

Science Grade 5	Austin ISD Curriculum Road Map (CRM)	2 <sup>nd</sup> 9 Weeks
<b>CRM # 4</b> <b>Name:</b> <i>Sun, Earth and Moon System</i>		<b>Pacing</b> <ul style="list-style-type: none"> <li>• 25 days</li> <li>• Nov. 13-Dec. 20</li> <li>• Week 12-17</li> </ul>
<b>DESIRED RESULTS</b>		
<p style="text-align: center;"><b>Making Meaning</b></p> <p>Concepts in the study of the Sun, Earth, and Moon System help explain many patterns of change we observe in the world around us. Students examine changes in the sky and build an understanding of the Earth and our place in the solar system. These concepts in this unit build a foundation for the study of Astronomy, Climate Change, and Environmental Sciences. The following make meaning valuable for learners and are investigated in this unit:</p> <ul style="list-style-type: none"> <li>• The Sun, Earth, and Moon interact in a system and are intricately interconnected. The motion of the Sun, Earth, and moon and tilt of the Earth cause observable patterns: the apparent movement of the Sun in the sky, day/night, daily and seasonal changes in the length of shadows, seasons, phases of the moon, and the movement of stars in the night sky.</li> <li>• Earth is part of a broader system: the solar system, which is a small part of the Milky Way Galaxy which is one of many galaxies in the universe.</li> <li>• Gravity holds the planets in orbit around the Sun, and the gravity of various planets holds their moons in orbit around them.</li> <li>• The Sun is the major source of energy for Earth, and fuels the water cycle and weather.</li> </ul>		
<p><b>Transfer:</b> Students will observe, graph, and analyze patterns of change in both weather and objects in the sky to build an understanding of interactions among the Sun, Earth, and moon.</p>		
<p><b>Enduring Understandings:</b></p> <ul style="list-style-type: none"> <li>• Earth’s Sun drives many of our cycles on Earth.</li> <li>• We can observe, describe and record objects and patterns in our sky and on Earth.</li> <li>• The Earth, moon, and Sun vary in size, composition, and surface features.</li> <li>• Eight planets of very different size, composition, and surface features orbit the Sun.</li> </ul>	<p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>• How do the patterns and cycles of the Earth, Moon, and Sun system affect us?</li> <li>• How are the planets positioned in our solar system?</li> </ul>	
<p><b>Essential Vocabulary</b></p> <ul style="list-style-type: none"> <li>• atmosphere/ atmósfera</li> <li>• axis/eje</li> <li>• climate/clima</li> <li>• condensation/condensación</li> <li>• corona/ corona</li> <li>• craters/cráteres</li> <li>• equator/ecuador</li> <li>• evaporation/evaporación</li> <li>• gravity/gravedad</li> <li>• ground water/agua subterráneo</li> <li>• ocean currents / las corrientes oceánicas</li> <li>• orbit/órbita</li> <li>• overhead/por lo alto</li> <li>• percolation/percolación</li> <li>• high tide/marea alta</li> <li>• low tide/marea baja</li> </ul>	<ul style="list-style-type: none"> <li>• phase/fase</li> <li>• precipitation/precipitación</li> <li>• rain gauge/pluviómetro</li> <li>• revolution/vuelta</li> <li>• rises/salir</li> <li>• rotation/rotación</li> <li>• saltwater/agua salada</li> <li>• solar flares/ las erupciones solares</li> <li>• solar system /sistema solar</li> <li>• sunrise/salida del</li> <li>• sunset/puesta del sol</li> <li>• sunspots/ los manchas solares</li> <li>• tide/ marea</li> <li>• tilt/inclinación</li> <li>• density /densidad</li> </ul>	<p><b>Supporting Vocabulary Link</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Elementary School Supporting Vocabulary</a></li> </ul>

**Student pre-requisite knowledge**

*Students should know:*

- weather is always changing and occurs locally over a short time.
- thermometers measure temperature (heat energy).
- rain gauges measure precipitation levels.
- wind vanes measure wind direction.
- many weather changes are caused by changes in air pressure systems.
- the water cycle, driven by the Sun’s energy, consists of the movement of water above and on the surface of the Earth, causing patterns and cycles in Earth’s weather.
- water evaporates from the Earth’s surface, rises and cools, condenses into precipitation, and falls again to the surface.
- water that falls to the ground collects in streams, rivers, and lakes, and eventually flows back into the oceans.
- models help us understand the relationships of the Sun, Moon, and Earth system.
- Earth rotates on its axis, causing the Sun to appear to move across the sky and creating changes in shadows throughout the day.
- tides are the alternating rise and fall in sea level with respect to the land, produced by the gravitational attraction of the moon and occur about every 12 hours.
- the Earth orbits the Sun in a 365 day cycle. (one year)
- the Earth tilts on its axis at a 23.5 degree angle. This tilt coupled with the revolution causes direct and indirect lighting in the hemispheres giving Earth different seasons.
- the moon orbits the Earth in a 28 day cycle which causes different parts of the moon to be illuminated and seen from the Earth. (moon phases)
- people cannot determine how the Solar System is put together just by observing the night sky.
- the Earth is one of 8 planets that revolve around the Sun in nearly circular orbits.
- each planet has unique characteristics and a unique position in the Solar System.

