

*"Our mission is to prepare each student to be a successful and responsible member of society."*

*North Smithfield School District*

## ***Sixth Grade Science Curriculum***

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### **North Smithfield Scope and Sequence SCIENCE Curriculum: K-12**

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# Earth's Atmosphere Unit Design

Grade 6

<p style="text-align: center;">Texts to be used:</p> <p style="text-align: center;">McDougal Littell &amp; *Unit Resource Book (URB) where noted</p>	<h2 style="margin: 0;">Earth's Atmosphere (EA)</h2>
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**RI Statements of Enduring Knowledge - (Established Goals):**

ESS1 - The Earth and earth materials as we know them today have developed over long periods of time, through continual change processes.

ESS2 - The earth is part of a solar system, made up of distinct parts that have temporal and spatial interrelationships.

PS1 - All living and nonliving things are composed of matter having characteristic properties that distinguish one substance from another (independent of size or amount of substance).

PS2 - Energy is necessary for change to occur in matter. Energy can be stored, transferred, and transformed, but cannot be destroyed.

<p style="text-align: center;"><b>Related Rhode Island GSE's</b> (Understandings)</p>	<p style="text-align: center;"><b>RI Assessment Targets</b> Assessment Evidence</p>
<p><b>ESS1 (5-6)–2</b> <b>Students demonstrate an understanding of processes and change over time within earth systems by ...</b></p> <p><b>2a</b> <u>diagramming, labeling and explaining the processes of the water cycle including evaporation, precipitation, and run-off, condensation, transpiration, and groundwater.</u></p> <p><b>2b</b> <u>explaining how condensation of water vapor forms clouds which affects climate and weather.</u></p> <p><b>2c</b> <u>developing models to explain how humidity, temperature, and altitude affect air pressure and how this affects local weather.</u></p> <p><b>2d</b> <u>identifying composition and layers of earth's atmosphere.</u></p> <p><i>ESS1 (5-6)–4</i></p>	<p><b>ESS1 (5-8) SAE–2</b> <i>Explain the processes that cause the cycling of water into and out of the atmosphere and their connections to our planet's weather patterns.</i></p> <ul style="list-style-type: none"> <li>• Text reference: 2.3, pp.56-63 <b>(EA)</b></li> <li>• Investigation: How does condensation occur? P.56</li> </ul> <p>Class Discussion: <b>Water Cycle p.57 EA)</b></p> <ul style="list-style-type: none"> <li>• Discuss the Carbon Cycle;The nitrogen cycle</li> <li>• Investigation p.59, How does a cloud form?</li> <li>• URB P. 113</li> </ul> <p><b>ESS1 (5-8) SAE+ POC –4</b> <i>Explain the role of differential heating or convection in ocean currents, winds, weather and weather patterns, atmosphere, or climate.</i></p> <ul style="list-style-type: none"> <li>• Text reference 4.0-4.3, pp. 114-139</li> <li>• Investigation: How does the angle of light affect heating? P. 117, <b>(EA)</b></li> <li>• Investigation: How quickly do soil and water heat and cool? P. 119 <b>(EA)</b></li> </ul> <p>Class discussion: Climate classification; p.127 <b>(EA)</b></p>

ESS2 (7-8)-8

Students demonstrate an understanding of temporal or positional relationships between or among the Earth, sun, and moon by ...

**8a** Using or creating a model of the Earth, sun and moon system to show rotation and revolution.

**8b** explaining night/day, seasons, year, and tides as a result of the regular and predictable motion of the Earth, sun, and moon.

**8c** using a model of the Earth, sun, & moon to recreate the phases of the moon.

ESS2 (5-6)-8

Students demonstrate an understanding of temporal or positional relationships between or among the Earth, sun, and moon by ...

**8a** Using models to describe the relative position/motion of the Earth, sun, and moon.

**8b** explaining night/day, seasons, year, and tides as a result of the regular and predictable motion of the Earth, sun, and moon.

**8c** using a model of the Earth, sun, & moon to recreate the phases of the moon.

**PS2 (5-8)** Students demonstrate an understanding of processes and change over time within earth systems by ...

**4a** explaining how differential heating and convection affect Earth's weather patterns.

**4b** describing how differential heating of the oceans affects ocean currents which in turn influence weather and climate.

