> <p>Page 50</p> <p>Pages 69-72</p>
13.7.04 Understand that one datum is not sufficient	<p>This standard is addressed throughout ALL FOSS</p>	

<p>evidence for making a generalization. For example, if a drug is given to one cancer patient, and the patient is cured, this might be mere coincidence – the drug must be given to many cancer patients with the same results before there is some kind of evidence that it is a cure for cancer. Identify the kind of reasoning called induction, and know that the more cases that are seen, the greater the certainty of the generalization drawn from those cases.</p>	<p>investigations as classes discuss their results, as well as in readings about scientists and their work. See for example: <u>Food and Nutrition FOSS Science Stories</u> <u>Models and Designs FOSS Science Stories</u> Living Systems Investigation 3, Part 2 Chemical Interactions Investigation 5, Part 1 <u>Chemical Interactions Resources</u> Human Brain and Senses Investigation 4, Parts 1-3 <u>Planetary Science Resources</u> <u>Weather and Water Resources</u> Diversity of Life Investigation 6, Parts 1-3</p>	<p>Pages 21,24-26,34-36 Pages 1-16 Pages 126-135 Pages 153-158 Pages 69-72 Pages 120-143 Pages 59-68 Pages 63-66 Pages 186-203</p>
<p>13.7.05 Understand that the scientific community establishes and observes certain conventions about nomenclature, units of measurement, and ways of presenting data.</p>	<p>This standard is addressed throughout ALL FOSS Grades 5-8 investigations as student scientists follow those same conventions. Results and lab reports are documented in lab notebooks and the SI (metric system) is used for ALL measurements. See for example: Mixtures and Solutions Investigation 2, Parts 1-4 Solar Energy Investigation 3, Parts 1-2 FOSS Web Site for ALL FOSS Grades 5-6 modules Force and Motion Investigation 5, Part 1 <u>Force and Motion Resources</u> Chemical Interactions Investigation 9, Parts 1-3 <u>Chemical Interactions Resources</u> Populations and Ecosystems Investigation 5, Parts 1-4 Weather and Water Investigation 5, Parts 1-3 <u>Weather and Water Resources</u> <u>Weather and Water CD-ROM</u></p>	<p>Pages 8-28 Pages 8-24 www.FOSSweb.com “Careers” Pages 169-176 Pages 17-19 Pages 280-307 Pages 4-6, 58, 90-91 Pages 142-169 Pages 152-175 Pages 3-5, 12-16, 27-31, 34-36, 56, 79-81, 87</p>

	<u>Planetary Science Resources</u> <u>Electronics Resources</u>	Pages 101-103 Pages 4, 5, 9-11, 26-33
13.7.06 Identify the risks associated with: natural hazards (e.g. fires, floods, tornadoes, hurricanes, earthquakes, and volcanic eruptions), chemical hazards (e.g. pollutants in air, water, soil and food), and biological hazards (e.g. pollen, viruses, bacteria, and parasites).	Water Planet Investigation 4, Part 2 <u>Solar Energy FOSS Science Stories</u> <u>Landforms FOSS Science Stories</u> <u>Mixtures and Solutions FOSS Science Stories</u> Weather and Water Investigation 1, Parts 1-2 <u>Weather and Water Resources</u> <u>Weather and Water CD-ROM</u> <u>Diversity of Life Resources</u> <u>Chemical Interactions Resources</u>	Pages 198-203 Pages 12-15,19-20 Pages 22-24,27-34 Pages 10-13,19-20 Pages 43-56 Pages 3-4,67-76 Pages 65-69 Pages 59-62
13.7.07 Understand that important social decisions are made on the basis of risk/benefit analysis (e.g. whether or not to administer a smallpox vaccine).	<u>Food and Nutrition FOSS Science Stories</u> <u>Electronics Resources</u> <u>Chemical Interactions Resources</u>	Pages 13, 24-25, 34-36 Pages 18-21, 23-25 Pages 60-61
13.7.08 Understand that science influences society insofar as its theories enter into people's everyday thinking, and affect how they understand themselves and the world they live in.	Water Planet Investigation 4, Parts 2-3 <u>Water Planet FOSS Science Resources</u> <u>Solar Energy FOSS Science Stories</u> <u>Landforms FOSS Science Stories</u> <u>Food and Nutrition FOSS Science Stories</u> Chemical Interactions Investigation 5, Part 2 <u>Chemical Interactions Resources</u> Electronics Investigation 4, Parts 1-2 <u>Electronics Resources</u> <u>Electronics CD-ROM</u> Force and Motion Investigation 2, Parts 1-3 <u>Force and Motion Resources</u> Weather and Water Investigation 1, Parts 1-2 <u>Weather and Water Resources</u> <u>Weather and Water CD-ROM</u> Populations and	Pages 198-211 Pages 80-89 Pages 16-17, 22-32 Pages 37-44 Pages 5, 10-15, 19, 21-40 Pages 159-164 Pages 80-83, 84-85 Pages 143-152 Pages 1-2, 12-14, 18-21, 23-25, 34-36 Pages 78-99 Pages 70-73 Pages 43-56 Pages 3-4, 67-76

