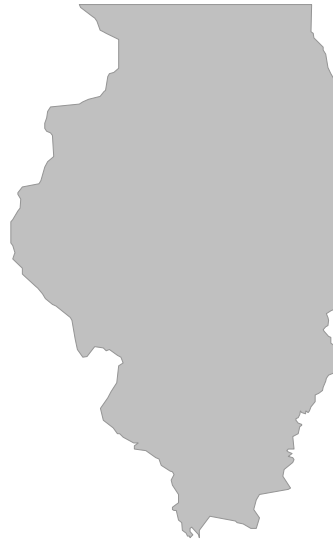


**Delta Science Module Program
(DSM™)
Grades K-8**

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 DSM (Delta Science Modules)**

This correlation is to show representative examples of investigations and activities from the DSM program, which address the assessment. A citation does not reflect all of the investigations or activities from DSM that might address a particular benchmark.

Grade 4

Science - Goal 11: Understand the processes of scientific inquiry and technological design to investigation questions, conduct experiments, and solve problems.

SCIENTIFIC INQUIRY (Standard A)	<i>DSM Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
11.4.01 Design and perform simple experiments.	This is addressed in all DSM modules. See for example: From Seed to Plant Activity 8 Soil Science Activity 10 Small Things and Microscopes Activity 12 and 13 Magnets Activity 3 and 4	Pages 67-72 Pages 91-97 Pages 73-84 Pages 25-34
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 is addressed in all DSM modules at a developmentally appropriate level. See for example: Investigating Water Activity 7 Amazing Air Activity 5 Classroom Plants Activity 5 Electric Circuits Activity 6 and 7 Animal Behavior Activity 5-7	Pages 55-61 Pages 43-49 Pages 47-53 Pages 51-62 Pages 31-52
11.4.03 Compare observations of individual and group results.	This is addressed in discussions in all DSM investigations. See for example: Observing an Aquarium Activity 8 and 11 Investigation Water Activity 12 Classroom Plants Activity 3-5 Soil Science Activity 11 and 12 Weather Instruments Activity 6	Pages 79-87, 109-116 Pages 95-100 Pages 29-53 Pages 99-114 Pages 51-57
11.4.04 Distinguish among the following: recording the data from an experiment,	Finding the Moon Activity 3 and 4 From Seed to Plant	Pages 29-46

organizing data into a more useful form, analyzing it to identify relevant patterns, and reporting and displaying results.	Activity 8 Amazing Air Activity 5 Plant and Animal Populations Activity 6-9 Animal Behavior Activity 5 and 6 Powders and Crystals Activity 5 and 6	Pages 67-72 Pages 43-49 Pages 59-93 Pages 31-44 Pages 35-48
TECHNOLOGICAL DESIGN (Standard B)	<i>DSM 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.	States of Matter Activity 5, Science Challenge Force and Motion Activity 12, Science Challenge Sound Activity 12 Investigating Water Activity 5 Amazing Air Activity 12	Page 50 Page 117 Pages 99-105 Page 45 Page 67
11.4.06 Assess given test results on a prototype (i.e. draw conclusions about the effectiveness of the design using given criteria).	States of Matter Activity 5, Science Challenge Force and Motion Activity 12, Science Challenge Sound Activity 12 Investigating Water Activity 5 Amazing Air Activity 12	Page 50 Page 117 Pages 99-105 Page 45 Page 67

Science - Goal 12: Understand the fundamental concepts, principles, and interconnections of life, physical and earth/space sciences.

LIVING THINGS (Standard A)	<i>DSM Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
Classification 12.4.01 Distinguish between living and nonliving things.	From Seed to Plant Activity 1 and 2 Observing an Aquarium Activity 2 Plant and Animal Life Cycles Activity 1 Classroom Plants Reader Butterflies and Moths Reader Plant and Animal Populations Reader	Pages 15-31 Pages 23-30 Pages 15-21 Pages 2-4 Page 2 Pages 8-9
12.4.02 Understand the concept of a food chain and the related classifications of plants or animals (e.g.	Observing an Aquarium Activity 7 Reader Plants and Animal	Pages 69-78 Page 12

<p>producers, decomposers, consumers, herbivores, and carnivores).</p>	<p>Populations Activity 10-12 Reader Insect Life Activity 10 Food Chains and Webs Activity 8-12 Reader</p>	<p>Pages 95-117 Pages 10-13 Pages 61-71 Pages 67-101 Pages 6-9</p>
<p>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).</p>	<p>Observing an Aquarium Activity 4 and 5 Reader Plant and Animal Populations Activity 4-6 Butterflies and Moths Activity 12 Reader Insect Life Activity 1 and 5 Plant and Animal Life Cycles Reader</p>	<p>Pages 39-55 Page 4, 8 Pages 43-67 Pages 105-110 Pages 4-7 Pages 7-13, 35-39 Pages 7-12</p>
<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>Observing an Aquarium Activity 10 Reader From Seed to Plant Reader Butterflies and Moths Activity 1, 6, 9 and 11 Reader Classroom Plants Reader Insect Life Activity 2 and 7 Plant and Animal Life Cycles Activity 4, 5 and 10 Reader</p>	<p>Pages 97-107 Pages 10-11 Pages 10-11 Pages 15-21, 53-59, 79-87, 97-104 Pages 3, 6-13 Page 5 Pages 15-22, 47-54 Pages 43-56, 91-96 Pages 3-13</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>Observing an Aquarium Activity 4, 5 and 10 Reader From Seed to Plant Activity 2-5 Reader Plant and Animal Populations Activity 5-7 Reader Butterflies and Moths Activity 9 and 12 Reader Plant and Animal Life Cycles Activity 9-11 Reader</p>	<p>Pages 39-55, 97-107 Pages 8, 10-11 Pages 21-52 Page 2 Pages 51-76 Pages 6-7 Pages 79-87, 105-110 Pages 4,7,13 Pages 83-103 Pages 2, 7-11</p>