**4c** explaining the relationship between differential heating /convection and the production of winds.

**4d** analyzing global patterns of atmospheric movements to explain effects on weather.

**4e** predicting temperature and precipitation changes associated with the passing of various fronts.

ESS2 (5-8) SAE+ POC –8

*Explain temporal or positional relationships between or among the Earth, sun, and moon (e.g., night/day, seasons, year, tides) or how gravitational force affects objects in the solar system (e.g., moons, tides, orbits, satellites)*

Text reference: Chapter 2.2 pp.47-55 (EA)

- Investigation: How does the Earth's shape affect solar heating? P. 47 (EA)
- Investigation: How does the Earth's rotation affect wind? (Coriolis effect) P.49 (EA)

● **URB p.102**

- Class discussion "Global Winds" p. 51 (EA)

Class discussion "Navigate the Jet Stream" p. 55 (EA)

- Text reference 4.0-4.3, pp. 114-139

- Investigation: How does the angle of light affect heating? P. 117, (EA)

- Investigation: How quickly do soil and water heat and cool? P. 119 (EA)

● **URB P. 119**

Class discussion: Climate classification; p.127 (EA)

**PS1 (5-8) SAE+MAS – 4**

*Represent or explain the relationship between or among energy, molecular motion, temperature, and states of matter.*

- Text Reference: Chapter 1 pp. 9-25(EA)

- Investigation: "How heavy is paper?"p.7 (EA)

- Investigation: How does air affect falling objects? (EA)

- Investigation: How do you know that air has different gases? P.10 (EA)

● **URB P.23**

- Discuss the Carbon Cycle;The nitrogen cycle

- Text reference: 2.3, pp.56-63 (EA)

- Text reference 2.1-2.2 pp. 43-54(EA)

- Investigation; What does air do to the egg? P. 43 (EA) or use Spangler Video

- Investigation: How can you measure changes in air pressure? P. 45, (EA)

● **URB P. 91**

- Class discussion p. 48 "How Wind Forms"

**PS1 (7-8) –1**

**Students demonstrate an understanding of characteristic properties of matter by ...**

**1a** measuring mass and volume of both regular and irregular objects and using those values as well as the relationship  $D=m/v$  to calculate density

**PS1 (7-8) – 4**

**Students demonstrate an understanding of states of matter by ...**

**4c** observing the physical processes of evaporation and condensation, or freezing and melting, and accounting for these changes in terms of molecular motion and conservation of mass.

**PS2 (7-8) -7**

**Students demonstrate an understanding of heat energy by...**

**7b** explaining the difference among conduction, convection and radiation and creating a diagram to explain how heat energy travels in different directions and through different materials by each of these methods.

**PS2 (5-8) INQ+SAE+POC – 7**

*Use data to draw conclusions about how heat can be transferred (convection, conduction, radiation).*

- Investigation: How does heating affect air? P.7 (EA)
- Natural processes modify the atmosphere: ; **The water cycle**, p. 12 EA
- Text reference: 1.3 pp.22-25 (EA)
- Investigation: Can you feel radiation?
- Discuss the Ozone Layer, p. 23 (EA)

*PS1 (5-8) INQ-1*

**Investigate the relationships among mass, volume and density**

- Text reference: 2.3, pp.56-63 (EA)