**Resources:** AISD Module Kit, Model Lesson Portfolio, FOSS: *Magnetism and Electricity* Investigations, [STEMscopes](#), eBooks: Envisions Science Leveled Readers, Scott Foresman Text, [Science Notebook Resources](#), [BrainPop Jr](#), [Discovery Education](#), [BBC Online Labs, Quizzes, and Activities](#), [Differentiation Strategies & Resources](#)

**ELPS:** Mandated by Texas Administrative Code (19 TAC §74.4), click on the link for [English Language Proficiency Standards \(ELPS\)](#) to support English Language Learners.

TAKS Knowledge & Skills	Acquisition <i>Important knowledge and skills</i>	
STAAR: RC = Reporting Category; DC = Dual Coded Skills; <b>Readiness Standard</b> ; <b>Supporting Standard</b> Concepts are addressed in another unit.	Students Will Know	Students Will Be Able To
5.8 The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to:		
<b>5.8A: differentiate between weather and climate.</b>	<ul style="list-style-type: none"> <li>• weather is always changing and occurs locally over a short time while climate is the pattern of weather in an area over time.</li> </ul>	<ul style="list-style-type: none"> <li>• differentiate between weather and climate.</li> </ul>
<b>5.8B: explain how the Sun and the ocean interact in the water cycle</b>	<ul style="list-style-type: none"> <li>• the water cycle processes as water cycles above, on, and below Earth’s surface.</li> <li>• the Sun is the major source of energy for the water cycle.</li> <li>• the oceans contain most of the Earth’s water.</li> </ul>	<ul style="list-style-type: none"> <li>• investigate water cycle processes.</li> <li>• explain in pictures, words, and writing how water cycles.</li> <li>• explain how the Sun and the ocean interact in the water cycle.</li> </ul>

<p><b><u>5.8C: demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky.</u></b></p>	<ul style="list-style-type: none"> <li>• Earth rotates on its axis.</li> <li>• Earth’s rotation causes day and night.</li> <li>• the Sun appears to move across the sky because of the Earth’s rotation.</li> </ul>	<ul style="list-style-type: none"> <li>• demonstrate the pattern of the Earth’s rotation.</li> <li>• demonstrate day and night cycles.</li> <li>• demonstrate the Earth’s rotation and the Sun’s apparent motion.</li> <li>• explain the day/night cycle using diagrams, models, data from their investigations, and research.</li> </ul>
<p><b><i>5.8D: identify and compare the physical characteristics of the Sun, Earth, and Moon.</i></b></p>	<ul style="list-style-type: none"> <li>• Sun’s characteristics.</li> <li>• Moon’s characteristics.</li> <li>• Earth’s characteristics.</li> <li>• ways they are the same and different.</li> </ul>	<ul style="list-style-type: none"> <li>• collect data, identify characteristics of, and compare the Sun’s, Earth’s, and Moon’s characteristics.</li> </ul>
<p>4.8: Earth and space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to:</p>		
<p><b><i>4.8A: measure and record changes in weather and make predictions using weather maps, weather symbols, and a map key.</i></b></p>	<ul style="list-style-type: none"> <li>• weather is always changing and occurs locally over a short time.</li> <li>• thermometers measure temperature (heat energy.)</li> <li>• rain gauges measure precipitation levels.</li> <li>• wind vanes measure wind direction.</li> <li>• many weather changes are caused by changes in air pressure systems.</li> </ul>	<ul style="list-style-type: none"> <li>• observe, measure and record daily changes in weather over time (temperature, precipitation, wind direction and wind conditions).</li> <li>• graph and compare recorded weather data in different locations.</li> <li>• use weather maps, symbols, and map keys to predict weather.</li> </ul>
<p><b><i>4.8B: describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process.</i></b></p>	<ul style="list-style-type: none"> <li>• the Sun, the major source of energy for Earth, is a medium sized star that provides heat and light energy for the water cycle.</li> <li>• the water cycle consists of the movement of water above and on the surface of the Earth, causing patterns and cycles in Earth’s weather.</li> <li>• water evaporates from the Earth’s surface, rises and cools, condenses into precipitation, and falls again to the surface. Water that falls to the ground collects in streams, rivers, and lakes, and eventually flows back into the oceans.</li> </ul>	<ul style="list-style-type: none"> <li>• create a diagram of the Sun and its effect on Earth.</li> <li>• describe and illustrate the continuous movement of water above and on the surface of Earth.</li> <li>• investigate the water cycle processes through hands-on explorations.</li> </ul>