ENVIRONMENT AND INTERACTION OF LIVING THINGS (Standard B)	<i>DSM Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
12.4.06 Identify the basic needs of living things: animals need air, water, food and shelter; plants need air, water, nutrients, and light.	From Seed to Plant Activity 8 and 11 Reader Observing an Aquarium Activity 2 Reader Classroom Plants Activity 5 Food Chains and Webs Activity 3 Reader Animal Behavior Activity 1	Pages 67-72, 85-90 Pages 4-8, 12 Pages 23-30 Pages 8-9, 12 Pages 47-53 Pages 31-37 Page 6 Pages 7-12
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.	Observing an Aquarium Activity 1, 2, 12 Reader Butterflies and Moths Activity 4 Plant and Animal Populations Activity 4-7, 10 and 11 Reader Food Chains and Webs Activity 5 and 6 Reader Small Things and Microscopes Activity 11	Pages 15-30, 117-125 Reader 4-9, 14-15 Pages 39-45 Pages 43-79, 95-110 Pages 2-3 Pages 47-58 Pages 2-3, 10 Pages 67-71
12.4.08 Understand that each plant or animal has different structures that serve different functions in its growth, survival, and reproduction.	Observing an Aquarium Activity 3-5 From Seed to Plant Activity 9 and 10 Using Your Senses Activity 1,5,10, 11 Plant and Animal Populations Activity 4-7 Reader Classroom Plants Activity 6-9 Reader Butterflies and Moths Reader Dinosaurs and Fossils Activity 8 Reader Food Chains and Webs Activity 4-6 Reader Insect Life Activity 5, 9, 12 Plants and Animal Life Cycles Reader	Pages 31-55 Pages 73-84 Pages 13-21, 45-52, 81-85, 89-95 Pages 43-76 Pages 5-7 Pages 55-86 Pages 6-12 Pages 4-7 Pages 61-66 Pages 8-11 Pages 39-58 Pages 4-5 Pages 35-39, 67-71, 79-83 Pages 3-6, 15
12.4.09 Identify the basic	Observing an Aquarium	

<p>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).].</p>	<p>Activity 4 and 5 Plant and Animal Populations Activity 10-12 Reader Butterflies and Moths Activity 12 Dinosaurs and Fossils Activity 10 Reader Insect Life Activity 5 and 10 Food Chains and Webs Activity 9-12 Reader</p>	<p>Pages 39-55 Pages 95-117 Page 12 Pages 105-110 Pages 75-82 Page 6 Pages 35-39, 67-71 Pages 73-101 Pages 4-5</p>
<p>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.</p>	<p>Observing an Aquarium Activity 2, 12 Plant and Animal Populations Reader Food Chains and Webs Activity 1-9 Reader</p>	<p>Pages 23-30, 117-125 Pages 2-3, 8-13 Pages 15-79 Pages 2-3, 6-9</p>
<p>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).</p>	<p>Butterflies and Moths Activity 11, Science and Social Studies Reader Plant and Animal Populations Reader</p>	<p>Page 104 Page 15 Page 7</p>
<p>12.4.12 Understand that human activities can change the number of species in an area, whether by increasing it or decreasing it.</p>	<p>Plant and Animal Populations Activity 7, Science, Technology and Society Activity 10, Science, Technology, and Society Reader Food Chains and Webs Activity 10, Science, Technology and Society Activity 12, Science, Technology, and Society</p>	<p>Page 76, Page 101 Page 15 Page 87 Page 101</p>

MATTER AND ENERGY (Standard C)	<i>DSM 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>Amazing Air Activity 4 Investigating Water Reader States of Matter Activity 6</p>	<p>Pages 35-42 Pages 6-11 Pages 51-56</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>Investigating Water Activity 7 Reader States of Matter Reader Powders and Crystals Activity 5</p>	<p>Pages 55-61 Page 13 Page 13 Pages 35-42</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>Investigating Water Activity 9-11 Reader Properties Activity 7-9 Reader States of Matter Activity 1-12 Reader Sink or Float Reader Water Cycle Activity 8-13 Reader</p>	<p>Pages 71-94 Pages 4-11 Pages 53-73 Pages 5-13, 15 Pages 13-101 Pages 4-10 Pages 5, 15 Pages 69-114 Pages 8-9</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>Properties Activity 11 Reader Magnets Activity 1 and 2 Reader Electric Circuits Reader</p>	<p>Pages 81-86 Page 8 Pages 13-23 Pages 2-3, 10 Page 2</p>
<p>12.4.17 Understand that rubbing together certain objects produces a static electrical charge; in particular, rubbing a balloon on someone's hair or walking in a dry room can build up a charge on the person walking</p>	<p>Electric Circuits Activity 1, Science and Language Arts Activity 2, Science Extension Reader</p>	<p>Page 17 Page 25 Page 2</p>