**Additional Resources: PBS Video Streaming**

Texts to be used: <b>McDougal Littell</b> & *Unit Resource Book (URB) where noted		Earth's Atmosphere (EA)	
	Focus Questions (Essential Questions)	Instructional Activities & Investigations (INQ)	Big Ideas (Understandings)
1	What is the atmosphere?	<ul style="list-style-type: none"> <li>Text Reference: Chapter 1.0 -1.3 (EA) pp.9-25</li> <li>Investigation: "How heavy is paper?"p.7 (EA)</li> <li>Investigation: How does heating affect air? P.7 (EA)</li> <li>Investigation: How does air affect falling objects? (EA) p.9</li> <li>Investigation: How do you know that air has different gases? P.10 (EA)</li> <li>URB P.23</li> </ul>	<ul style="list-style-type: none"> <li>The atmosphere is the layer of gases surrounding Earth and moves energy.</li> <li>Weather happens in the troposphere.</li> <li>The troposphere is the mixture of nitrogen, oxygen and other gases, including water vapor.</li> <li>Air has mass and can be compressed.</li> <li>The atmosphere acts as a greenhouse keeping the Earth warm.</li> </ul>
2	What is Weather?	<ul style="list-style-type: none"> <li>Natural processes modify the atmosphere: Discuss the Carbon Cycle;The nitrogen cycle; <u>The water cycle</u> p. 12 EA</li> </ul>	<ul style="list-style-type: none"> <li>Weather is the condition of Earth's atmosphere at a given time in a given place.</li> <li>Severe weather occurs all over the Earth. Meteorology is the science of weather, and meteorologists are the people who study Earth's weather.</li> </ul>
3	What causes radiation and conduction?	<ul style="list-style-type: none"> <li>Text reference: 1.3 pp.22-25 (EA)</li> <li>Investigation: Can you feel radiation? P.22</li> <li>Discuss the Ozone Layer, p. 23 (EA)</li> </ul>	<ul style="list-style-type: none"> <li>Heat is kinetic energy of atoms and molecules.</li> <li>The Sun is the major source of energy that heats the atmosphere.</li> <li>Energy moves from one material to another by radiation and conduction.</li> <li>Gases in the atmosphere absorb radiation</li> </ul>

4	<p><b>What affects weather throughout the world?</b></p> <p><b>&amp;</b></p> <p><b>What causes the seasons?</b></p>	<ul style="list-style-type: none"> <li>• Text reference: Chapter 2.2 pp.47-55 (EA)</li> <li>• Investigation: How does the Earth's shape affect solar heating? P. 47 (EA)</li> <li>• Investigation: How does the Earth's rotation affect wind? (Coriolis effect) P.49 (EA)</li> <li>• <b>URB p.102</b></li> <li>• Class discussion "Global Winds" p. 51 (EA)</li> <li>• Class discussion "Navigate the Jet Stream" p. 55 (EA)</li> </ul>	<ul style="list-style-type: none"> <li>• Earth's axis of rotation tilted at an angle of 23.5 degrees and always points at the North Star.</li> <li>• The angle at which light from the Sun strikes the surface of Earth is the solar angle.</li> <li>• Coriolis effect</li> <li>• Jet stream and weather patterns</li> </ul>
5	<p><b>What is energy transfer?</b></p> <p><b>How does energy transfer cause convection?</b></p>	<ul style="list-style-type: none"> <li>• Text reference: 2.3, pp.56-63 (EA)</li> </ul>	<ul style="list-style-type: none"> <li>• Density is the ratio of a mass and its volume.</li> <li>• As matter heats up, it expands, causing the matter to become less dense.</li> <li>• Convection is the circulation of fluid that results from energy transfer.</li> </ul>
6	<p><b>How does water does water get into the air?</b></p> <p><b>How does water condense out of the air?</b></p>	<ul style="list-style-type: none"> <li>• Text reference: 2.3, pp.56-63 (EA)</li> <li>• Investigation: How does condensation occur? P.56</li> <li>• Class Discussion: <b>Water Cycle p.57 (EA)</b></li> <li>• Investigation: How does a cloud form? P.59</li> <li>• URB P. 113</li> </ul>	<ul style="list-style-type: none"> <li>• Water changes from gas to liquid by condensation.</li> <li>• Water changes from liquid to gas by evaporation of water; water condenses to form clouds; water falls to the earth's surface via precipitation. The process involves heat from the surroundings.</li> <li>• A water molecule might follow many different paths as it travels in the water cycle.</li> </ul>