	Ecosystems Investigation 4, Parts 1-2 <u>Diversity of Life Resources</u>	Pages 119-129 Pages 65-69
SCIENCE, TECHNOLOGY, SOCIETY (Standard B)	<i>FOSS Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
13.7.09 Identify important contributions to science and technology that have been made by individuals such as George Washington Carver, Jane Goodall, Wilbur and Orville Wright, Rachel Carson, Thomas Edison, Edward Jenner, Louis Pasteur, Anton von Leeuwenhoek, Elijah McCoy, Florence Nightingale, Daniel Hale Williams, Marie Curie, Benjamin Franklin, Alexander Graham Bell, Copernicus, Mae Jemison, John Muir, Benjamin Banneker, Elizabeth Blackwell, Charles Drew, Michael Faraday, Galileo Galilei, Percy Lavon Julian, Ernest Just and Carl Linnaeus.	<u>Models and Designs FOSS Science Stories</u> <u>Variables FOSS Science Stories</u> <u>Food and Nutrition FOSS Science Stories</u> <u>Mixtures and Solutions FOSS Science Stories</u> <u>Solar Energy FOSS Science Stories</u> Water Planet Investigation 1, Part 2 <u>Water Planet FOSS Science Resources</u> FOSS Web Site Chemical Interactions Investigation 2, Part 2 <u>Chemical Interactions Resources</u> Force and Motion Investigation 7, Parts 1-3 <u>Force and Motion Resources</u> Human Brain and Senses Investigation 1, Part 4 Populations and Ecosystems Investigation 2, Part 2 Investigation 4, Part 1 <u>Populations and Ecosystems Resources</u> <u>Planetary Science Resources</u> <u>Diversity of Life Resources</u> <u>Earth History Resources</u> <u>Weather and Water Resources</u>	Pages 4, 6-10, 15-16, 25-36 Pages 4-6, 8-9, 12-14, 18-28 Pages 9, 21, 24-26 Pages 10, 22, 26-30, 32-33 Pages 25-27 Pages 59-69 Pages 15, 18-19 www.fossweb.com “Careers” Pages 75-81 Pages 4-8, 69-72, 78-85 Pages 257-272 Pages 50-52 Pages 55-59 Pages 76-79 Pages 119-121 Pages 8-13, 28-29, 46-55 Pages 47-53, 71-73, 101-103 Pages 27-30 Pages 83-86 Pages 20-21
13.7.10 Understand that society influences science because social priorities often influence research priorities.	<u>Solar Energy FOSS Science Stories</u> <u>Food and Nutrition FOSS Science Stories</u> Water Planet Investigation 4, Parts 2-3 <u>Chemical Interactions Resources</u> Electronics Investigation 4, Parts 1-2 <u>Electronics Resources</u> <u>Electronics CD-ROM</u>	Pages 16-17, 22-32 Pages 5, 10-15, 19, 21-40 Pages 198-211 Pages 69-72 Pages 143-152 Pages 1-2, 12-14, 18-21, 23-25, 34-36

	<p>Weather and Water Investigation 1, Parts 1-2 Investigation 9, Part 4 <u>Weather and Water Resources</u> <u>Weather and Water CD-ROM</u></p> <p>Populations and Ecosystems Investigation 4, Parts 1-2 <u>Populations and Ecosystems Resources</u></p> <p>Planetary Science Investigation 7, Parts 1-5 <u>Planetary Science Resources</u></p>	<p>Pages 43-56 Pages 325-320</p> <p>Pages 3-4, 63-66, 67-76</p> <p>Pages 119-129</p> <p>Pages 8-13</p> <p>Pages 218-237 Pages 47-51, 74-79, 90-103</p>
13.7.11 Understand that natural resources are materials from the environment that are used by people. Distinguish between renewable and non-renewable resources.	<p>Solar Energy FOSS Science Stories Environments FOSS Science Stories Water Planet Investigation 4, Part 4 Weather and Water Resources Populations and Ecosystems Resources Electronics Resources Chemical Interactions Resources</p>	<p>Pages 22-32</p> <p>Pages 8, 30, 36-40</p> <p>Pages 212-216</p> <p>Pages 63-66</p> <p>Pages 8-13 Pages 18-21</p> <p>Pages 73-77</p>
13.7.12 Understand that pollution is the contamination of soil, water or the atmosphere by the discharge of harmful substances	<p>Solar Energy FOSS Science Stories Mixtures and Solutions FOSS Science Stories Environments FOSS Science Stories Chemical Interactions Resources Populations and Ecosystems Resources Electronics Resources Weather and Water Resources</p>	<p>Pages 26-32</p> <p>Pages 18-20</p> <p>Pages 35-42</p> <p>Pages 59-62</p> <p>Pages 8-13 Pages 18-21</p> <p>Pages 63-66</p>
13.7.13 Understand that fossil fuels meet most of our energy needs. Know that fossil fuels include coal, oil, and natural gas. Understand that burning fossil fuels can harm the environment, and that this constitutes one type of pollution.	<p>Solar Energy FOSS Science Stories Weather and Water Resources Populations and Ecosystems Resources</p>	<p>Pages 26-32</p> <p>Pages 63-66</p> <p>Pages 8-13</p>