(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.	Electric Circuits Activity 2, Science Challenge Activity 2, Science Extension Reader	Page 25 Page 25 Page 2
12.4.19 Understand that electrical energy can be converted to heat, light, and motion.	Electric Circuits Activity 1-4, 8-10 Reader	Pages 13-43, 63-82 Pages 3-6
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.	Electric Circuits Activity 1-4 Reader Magnets Reader	Pages 13-43 Pages 4-7 Page 10
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.		
12.4.22 Understand that white light can be broken into all the colors of the rainbow by means of prisms.		
12.4.23 Understand that light can be reflected, refracted, transmitted, and absorbed by matter.		
12.4.24 Identify the colors associated with the acronym ROYGBIV.		
FORCE AND MOTION (Standard D)	<i>DSM 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.	Force and Motion Activity 1 and 2 Reader Magnets Reader	Pages 13-29 Pages 2-3 Pages 2-3
12.4.26 Identify the basic forces, such as friction,	Properties Activity 11	Pages 81-86

magnetism, and gravity. Identify which force is operative in a simple scenario.	Reader Force and Motion Activity 4 and 5 Reader Magnets Activity 1-4 Reader Electric Circuits Reader	Page 8 Pages 41-55 Pages 2, 15 Pages 13-34 Pages 2-3 Pages 8-10
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.	Force and Motion Activity 3-12 Reader	Pages 31-117 Pages 5-13
12.4.28 Identify equilibrium conditions (e.g. in a diagram of balanced weights on levers or pulleys).	Force and Motion Activity 3 and 8 Reader Amazing Air Activity 6 Measuring Activity 9 and 10	Pages 31-39, 73-82 Pages 6, 8 Pages 51-57 Pages 65-78
EARTH SCIENCE (Standard E)	<i>DSM 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 animals and plants, and that oil and coal are examples of fossil fuels.		
The Earth's Dynamic Processes 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).	Soil Science Activity 12 Earth Movements Activity 5-12 Reader	Pages 107-114 Pages 47-110 Pages 4-13
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.		
12.4.33 Identify the three basic kinds of rocks: igneous, sedimentary, and metamorphic.	Earth Movements Activity 3, Activity 3, Science Challenge Reader	Pages 29-37 Page 37 Page 15
12.4.34 Understand that movement in parts of the earth's crust causes earthquakes.	Earth Movements Activity 11 Reader	Pages 97-103 Pages 9-10
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).	Soil Science Activity 12 Earth Movements Reader	Pages 107-114 Pages 12-13
12.4.36 Understand that land formations (mountains, valleys, shorelines, and 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).	Soil Science Activity 12 Earth Movements Activity 5-12 Reader	Pages 107-114 Pages 47-110 Pages 4-13
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.	Weather Watching Activity 6 Weather Instruments Activity 10 Reader	Pages 51-59 Pages 81-87 Page 13
12.4.38 Identify the stages of the water cycle: evaporation, condensation, and	Investigation Water Reader Weather Watching	Pages 10-11

precipitation.	Reader Weather Instruments Activity 9 Reader Water Cycle Activity 4-13 Reader	Pages 4-5 Pages 75-80 Page 6 Pages 39-114 Pages 8-11
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.	Sunshine and Shadows Reader Weather Watching Activity 1-12 Reader Weather Instruments Activity 1-12 Activity 6, Science Challenge Reader	Pages 12-13 Pages 13-116 Pages 2-3, 10-12 Pages 13-109 Page 57 Page 2
12.4.40 Understand that weather can be described by measurable quantities, such as temperature, wind direction and speed, and amount of precipitation.	Weather Watching Activity 1-7 Reader Weather Instruments Activity 1-11 Reader	Pages 13-68 Pages 6-7 Pages 13-96 Pages 3-9
12.4.41 Understand that weather systems can be tracked – and their motions roughly predicted – by satellites.	Weather Watching Reader Weather Instruments Reader	Pages 14-15 Page 12
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.	Observing an Aquarium Activity 1 Earth Movements Reader Water Cycle Activity 1 Reader	Pages 15-21 Pages 4-5 Pages 13-21 Pages 2-7
ASTRONOMY (Standard F)	<i>DSM Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
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.	Finding the Moon Reader Solar System Activity 1 Reader	Page 4 Pages 13-20 Page 7
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.	Solar System Reader	Page 7
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	Solar System Activity 1 and 8 Reader	Pages 13-20, 65-72 Pages 2-12

occasionally switch order.		
12.4.46 Know that astronauts have walked on the moon.	Finding the Moon Reader	Page 14
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.	Solar System Activity 12	Pages 101-110
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.		
12.4.49 Understand that the mass of a body stays the same on different planets, but the weight changes depending on the mass of the planet.		

Science - Goal 13: Understand the relationships among science, technology, and society.

SAFETY and PRACTICES OF SCIENCE (Standard A)	<i>DSM 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).	DSM Modules emphasize safety. See for example: Powders and Crystals Activity 2-10 Looking at Liquids Activity 9 and 12	Pages 13-78 Pages 63-69, 83-90
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 DSM Modules. See for example: Sunshine and Shadows Force and Motion Electric Circuits Powders and Crystals	Pages 12, 15, 21, 116 Pages 15, 17, 25, 140 Pages 12, 15, 30, 64 Pages 46, 51, 66
13.4.03 Explain why similar results are expected when procedures are done the same way.	This standard is addressed throughout DSM investigations as classes discuss their results. See for example: Investigating Water Activity 7 and 8 Sink or Float Activity 1-3 States of Matter Activity 7, 11 Magnets Activity 3 and 4 Small things and Microscopes	Pages 55-69 Pages 13-34 Pages 57-63, 89-96 Pages 25-34