7	<p><b>What is the relationship between air pressure and wind?</b></p>	<ul style="list-style-type: none"> <li>• Text reference 2.1-2.2 <b>(EA)</b> pp.43-54</li> <li>• Investigation; What does air do to the egg? P. 43 <b>(EA)</b></li> <li>• Investigation: How can you measure changes in air pressure? P. 45, <b>(EA)</b></li> <li>• <b>URB P.91</b></li> <li>• Class discussion p. 48 “How Wind Forms”</li> </ul>	<ul style="list-style-type: none"> <li>• Pressure exerted on a gas reduces its volume and increases its density.</li> <li>• Differential heating of Earth’s surface by the Sun can create high- and low- pressure areas.</li> <li>• Wind is a movement of air from an area of high pressure to an area of low pressure.</li> <li>• Local winds blow in predictable ways determined by local differential heating.</li> <li>• Wind speed is measured with an instrument called an anemometer.</li> <li>• Air pressure is represented on a map by contour lines called isobars.</li> </ul>
8	<p><b>What is climate?</b></p> <p><b>What is the difference between weather and climate?</b></p>	<ul style="list-style-type: none"> <li>• Text reference 4.1-4.3, pp. 114-139</li> <li>• Investigation: How does the angle of light affect heating? P. 117, <b>(EA)</b></li> <li>• Investigation: How quickly do soil and water heat and cool? P. 119 <b>(EA)</b></li> <li>• <b>URB p.119</b></li> <li>• Class discussion: Climate classification; p.127 <b>(EA)</b></li> </ul>	<ul style="list-style-type: none"> <li>• Air masses are large bodies of air that are uniform in temperature and humidity.</li> <li>• A front is a boundary that separates two air masses.</li> <li>• Weather conditions change as a front passes by.</li> <li>• Climate is the average weather over time.</li> </ul>



# The Earth's Surface

Grade 6

Text to be used:

The Earth's Surface (ES)

McDougal Littell & \*Unit Resource Book (URB) where noted

## RI Statements of Enduring Knowledge - (Established Goals):

ESS1 - The Earth and earth materials as we know them today have developed over long periods of time, through continual change processes.

ESS2 - The earth is part of a solar system, made up of distinct parts that have temporal and spatial interrelationships.

PS2 - Energy is necessary for change to occur in matter. Energy can be stored, transferred, and transformed, but cannot be destroyed.

<b>Related Rhode Island GSE's</b> (Understandings)	<b>RI Assessment Targets</b> Assessment Evidence
<p><b>ESS1 (5-6)-1</b> <b>Students demonstrate an understanding of processes and change over time within earth systems by ...</b></p> <p><b>1a</b> <u>identifying and describing the layers of the earth.</u></p> <p><b>1b</b> <u>plotting location of volcanoes and earthquakes and explaining the relationship between the location of these phenomena and faults.</u></p> <p><b>Students demonstrate an understanding of characteristic properties of matter by ...</b></p> <p><b>1a</b> measuring mass and volume of both regular and irregular objects and using those values as well as the <u>relationship <math>D=m/v</math> to calculate density.</u></p> <p><b>ESS1 (7-8)-3</b><b>Students demonstrate an understanding of processes and change over time within earth systems by ...</b></p> <p><b>3a</b> <u>evaluating slow processes (e.g. weathering, erosion, mountain building, sea floor spreading) to determine how the earth has changed and will continue to change over time.</u></p> <p><b>3b</b> <u>evaluating fast processes (e.g. erosion, volcanoes and earthquakes) to determine how the earth has changed and will continue to change over time.</u></p> <p><b>3c</b> <u>investigating the effect of flowing water on landforms (e.g. stream table, local environment).</u></p>	<p><b>ESS1 (5-8) INQ+ POC -1</b> <b>Use geological evidence provided to support the idea that the Earth's crust/lithosphere is composed of plates that move.</b></p> <ul style="list-style-type: none"> <li>• Text Reference: Chapter 1.1 -1.4 pp.6-30 (ES)</li> <li>• Investigation: P.7 Explore; Using Modern Maps (ES)</li> <li>• Investigation:p.13 How can you model the geosphere's layers?</li> <li>• URB p.20</li> <li>• Investigation: p.15 What makes a good map? (ES)</li> <li>• Math connection: Activity, p.23 How far is it? (ES)</li> <li>• Investigation: P.28 Topographic Maps (ES)</li> <li>• <b>URB P. 61-63</b></li> <li>• Investigation: P. 32 Satellite imaging (ES)</li> </ul> <p><b>ESS1 (5-8) INQ+ POC -5</b> <i>Using data about a rock's physical characteristics make and support an inference about the rock's history and connection to rock cycle.</i></p> <ul style="list-style-type: none"> <li>• Text reference: 2.1 -2.3,pp. 40-61(ES)</li> <li>• Investigation: Explore: How do you turn water into a mineral and what makes up rocks? P.41 (ES)</li> <li>• Investigation: What are some characteristics of a mineral? P.43 (ES)</li> <li>• Investigation: How do crystals differ in shape? P.46 (ES)</li> <li>• <b>URB p.40</b></li> <li>• Investigation; Hardness of minerals, p.56 (ES)</li> <li>• <b>URB p.102</b></li> <li>• Investigation; 58-59 Mineral Identification, (ES)</li> <li>• Class discussion: Mineral Formation, reading diagram, p.63 (ES)</li> <li>• <b>Introduce density: No algebraic manipulations, just using concept and formula. This will again be used in grade 8.</b></li> </ul>