<p>13.7.14 Recognize that technologies made possible by science can be harmful as well as beneficial (e.g. Einstein’s theories contributed to the development of the atomic bomb).</p>	<p><u>Food and Nutrition FOSS</u> <u>Science Stories</u> <u>Models and Designs FOSS</u> <u>Science Stories</u> <u>Chemical Interactions</u> <u>Resources</u> <u>Electronics Resources</u> <u>Weather and Water</u> <u>Resources</u></p>	<p>Page 26 Pages 25-36 Pages 7-8 Pages 18-21 Pages 63-66</p>
<p><i>MEASUREMENT</i> <i>(Standard C)</i></p>	<p><i>FOSS Investigations that prepare students for this assessment</i></p>	<p><i>Page Numbers</i></p>
<p>13.7.15 Recognize the common units of the metric system – especially units of length, volume, and mass – and interpret the symbols for these units.</p>	<p>Accurate measurement using the metric system is stressed in ALL FOSS Grades 5-8 modules. See for example: Mixtures and Solutions Investigation 2, Parts 1-4 Levers and Pulleys Investigation 3, Parts 1-3 Living Systems Investigation 2, Part 1 Water Planet Investigation 3, Part 1 Chemical Interactions Investigation 6 Chemical Interactions Resources Diversity of Life Investigation 6, Parts 1-3 Force and Motion Investigation 1, Parts 1-3 Planetary Science Investigation 8, Parts 1-4</p>	<p>Pages 8-28 Pages 8-24 Pages 85-98 Pages 125-135 Pages 178-187 Pages 58-59 Pages 186-203 Pages 47-66 Pages 250-270</p>
<p>13.7.16 Work in both Celsius and Fahrenheit, and understand the differences between these types of measurement.</p>	<p>Solar Energy ALL, such as Investigation 2, Parts 1-2 Weather and Water Investigation 1, Part 2 <u>Weather and Water</u> <u>Resources</u></p>	<p>Pages 8-24 Pages 48-56 Pages 20-26</p>
<p>13.7.17 Multiply lengths of sides to calculate the volume of a solid contained by rectangular faces. Understand that the best way to find the volume of an irregular solid is to measure how much water is displaced.</p>	<p>Environments Investigations 1-4 Math Extensions Solar Energy Investigation 4 Math Extension Variables FOSS Science <u>Stories</u></p>	<p>Student Sheets 23-26 Student Sheet 35 Pages 10-14</p>
<p>13.7.18 Select appropriate scientific instruments and technological devices to take measurements, perform calculations, organize data, or make observations.</p>	<p>This standard is stressed in ALL FOSS Grades 5-8 modules as students use tools and technology to carry out hands-on investigations. See for example: Mixtures and Solutions</p>	

	<p>Investigation 1, Parts 1-4 Food and Nutrition Investigation 2, Parts 1-3 Living Systems Investigation 2, Part 1 Water Planet Investigation 2, Parts 3-4</p> <p>FOSS Web Site for ALL Grades 5-6 modules Chemical Interactions Investigation 8, Part 1 Diversity of Life Investigation 2, Parts 1-3 Force and Motion Investigation 1, Part 2 Investigation 2, Part 3 Weather and Water Investigation 1, Part 2 CD-ROMS for ALL FOSS Middle School Modules</p>	<p>Pages 8-29 funnels/filtration Pages 8-25 gas volume tubes</p> <p>Pages 85-98</p> <p>Pages 93-112</p> <p>www.FOSSweb.com</p> <p>Pages 248-255</p> <p>Pages 72-92 microscopes</p> <p>Pages 57-62 Pages 89-99</p> <p>Pages 48-56 weather tools</p> <p>Data analysis and extensions</p>
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