	Activity 12	Pages 73-77
13.4.04 Know what distinguishes science from mere guesswork is its 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.	DSM modules provide the opportunity for the teaching of these concepts. See for example: Soil Science Activity 10 and 11 Animal Behavior Activity 5-7 Sound Activity 10 and 11	Pages 91-105 Pages 31-52 Pages 83-98
13.4.05 Know that scientists accept a theory that is supported by tests and experiments until it is disproved or improved upon.	DSM modules provide the opportunity for the teaching of these concepts. See for example: Earth Movements Activity 5 and 6	Pages 47-61
13.4.06 Distinguish between the kinds of questions that can be investigated by the scientific method and those that cannot.	DSM modules provide the opportunity for the teaching of these concepts. See for example: Observing an Aquarium Activity 3-6 Amazing Air Activity 6 Food Chains and Webs Activity 4-6 Animal Behavior Activity 5-7	Pages 31-67 Pages 51-57 Pages 39-58 Pages 31-52
13.4.07 Recognize that scientists share results to that each scientist may build upon what he or she learns from others.	DSM investigations encourage discussion and comparing of results so that students can learn from each other. See for example: Investigating Water Activity 12 Using Your Senses Activity 2 Sink or Float Activity 8 and 9 Powders and Crystals Activity 5-9 Electrical Circuits Activity 6 and 7	Pages 95-100 Pages 23-30 Pages 67-80 Pages 35-69 Pages 51-62
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.	DSM modules provide the opportunity for the teaching of these concepts. See for example: Sunshine and Shadows Activity 8 and 9 Force and Motion Activity 4 and 5 Animal Behavior Activity 5-7 Electrical Circuits Activity 6 and 7	Pages 65-76 Pages 41-55 Pages 31-52 Pages 51-62

SCIENCE, TECHNOLOGY, SOCIETY (Standard B)	<i>DSM Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
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.	Weather Watching Reader Classroom Plants Reader Food Chains and Webs Reader Electrical Circuits Activity 9, Science and Social Studies Reader Solar System Activity 2, Science and Social Studies	Page 23 Page 14 Pages 11-12 Page 76 Pages 12-13 Page 26
13.4.10 Recognize that science and technology advance together.	DSM modules provide the opportunity for the teaching of these concepts. See for example: Small Things and Microscopes Activity 3 Magnets Activity 11, Science, Technology, and Society Reader Solar System Activity 11, Science, Technology, and Society Sound Reader	Pages 19-24 Page 76 Pages 14-15 Page 100 Pages 8,14
13.4.11 Identify occupations in the field of science.	Observing an Aquarium Activity 2, Science, Technology, and Society Finding the Moon Reader Classroom Plants Activity 12 Weather Watching Reader Electrical Circuits Activity 2, Science and Careers	Page 30 Page 14 Pages 105-112 Page 14 Page 25
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).	Sunshine and Shadows Activity 11, Science, Technology, and Society Force and Motion Activity 11, Science, Technology, and Society Reader Electrical Circuits Reader Water Cycle Reader Sound Reader	Page, 88 Page 109 Pages 12-14 Pages 14-15 Pages 14-15 Pages 12-14

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).		
13.4.14 Identify ways to reduce, reuse, and recycle materials.	Investigating Water Activity 12, Science, Technology, and Society Soil Science Activity 12, Science, Technology, and Society Reader Water Cycle Activity 11, Science and Math Reader	Page 100 Page 114 Pages 10-12 Page 98 Pages 14-15
MEASUREMENT (Standard C)	<i>DSM Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
13.4.15 Know that using measuring tools results in greater accuracy than making estimates.	DSM modules provide the opportunity for the teaching of these concepts. See for example: Properties Activity 6 Length and Capacity Activity 5, 6, 10-12 Measuring Activity 5-12 Force and Motion Activity 1 and 2 Weather Instruments Activity 1-3	Pages 47-52 Pages 37-48, 72-94 Pages 37-95 Pages 13-29 Pages 13-26
13.4.16 Identify basic scientific instruments and their functions (e.g. ruler, balance, graduated cylinder, clock or stopwatch, thermometer, microscope, and telescope).	Length and Capacity Activity 5, 6, 10-11 Measuring Activity 5-12 Weather Instruments Activity 1-3 Small Things and Microscopes Activity 3 Amazing Air Activity 4 States of Matter Activity 6 and 7	Pages 37-48, 77-88 Pages 37-95 Pages 13-36 Pages 19-24 Pages 35-42 Pages 57-63
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:	Length and Capacity Activity 5, 6, 10-11 Measuring Activity 5-12 Weather Instruments Activity 1-3 Amazing Air Activity 4 States of Matter Activity 6 and 7	Pages 37-48, 77-88 Pages 37-95 Pages 13-36 Pages 35-42 Pages 57-63

m, cm, mm, l, mL, mg, kg, and degrees Celcius.		
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Grade 7

Science - Goal 11: Understand the processes of scientific inquiry and technological design to investigation questions, conduct experiments, and solve problems.

SCIENTIFIC INQUIRY (Standard A)	<i>DSM 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.	This standard is addressed in all DSM modules. See for example: Solar Energy Activity 2-8 Pond Life Activity 12 Chemical Interactions Activity 12 and 13 Famous Scientists Activity 7	Pages 13-58 Pages 81-86 Pages 87-97 Pages 65-75
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.	This standard is addressed in all DSM modules at a developmentally appropriate level. See for example: Electromagnetism Activity 6 You and Your Body Activity 3 Pond Life Activity 12 Famous Scientists Activity 7	Pages 43-48 Pages 27-31 Pages 81-86 Pages 65-75
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.	Earth Processes Activity 1, 7-14 Famous Scientists Activity 11 and 12	Pages 7-14, 105-112 Pages 105-113
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	Pond Life Activity 12 Solar Energy Activity 3-8 Chemical Interactions Activity 12 Plants in Our World Activity 3	Pages 81-86 Pages 21-58 Pages 87-92 Pages 19-24