**ESS1 (5-6)-5**

**Students demonstrate an understanding of processes and change over time by ...**

**5a** representing the processes of the rock cycle in words, diagrams, or models.

**5b** citing evidence and developing a logical argument to explain the formation of a rock, given its characteristics and location. (e.g. classifying rock type using identification resources

- Text reference: 3.0 -3.4 P.72-103 **(ES)**
- Investigation: How can rocks disappear? p.73 **(ES)**
- Investigation: How do rocks differ from minerals? P.75 **(ES)**
- Investigation: How can rocks be classified? P.77 **(ES)**
- **URB P> 153**
- Class discussion: The rock cycle, pp.78-79 /Have students describe in writing the meaning of the diagram, p.79. **(ES)**
- Class discussion: Crystal size and Cooling time, p.84 **(ES)**
- **URB P.165**

**Text to be used:**

**McDougal Littell**

& \*Unit Resource Book (URB) where noted

**The Earth's Surface (ES)**

	<b>Focus Questions (Essential Questions)</b>	<b>Instructional Activities &amp; Investigations (INQ)</b>	<b>Big Ideas (Understandings)</b>
<b>1</b>	<b>How has technology changed our view of the earth?</b>	<ul style="list-style-type: none"> <li>• Text Reference: Chapter 1.0-1.1 -1.4 pp.6-30 <b>(ES)</b></li> <li>• Investigation: P.7 Explore; Using Modern Maps <b>(ES)</b></li> <li>• Investigation:p.13 How can you model the geosphere's layers?</li> <li>• URBP.20</li> <li>• Investigation: p.15 What makes a good map? <b>(ES)</b></li> <li>• Math connection: Activity, p.23 How far is it? <b>(ES)</b></li> <li>• Investigation: P.28 Topographic Maps <b>(ES)</b></li> <li>• <b>URB P.61-63</b></li> <li>• Investigation: P. 32 Satellite imaging <b>(ES)</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Mapping</b> the Earth's surface</li> <li>• What are the layers of the <b>Geosphere?</b></li> <li>• Earth has four main layers: <b>crust, mantle, outer core, and inner core</b></li> <li>• All four parts of the Earth's system, <b>atmosphere, hydrosphere, geosphere, and biosphere</b> helped shape the earth's surface.</li> </ul>
<b>2</b>	<b>What are characteristics used to identify minerals?</b>	<ul style="list-style-type: none"> <li>• Text reference: 2.0 -2.3,pp. 40-61<b>(ES)</b></li> <li>• Investigation: Explore: How do you turn water into a mineral and what makes up rocks? P.41 <b>(ES)</b></li> <li>• Investigation: What are some characteristics of a mineral? P.43 <b>(ES)</b></li> <li>• Investigation: How do crystals differ in shape? P.46 <b>(ES)</b></li> <li>• URB P&gt;40</li> </ul>	<ul style="list-style-type: none"> <li>• Minerals have a definite chemical makeup/composition</li> <li>• Each mineral has its own crystal structure</li> <li>• Minerals are grouped according to composition</li> </ul>

3	<p><b>How are properties used to identify minerals?</b></p>	<ul style="list-style-type: none"> <li>Investigation; Hardness of minerals, p.56 <b>(ES)</b></li> <li>Investigation; 58-59 Mineral Identification, <b>(ES)</b></li> <li>Class discussion: Mineral Formation, reading diagram, p.63 <b>(ES)</b></li> <li><b>Introduce density: No algebraic manipulations, just using concept and formula. This will again be used in grade 8.</b></li> </ul>	<ul style="list-style-type: none"> <li>A mineral's appearance helps identify it.</li> <li><b>Color and streak</b></li> <li><b>Luster</b></li> <li>Mineral breakage help identify structure: <b>Cleavage and Fracture</b></li> <li><b>Density and hardness</b> can be used to identify minerals</li> <li><b>Hardness</b> is measured on the <b>Mohs Scale</b></li> </ul>
4	<p><b>What is the rock cycle?</b></p>	<ul style="list-style-type: none"> <li>Text reference: 3.0 -3.4 P.72-103 <b>(ES)</b></li> <li>Investigation: How can rocks disappear? p.73 <b>(ES)</b></li> <li>Investigation: How do rocks differ from minerals? P.75 <b>(ES)</b></li> <li>Investigation: How can rocks be classified? P.77 <b>(ES)</b></li> <li><b>URB P.153</b></li> <li>Class discussion: The rock cycle, pp.78-79 /Have students describe in writing the meaning of the diagram, p.79. <b>(ES)</b></li> <li>Class discussion: Crystal size and Cooling time, p.84 <b>(ES)</b></li> <li><b>URB P.165</b></li> </ul>	<ul style="list-style-type: none"> <li>Teaching note: <u>Using the Earth's Surface text</u> (ES) for pages cited, review "Rock Cycle" with students. Students in grade four use FOSS kit, Earth Materials that lays a foundation for introducing or review ing the rock cycle. This is a foundation to begin "Plate tectonics" study.</li> <li>The <b>Rock Cycle</b> shows how rocks change over time</li> <li><b>Igneous</b> rocks form from molten rock</li> <li><b>Sedimentary</b> rock forms from earlier rock</li> <li><b>Metamorphic</b> rocks form as existing rocks change.</li> </ul>

<p>9</p>	<p><b>What is the geological evidence for plate movement?</b></p>	<ul style="list-style-type: none"> <li>• Text reference: 4.0 -4.3,pp.110 - 137, <b>(CE)</b></li> <li>• Investigation: How do you know what happened? P. 109, <b>(CE)</b></li> <li>• Investigation: What can we learn from a rock? P. 111, <b>(CE)</b></li> <li>• Investigation: Learning from tree rings, p. 116, <b>(CE)</b></li> <li>• Class discussion: Assign groups rock layer photos in text and find evidence and claims from text, Section 4.2, pp.119-125, <b>(CE)</b></li> <li>• Introduce half-life using an investigation of pennies and beans. Start with fixed number of pennies and gradually change into beans by replacement. Emphasize graphing and time measured in “throws.” Then connect to reading and discussion of text graph, “Dating Mammoth Bones”,p.126, <b>(CE)</b></li> </ul>	<ul style="list-style-type: none"> <li>• Earth’s past is revealed in rocks and fossils</li> <li>• Rocks provide a timeline for Earth</li> <li>• Plate Tectonics theory explains the geological time scale of the earth’s surface</li> <li>• Fossil evidence</li> <li>• Radioactivity evidence – Dating fossil evidence</li> </ul>
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## Space Science

Middle School –Grade 6

Texts to be used:

McDougal Littell & \*Unit Resource Book (URB) where noted

Space Science (SS)

**RI Statements of Enduring Knowledge - (Established Goals):**

ESS2 The earth is part of a solar system, made up of distinct parts that have temporal and spatial interrelationships.

PS2 Energy is necessary for change in matter. Energy can be stored, transferred, and transformed, but cannot be destroyed.

PS3 The motion of an object is affected by forces.