experiment. Identify constants and variables in described experiments.		
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.	Famous Scientists Activity 7 Plants in Our World Activity 3	Pages 65-75 Pages 19-24
11.7.06 Distinguish between the kinds of questions that can be investigated by the scientific method and those that cannot.	DSM modules include a variety of investigations. For example: Pollution Activity 1-12 Oceans Activity 9-12 Electrical Connections Activity 9-11 Newton's Toy Box Activity 7-9	Pages 13-88 Pages 99-142 Pages 59-76 Pages 39-54
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.	Electromagnetism Activity 6 Pond Life Activity 12 Fungi-Small Wonders Activity 7 Chemical Interactions Activity 12 Plants in Our World Activity 3	Pages 43-48 Pages 81-86 Pages 45-49 Pages 87-92 Pages 19-24
TECHNOLOGICAL DESIGN (Standard B)	<i>DSM Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
11.7.08 Identify a design problem and establish criteria for determining the success of a solution.	Simple Machines Activity 12, Science Challenge Solar Energy Activity 11 and 12 Flight and Rocketry Activity 5, Reinforcement If Shipwrecks Could Talk Activity 4, Science Extension Newton's Toy Box	Page 95 Pages 71-82 Page 63 Page 45

	Activity 10, Science Challenge	Page 58
11.7.09 Compare design solutions; select which one is best given certain restrictions on available materials, tools, cost effectiveness, and safety.	Simple Machines Activity 12, Science Challenge Solar Energy Activity 11 and 12 Flight and Rocketry Activity 5, Reinforcement If Shipwrecks Could Talk Activity 4, Science Extension Newton's Toy Box Activity 10, Science Challenge	Page 95 Pages 71-82 Page 63 Page 45 Page 58
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?")	Simple Machines Activity 12, Science Challenge Solar Energy Activity 11 and 12 Flight and Rocketry Activity 5, Reinforcement If Shipwrecks Could Talk Activity 4, Science Extension Newton's Toy Box Activity 10, Science Challenge	Page 95 Pages 71-82 Page 63 Page 45 Page 58
11.7.11 Identify improvements to a prototype indicated by given test results.	Simple Machines Activity 12, Science Challenge Solar Energy Activity 11 and 12 Flight and Rocketry Activity 5, Reinforcement If Shipwrecks Could Talk Activity 4, Science Extension Newton's Toy Box Activity 10, Science Challenge	Page 95 Pages 71-82 Page 63 Page 45 Page 58

Science - Goal 12: Understand the fundamental concepts, principles, and interconnections of life, physical and earth/space sciences.

LIVING THINGS (STANDARD A)	<i>DSM 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 DSM modules in the Life Science strand. For example: Pond Life Activity 1, 3, 5-11 Fungi-Small Wonders Activity 2, 4	Pages 7-11, 19-25, 35-74 Pages 13-18, 25-29
12.7.02 Understand that animals have parts well suited to the places they live in and to their needs. For example, rabbits radiate heat through their ears, and those living in hotter climates have larger ears to radiate heat	Pond Life Activity 8 and 9 Oceans Activity 10 Reader	Pages 57-67 Pages 113-124 Pages 12-13

<p>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>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>DNA-From Genes to Proteins Activity 3 and 4 Plants in Our World Activity 1, 2, 4</p>	<p>Pages 19-29 Pages 7-18, 25-30</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>DNA-From Genes to Proteins Activity 3 and 4 Plants in Our World Activity 1</p>	<p>Pages 19-29 Pages 7-12</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.	Fungi-Small Wonders Activity 4 Pond Life Activity 5-10	Pages 25-29 Pages 35-74
12.7.06 Understand that the nucleus of cell contains the genetic information for the plant or animal to which it belongs.	DNA-From Genes to Proteins Activity 5-7	Pages 31-51
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.	DNA-From Genes to Proteins Activity 5, Science Extension	Page 35
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.		
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).	Pond Life Activity 10 Fungi-Small Wonders Activity 4	Pages 69-74 Pages 25-29
12.7.10 Understand that the offspring of sexual reproduction inherits half its genes from each parent.	DNA-From Genes to Proteins Activity 3, Science Extension	Page 23
12.7.11 Understand that an inherited trait can be determined by one or more genes	DNA-From Genes to Proteins Activity 3, Science Extension Activity 5, Science Challenge	Page 23 Page 35
12.7.12 Understand that DNA (deoxyribonucleic 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.	DNA-From Genes to Proteins Activity 5-9	Pages 31-68
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	DNA-From Genes to Proteins Activity 3, Science Extension	Page 23

<p>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).</p>		
<p>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.</p>		
<p>12.7.15 Understand the basics of plant reproduction and define and state the purposes of pollen, ovules, seeds, and fruit.</p>		
<p>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.</p>	<p>Fungi-Small Wonders Activity 1 Plants in Our World Activity 1</p>	<p>Pages 7-11 Pages 7-12</p>
<p>12.7.17 Understand that energy for life primarily derives from the sun; understand the process of photosynthesis.</p>	<p>Plants in Our World Activity 9</p>	<p>Pages 63-68</p>
<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>Plants in Our World Activity 4, Science and Language Arts</p>	<p>Page 30</p>
<p>12.7.19 Classify roots as either fibrous roots or tap roots.</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>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</p>		

<p>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>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>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>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>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>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>12.7.27 Identify the temporal order in which majors groups of organisms are thought to have appeared on earth: 1.</p>		

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.		
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).		
ENVIRONMENT AND INTERACTION OF LIVING THINGS (Standard B)	<i>DSM Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
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.	Oceans Activity 5 Plants in Our World Activity 9 and 10	Pages 55-63 Pages 57-68
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.	Pond Life Activity 11, Science, Technology, and Society Activity 12, Science, Technology, and Society	Page 80 Page 86