Related Rhode Island GSE's (Understandings)	RI Assessment Targets Assessment Evidence
<p><b>SS2 (7-8) -8</b>  <b>Students demonstrate an understanding of gravitational relationships between or among objects of the solar system by...</b>                      8f explaining that the sun's gravitational pull holds the Earth and other planets in their orbits, just as the planet's gravitational pull keeps their moons in orbit.                      The following are just introduced at the grade six level but, will be discussed in more depth at grade 8 with Forces &amp; Motion</p> <p>ESS2 (5-6)-8  <b>Students demonstrate an understanding of gravitational relationships between or among objects of the solar system by..</b>                      8d <u>defining the Earth's gravity as a force that pulls any object on or near the Earth toward its center without touching it.</u></p> <p>ESS2 (7-8)-8  <b>Students demonstrate an understanding of gravitational relationships between or among objects of the solar system by..</b>                      8f <u>explaining that the sun's gravitational pull holds the Earth and other planets in their orbits just as the planet's pull keeps their moon's in orbit.</u></p>	<p><b>ESS2 (5-8) SAE+ POC –8</b>  <i>Explain temporal or positional relationships between or among the Earth, sun, and moon (e.g., night/day, seasons, year, tides) or how gravitational force affects objects in the solar system (e.g., moons, tides, orbits, satellites).</i></p> <ul style="list-style-type: none"> <li>• Reference Chapter 2.0-2.2, pp.40 -51 <b>(SS)</b></li> <li>• Investigation "How do shadows move?" P41 <b>(SS)</b></li> <li>• Activity "What time is it in Iceland right now?" p.43 <b>(SS)</b></li> <li>• <b>URB P.91</b></li> <li>• Investigation: What causes day and night? P.44 <b>(SS)</b></li> <li>• Class discussion: Interpreting and modeling "Seasons" diagram, p. 47 <b>(SS)</b> -Earth's Tilted axis and orbit:</li> <li>• URB P.92</li> <li>• Investigation: Modeling Seasons" p. 50 &amp; 51 <b>(SS)</b></li> <li>• <b>URB pp. 124-132</b></li> <li>• Reference Chapter 2.3 pp.58-66 <b>(SS)</b></li> <li>• Investigation: Why does the moon seem to change shape? P.62 <b>(SS)</b></li> <li>• <b>URB P. 114</b></li> <li>• Investigation: Moon Features, p. 55, <b>(SS)</b></li> <li>• <b>URB P. 103</b></li> </ul>

**Text to be used:  
McDougal Littell**

& \*Unit Resource Book (URB) where noted

**Space Science (SS)**

	<b>Focus Questions (Essential Questions)</b>	<b>Instructional Activities &amp; Investigations (INQ)</b>	<b>Big Ideas (Understandings)</b>
1	<p>What keeps planets in orbit around the sun?</p> <p>What keeps "moon(s) orbiting planets?</p>	<ul style="list-style-type: none"> <li>Reference Chapter 2.0-2.2, pp.40 -51 <b>(SS)</b></li> <li>Investigation "How do shadows move?" P.41 <b>(SS)</b></li> <li>Activity "What time is it in Iceland right now?" p.43 <b>(SS)</b></li> <li><b>URB P.91</b></li> </ul>	<ul style="list-style-type: none"> <li>The sun's gravitational pull holds the Earth and other planets in their orbits, just as the planet's gravitational pull keeps their moons in orbit.</li> <li>The annual orbit around the sun is 365 ¼ days approximately.</li> </ul>
2	<p>What causes day &amp; night?</p> <p>What causes seasons?</p> <p>What causes tides, that we observe on earth?</p>	<ul style="list-style-type: none"> <li>Investigation: What causes day and night? P.44 <b>(SS)</b></li> <li>Class discussion: Interpreting and modeling "Seasons" diagram, p. 47 <b>(SS)</b> - Earth's Tilted axis and orbit:</li> <li>URB P.92</li> </ul>	<ul style="list-style-type: none"> <li>The rotation of the Earth on its axis =24 hours</li> <li>The tilt of the Earth on its axis is 23.5 degrees as it orbits the sun (365.25 days)</li> <li>The moon's gravitational attraction on the earth causes the tides.</li> </ul>
3	<p>How is the motion and orbit of the earth affected by other bodies such as the sun and moon?</p> <p>How are the phases of the moon related to the earth/moon/sun relative positions.</p>	<ul style="list-style-type: none"> <li>Investigation: Modeling Seasons" p. 50 &amp; 51 <b>(SS)</b></li> <li><b>URB pp. 124-132</b></li> <li>Reference Chapter 2.3 pp.58-66 <b>(SS)</b></li> <li>Investigation: Why does the moon seem to change shape? P.62 <b>(SS)</b></li> <li><b>URB P. 114</b></li> </ul>	<ul style="list-style-type: none"> <li>The tilt of the earth on its axis of ration (23.5 degrees) causes the seasons and the seasons are reversed in the two hemispheres.</li> <li>Tides are caused by the moon's gravitational pull on the earth due to its proximity. The phases of the moon related to the earth/moon/sun relative position</li> </ul>
4	<p>How did the Moon's features form?</p>	<ul style="list-style-type: none"> <li>Investigation: Moon Features, p. 55, <b>(SS)</b></li> <li><b>URB P. 103</b></li> </ul>	<ul style="list-style-type: none"> <li>The Moon's surface, as did the Earth's, changed over time</li> </ul>

## Life Over Time (LOT)

Grade 6

Texts to be used:

McDougal Littell & \*Unit Resource Book (URB) where noted

Life Over Time

### RI Statements of Enduring Knowledge - (Established Goals):

LS -1 All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, & species).