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.		
12.7.32 Distinguish the various members of a food web and identify the order of dependence among these members.	Pond Life Activity 11 Activity 11, Science Extension	Pages 75-80 Page 80
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.	Pond Life Activity 11	Pages 75-80
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).		
12.7.35 Identify and describe the basic kinds of habitats: freshwater vs. saltwater, river, pond, desert, forest, and prairie.	Pond Life Activity 1, 3, 4 Oceans Activity 1 Reader	Pages 7-11, 19-34 Pages 13-21 Pages 12-13
12.7.36 Identify and describe the major biomes and their characteristics: desert, grassland, savannah, tropical forest, coniferous forest, and tundra.		
MATTER AND ENERGY (Standard C)	<i>DSM 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. 1. Physically, a change in the size shape or state of matter (e.g., the melting of an ice cube, tearing of paper). 2. Chemically, where matter can change into another kind of matter (e.g., burning of wood, rusting of iron).</p>	<p>Oceans Activity 2 Earth Processes Activity 3 Chemical Interactions Activity 2, 12, 13</p>	<p>Pages 23-30 Pages 21-29 Pages 15-21, 87-97</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>Rocks and Minerals Activity 4 Chemical Interactions Activity 1 and 2 Famous Scientists Activity 1</p>	<p>Pages 35-40 Pages 7-21 Pages 11-19</p>
<p>12.7.39 Understand that the phases of matter depend on how the atoms and molecules of a substance move.</p>		
<p>12.7.40 Identify the most familiar elements which are gases at room temperature.</p>		
<p>12.7.41 Know the definitions of melting point and boiling point and understand the concepts of evaporation and sublimation.</p>	<p>Oceans Activity 2, 5 Weather Forecasting Activity 9</p>	<p>Pages 23-30, 55-63 Pages 69-74</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>Chemical Interactions Activity 4</p>	<p>Pages 29-35</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>Chemical Interactions Activity 4</p>	<p>Pages 29-35</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:</p>		

magnesium, aluminium, titanium, iron, nickel, copper, zinc, silver, platinum, gold and mercury.		
12.7.46 Identify simple compounds (e.g. H ₂ O).	Chemical Interactions Activity 5-7	Pages 37-57
The Atom 12.7.47 Define atom as the smallest part of an element that still has the properties of that element.	Chemical Interactions Activity 4	Pages 29-35
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.	Chemical Interactions Activity 4	Pages 29-35.
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.	Chemical Interactions Activity 5 and 6	Pages 37-51
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.	Chemical Interactions Activity 5-7	Pages 37-57
12.7.51 Understand that during a chemical change atoms are neither created nor destroyed, but are rearranged to make new substances.	Chemical Interactions Activity 7	Pages 53-57

<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>Pollution Activity 8 Chemical Interactions Activity 10</p>	<p>Pages 59-64 Pages 73-79</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>Chemical Interactions Activity 7</p>	<p>Pages 53-57</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>Solar Energy Activity 1 and 2 Flight and Rocketry Activity 9, 12 Color and Light Activity 1 Reader Electromagnetism Activity 6 Reader Electrical Connections Activity 1 and 2</p>	<p>Pages 7-19 Pages 91-97, 121-130 Pages 13-18 Pages 1-2 Pages 43-48 Pages 2-3 Pages 7-18</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 Activity 2-4 Famous Scientists Activity 7</p>	<p>Pages 13-32 Pages 65-75</p>
<p>12.7.56 Understand that energy can be transferred by radiation, conduction, and convection.</p>	<p>Solar Energy Activity 2-10 Electrical Connections Activity 7</p>	<p>Pages 13-70 Pages 45-51</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>Electromagnetism Reader Electrical Connections Activity 2, 3, 7</p>	<p>Pages 4-5 Pages 13-24, 45-51</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>Lenses and Mirrors Activity 1 Activity 1, Science Extension Color and Light Reader</p>	<p>Pages 7-12 Page 12 Pages 5-6</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 Activity 1 and 2 Color and Light Activity 1 Reader</p>	<p>Pages 7-19 Pages 13-18 Page 2</p>
<p>12.7.60 Understand that visible light is a small band within a very broad electromagnetic spectrum.</p>	<p>Color and Light Activity 1 Activity 1, Science, Technology, and Society Reader</p>	<p>Pages 13-18 Page 18 Pages 8-9</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>Lenses and Mirrors Activity 1, 2, 4 Color and Light Reader</p>	<p>Pages 7-19, 27-34 Page 4</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>Lenses and Mirrors Activity 8 Color and Light Reader</p>	<p>Pages 55-65 Page 5</p>
<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.</p>	<p>Lenses and Mirrors Activity 1 and 2 Color and Light Reader</p>	<p>Pages 7-19 Page 4</p>
<p>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</p>	<p>Lenses and Mirrors Activity 8 and 9 Color and Light Reader Astronomy Activity 9</p>	<p>Pages 55-74 Page 6 Pages 77-83</p>

glasses work in the same way.		
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.	Color and Light Activity 1, Science Challenge Reader	Page 18 Pages 2-3
12.7.66 Identify the basic properties of waves: frequency, wavelength, and velocity.	Oceans Activity 6 Reader Color and Light Activity 1, Science Challenge	Pages 65-73 Page 7 Page 18
12.7.67 Understand that in the spectrum of visible light, lower frequency colors are toward red, and higher frequency colors are toward blue.	Color and Light Activity 1, Science, Technology, and Society Reader	Page 18 Pages 8-9
FORCE AND MOTION (Standard D)	<i>DSM 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 quantified or measured in various ways, but in particular spring scales can be used.	Simple Machines Activity 1, 3, 8 Reader Flight and Rocketry Activity 2, 8, 9, 12 Reader Newton's Toy Box Activity 1-13 Famous Scientists Activity 2 and 3	Pages 13-18, 25-31, 65-69 Page 2 Pages 23-32, 81-97, 121-130 Pages 7, 10-11, 12 Pages 7-70 Pages 21-34
12.7.69 Understand the concept of constant, variable, and periodic motions.	Newton's Toy Box Activity 7-13	Pages 39-70
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	Flight and Rocketry Activity 10, 12 Newton's Toy Box Activity 7-13	Pages 91-97, 121-130 Pages 7-70

equal and opposite reaction.		
12.7.71 Understand the concept of work and recognize applications of simple machines (wedge, pulley, lever, screw, and inclined plane) in common tools.	Simple Machines Activity 1-12 Reader Famous Scientists Activity 2	Pages 13-95 Pages 3-11 Pages 21-28
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.	Oceans Activity 3 Famous Scientists Activity 1 Chemical Interactions Activity 1 If Shipwrecks Could Talk Activity 4	Pages 31-41 Pages 11-19 Pages 7-13 Pages 35-45
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.	Newton's Toy Box Activity 2 and 3 Famous Scientists Activity 3	Pages 13-24 Pages 29-34
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.	Newton's Toy Box Activity 7-9	Pages 39-54
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.	Newton's Toy Box Activity 3	Pages 19-24
12.7.76 Explain and predict motions in inertial and accelerated frames of reference.	Newton's Toy Box Activity 7-9	Pages 39-54

EARTH SCIENCE (Standard E)	<i>DSM Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
<p>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.</p>	<p>Erosion Reader Earth Processes Activity 1, 3, 7-14</p>	<p>Pages 2-13 Pages 7-14, 21-29, 55-112</p>
<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>Erosion Activity 1, 2, 9-12 Reader Oceans Activity 4 Earth Processes Activity 3, 5, 7, 13</p>	<p>Pages 9-12, 75-104 Pages 4-13 Pages 43-54 Pages 21-29, 39-46, 55-60, 95-103</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>Erosion Activity 8 Reader Earth Processes Activity 3</p>	<p>Pages 67-73 Pages 6-7 Pages 21-29</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>Erosion Activity 12 Activity 12, Science Extension Reader</p>	<p>Pages 99-104 Page 104 Page 13</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</p>		

of years.		
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.	Rocks and Minerals Activity 10, Science Challenge Activity 10, Science Extension Reader Earth Processes Activity 4 Activity 4, Science Challenge	Page 84 Page 84 Pages 10-12 Pages 31-38 Page 38
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).	Solar Energy Activity 6, Science Extension Famous Scientists Activity 7, Science Challenge	Page 46 Page 75
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.	Rocks and Minerals Reader Erosion Reader Earth Processes Activity 2	Page 1 Page 2 Pages 15-20
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.	Rocks and Minerals Activity 1, 2, 9, 10 Reader	Pages 13-27, 69-84 Pages 9-13

<p>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. 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>Erosion Reader Earth Processes Activity 1, 7-14</p>	<p>Page 2-4 Pages 7-14, 55-112</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>Erosion Reader Earth Processes Activity 1</p>	<p>Pages 2-4 Pages 7-14</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>Earth Processes Activity 1, Science and Social Studies</p>	<p>Page 14</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,</p>	<p>Earth Processes Activity 2, Science Challenge</p>	<p>Page 20</p>

and that life has existed on Earth for over 3 billion years.		
12.7.90 Understand that life on Earth has been changed by major catastrophes (e.g., the impacts of asteroids and volcanic eruptions).		
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.	Weather Forecasting Activity 1, Science Challenge Reader	Page 18 Page 1
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.	Weather Forecasting Activity 9 and 10 Reader	Pages 69-80 Pages 4, 7
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.	Weather Forecasting Activity 7 and 8 Reader Oceans Reader	Pages 55-68 Pages 2-4, 6-7 Page 10
Water 12.7.94 Identify the basic stages in the hydrologic cycle on Earth, namely evaporation, condensation, and precipitation.	Weather Forecasting Activity 9 Oceans Activity 5	Pages 69-74 Pages 55-63
12.7.95 Understand that water is a solvent.	Chemical Interactions Activity 3	Pages 23-28
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.	Oceans Activity 1 Reader	Pages 13-22 Page 2
ASTRONOMY (Standard F)	<i>DSM Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
12.7.97 Understand that objects in our solar system	Earth, Moon and Sun Activity 1, 2, 6-12	Pages 7-21, 46-103

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.	Astronomy Activity 5	Pages 43-51
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.	Earth, Moon and Sun Activity 4-5, 12 Astronomy Activity 6	Pages 29-43, 95-103 Pages 53-60
12.7.99 Understand that rock samples taken by astronauts walking on the moon show that the earth and moon have a common history.		
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 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.	Earth, Moon and Sun Activity 3 and 4 Astronomy Activity 6	Pages 23-35 Pages 53-60
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.	Earth, Moon and Sun Activity 10	Pages 79-86
12.7.102 Understand that valleys on the surface of a planet or moon might be evidence that water is or once was there.		
12.7.103 Understand that the speed of a planet's rotation is one cause of the daily variations in temperature on its surface.		
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	Solar Energy Activity 6, Science Extension Earth, Moon and Sun Activity 9 Astronomy Activity 5	Page 46 Pages 69-78 Pages 43-51

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.		
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.	Earth, Moon and Sun Activity 3 Astronomy Activity 6, 10	Pages 23-28 Pages 53-60, 85-91
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).	Earth, Moon and Sun Activity 9-11 Astronomy Activity 5	Pages 69-93 Pages 43-51
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.	Astronomy Activity 8	Pages 69-75

Science - Goal 13: Understand the relationships among science, technology, and society.