LS - 2 Matter cycles and energy flows through an ecosystem.

LS - 3 Groups of organisms show evidence of change over time (structures, behaviors and biochemistry).

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Related Rhode Island GSE's (Understandings)	RI Assessment Targets Assessment Evidence
<p><b>LS3 (7-8) – 8 Students demonstrate an understanding of classification of organisms by ...</b></p> <p><b>8a</b> sorting organisms with similar characteristics into groups based on internal and external structures.</p> <p><b>8b</b> explaining how species with similar evolutionary histories/characteristics are classified more closely together with some organisms than others (e.g., a fish and human have more common with each other than a fish and jelly fish)</p> <p><b>8c</b> recognizing the classification system used in modern biology</p> <p><b>LS3 (7-8)-9 Students demonstrate an understanding of Natural Selection/evolution by...</b></p> <p>9a explaining the genetic variation/traits of organisms are passed on through reproduction and random genetic changes.</p>	<p><b>LS3 (5-8) MAS+FAF – 8</b> <i>Use a model, classification system, or dichotomous key to illustrate, compare, or interpret possible relationships among groups of organisms (e.g., internal and external structures, anatomical features.</i> Text Reference; Chapter: Chapter 2.1-2.3(LOT) Activity: How can you classify leaves? p.46(LOT) URB P.79 Activity: What data do you need to identify objects? p.51(LOT) Chapter Investigation: Making a Field Guide</p> <p><b>LS3 (5-8) – POC - 9</b> <i>Cite examples supporting the concept that certain traits of organisms may provide a survival advantage in a specific environment and therefore, an increased likelihood to produce offspring.</i> Text Reference: Chapter 1.1(LOT) p.9-15 Activity: What can you tell from the marks an object leaves behind? P. 9(LOT) Text Reference; Chapter: Chapter 1.2(LOT) p. 17-25 Chapter Investigation: Modeling Natural Selection, pp.26-27(LOT) URB P.150 Text Reference; Chapter: Chapter 1.2(LOT) Chapter Investigation: Modeling Natural Selection, pp.26-27(LOT)</p>



		<b>Text to be Used :</b>	
		<b>McDougal Littell</b> & *Unit Resource Book (URB) where noted	<ul style="list-style-type: none"> <li>• <b>Life Over Time (LOT)</b></li> </ul>
1	<ul style="list-style-type: none"> <li>• How do scientists learn about the history of life on Earth?</li> <li>• How do you classify living things?</li> <li>• What are kingdoms of living organisms?</li> </ul>	<p>Text Reference; Chapter 1.1(<b>LOT</b>) p.9-15 Activity: What can you tell from the marks an object leaves behind? p.9(<b>LOT</b>)</p> <hr/> <p>Text Reference; Chapter 2.1-2.3(<b>LOT</b>) p.43-67</p> <p>Activity: How can you classify leaves? p.46(<b>LOT</b>) <b>URB P.79</b></p> <p>Activity: What data do you need to identify objects? p.51(<b>LOT</b>) Chapter Investigation: Making a Field Guide(<b>LOT</b>) <b>p.68-69</b></p>	<ul style="list-style-type: none"> <li>• Living things, like Earth itself, change over time.</li> <li>• Scientists have developed a system for classifying the great diversity of living things.</li> </ul>
2	<ul style="list-style-type: none"> <li>• What is natural selection?</li> <li>• How do scientists learn about the history of life on Earth?</li> <li>• How do you classify living things?</li> <li>• What are kingdoms of living organisms?</li> </ul>	<p>Text Reference; Chapter 1.2(<b>LOT</b>) p.17-25 Chapter Investigation: Modeling Natural Selection, pp.26-27(<b>LOT</b>) <b>URB P. 150</b></p> <p>Text Reference; Chapter 1.1(<b>LOT</b>) p.9-15 Activity: What can you tell from the marks an object leaves behind? p.9(<b>LOT</b>)</p>	<ul style="list-style-type: none"> <li>• Darwin developed the theory of natural selection</li> <li>• Survival of organisms determines pool availability to adapt and reproduce.</li> </ul>