SAFETY and PRACTICES OF SCIENCE (Standard A)	<i>DSM 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.	Simple Machines Color and Light Electrical Connections Chemical Interactions	Pages 51, 87, 122 Pages 16, 26, 75, 140 Pages 47, 49 Pages 10, 75, 77, 83, 95
13.7.02 Explain how peer	DSM modules provide the	

review helps to assure the accurate use of data and improves the scientific process.	opportunity for the teaching of these concepts. See for example: Pond Life Activity 12 Fungi-Small Wonders Activity 7 Plants in Our World Activity 3	Pages 81-86 Pages 45-49 Pages 19-24
13.7.03 Indicate that repeatability of results is necessary for the scientific community to accept someone's findings.	DSM modules provide the opportunity for the teaching of these concepts. See for example: Solar Energy Activity 3-8 You and Your Body Activity 3 Famous Scientists Activity 7	Pages 21-58 Pages 27-31 Pages 65-75
13.7.04 Understand that one datum is not sufficient 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.	DSM modules provide the opportunity for the teaching of these concepts. See for example: Fungi-Small Wonders Activity 7 Pond Life Activity 12 Chemical Interactions Activity 12	Pages 45-49 Pages 81-86 Pages 87-92
13.7.05 Understand that the scientific community establishes and observes certain conventions about nomenclature, units of measurement, and ways of presenting data.	DSM modules provide the opportunity for the teaching of these concepts. See for example: Solar Energy Activity 3-8 Weather Forecasting Activity 3 Newton's Toy Box Activity 7-9	Pages 21-58 Pages 25-32 Pages 39-54
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).	Pollution Activity 4, Science and Health Weather Forecasting Activity 12 Activity 12, Science and Health Earth Processes Activity 8, Science and Health	Page 38 Pages 87-93 Page 93 Page 68
13.7.07 Understand that important social decisions	DNA-From Genes to Proteins	

are made on the basis of risk/benefit analysis (e.g. whether or not to administer a smallpox vaccine).	Activity 12, Science, Technology, and Society Activity 13, Science and Social Studies	Page 87 Page 94
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.	Electromagnets Activity 9, Science, Technology, and Society Simple Machines Reader Flight and Rocketry Reader Electrical Connections Activity 10, Science, Technology, and Society DNA-From Genes to Proteins Activity 13, Science Extension	Page 68 Page 15 Pages 8-13 Page 70 Page 94
SCIENCE, TECHNOLOGY, SOCIETY (Standard B)	<i>DSM 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.	Oceans Activity 12, Science and Careers You and Your Body Reader Color and Light Reader Famous Scientists Activity 1-12 Astronomy Activity 1, Science Extension	Page 142 Pages 12-13 Page 14 Pages 11-121 Page 16
13.7.10 Understand that society influences science because social priorities often influence research priorities.	DSM modules provide the opportunity for the teaching of these concepts. See for example: Pollution Activity 10, Science and Social Studies Reader Astronomy Activity 6, Science, Technology, and Society DNA-From Genes to Proteins Activity 12	Page 76 Pages 5, 8, 12, 15 Page 60 Pages 81-87
13.7.11 Understand that natural resources are materials from the	Pollution Reader Rocks and Minerals	Page 5

environment that are used by people. Distinguish between renewable and non-renewable resources.	Activity 10, Science and Social Studies Activity 11 Earth Processes Activity 4, Science, Technology, and Society	Page 84 Pages 85-92 Page 38
13.7.12 Understand that pollution is the contamination of soil, water or the atmosphere by the discharge of harmful substances	Pollution Activity 1-10 Reader	Pages 13-76 Pages 1-15
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.	Rocks and Minerals Activity 10, Science and Social Studies Pollution Activity 6 Reader Earth Processes Activity 4, Science, Technology, and Society	Page 84 Page 47-52 Pages 6-8 Page 38
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).	Pollution Activity 4, Science Challenge Activity 10, Science and Social Studies DNA-From Genes to Proteins Activity 12, Science, Technology, and Society	Page 38 Page 76 Page 87
MEASUREMENT (Standard C)	<i>DSM Investigations that prepare students for this assessment</i>	<i>Page Numbers</i>
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.	Simple Machines Activity 1-6 Solar Energy Activity 2-8 Newton's Toy Box Activity 7-9 Chemical Interactions Activity 1 and 2	Pages 13-55 Pages 13-58 Pages 39-54 Pages 7-21
13.7.16 Work in both Celsius and Fahrenheit, and understand the differences between these types of measurement.	Weather Forecasting Activity 3 Activity 3, Science and Math Solar Energy Activity 2-8 Activity 2, Science and Math	Pages 25-32 Page 32 Pages 13-58 Page 19
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.	Famous Scientists Activity 1 Chemical Interactions Activity 1, Science Challenge	Pages 11-19 Page 13
13.7.18 Select appropriate scientific instruments and technological devices to take measurements, perform calculations, organize data, or make observations.	Simple Machines Activity 1-6 Solar Energy Activity 2-8 Weather Forecasting Activity 3	Pages 13-55 Pages 13-58 Pages 25-32

	Newton's Toy Box Activity 7-9 Chemical Interactions Activity 1 and 2	Pages 39-54 Pages 7-21
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