<p><b>4.8C: collect and analyze data to identify sequences and predict patterns of change in shadows, tides, seasons, and the observable appearance of the Moon over time.</b></p>	<ul style="list-style-type: none"> <li>• models help us understand the relationships of the Sun, Moon, and Earth system.</li> <li>• Earth rotates on its axis, causing the Sun to appear to move across the sky and creating changes in shadows throughout the day.</li> <li>• tides are the alternating rise and fall in sea level with respect to the land, produced by the gravitational attraction of the moon.</li> <li>• tides occur twice a day or about every 12 hours.</li> <li>• the Earth orbits the Sun in a 365 day cycle. (one year)</li> <li>• the Earth tilts on its axis at a 23.5 degree angle. This tilt coupled with the revolution causes direct and indirect lighting in the hemispheres gives Earth different seasons.</li> <li>• the moon orbits the Earth in a 28 day cycle which causes different parts of the moon to be illuminated and seen from the Earth. (moon phases)</li> </ul>	<ul style="list-style-type: none"> <li>• collect and analyze data collected from observations and research, then predict the movement of the Sun in the sky and shadow formation.</li> <li>• collect, analyze and predict tidal occurrence using data from tidal activity.</li> <li>• collect, analyze and predict patterns of change as the Earth goes through the cycle of seasons.</li> <li>• collect, analyze and predict the observable appearance of the moon using models, data, and observations.</li> </ul>
<p>3.8: Earth and space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to:</p>		
<p><b>3.8D: identify the planets in Earth's solar system and their position in relation to the Sun</b></p>	<ul style="list-style-type: none"> <li>• people cannot determine how the Solar System is put together just by observing the night sky.</li> <li>• the Earth is one of 8 planets that revolve around the Sun in nearly circular orbits.</li> <li>• each planet has unique characteristics and a unique position in the Solar System.</li> </ul>	<ul style="list-style-type: none"> <li>• illustrate and describe the position of each of the 8 planets in our solar system.</li> <li>• describe the unique characteristics of each of the planets.</li> </ul>

ASSESSMENT EVIDENCE	
Student Work Products/Assessment Evidence	
Performance Tasks	Other Evidence (i.e. unit tests, open ended exams, quiz, essay, student work samples, observations, etc.)
<ul style="list-style-type: none"> <li>• Students make water cycle journals using content based vocabulary from a word bank.</li> <li>• Students write and perform a weather report to expand and internalize content area vocabulary.</li> <li>• Students track Sun’s shadows and path.</li> <li>• Students explore Sun’s angle and track temperature.</li> <li>• Students track sunrise and sunset and analyze data to formulate conclusions about how the amount of sunlight changes in a pattern during the year.</li> <li>• Students measure time with sundials.</li> <li>• Students research and present information on the planets.</li> </ul>	<p><b>Short Cycle Assessment</b></p> <ul style="list-style-type: none"> <li>• <i>SCA Testing Window: December 3-7, 2012</i> <i>Tested TEKS: 5.8A, 5.8B, 4.8A, 4.8B</i></li> <li>• <i>SCA Testing Window: December 13-20, 2012</i> <i>Tested TEKS: 5.8C, 5.8D, 4.8C</i> <i>TEKS 3.8D will be tested with Earth Science in Jan.</i></li> </ul> <p><b>Additional Suggestions for Assessment</b></p> <ul style="list-style-type: none"> <li>• Student science notebook</li> <li>• Student discussions</li> <li>• Teacher questioning and observations</li> <li>• Students demonstrate mastery of differentiating the difference between weather and climate.</li> <li>• Weather Calendars and Data collection</li> <li>• Graphs and comparisons of climate over time</li> <li>• Descriptions and diagrams of the water cycle including the ocean and identification of real world applications of the water cycle</li> <li>• Analyze pictorial representations and data to predict and recognize patterns of change in shadows, tides, seasons, and moon phases.</li> <li>• Student diagrams, pictures, and explanations of the apparent movement of the Sun and day/night cycles.</li> <li>• Solar system diagrams and/or models</li> <li>• Students use a T-chart to differentiate between weather and climate.</li> <li>• Students collect weather data over time.</li> <li>• Students compare the Earth, Moon, and Sun.</li> </ul>
LESSON PLANNING TOOLS	
<p><b>In the course of lesson planning, it is the expectation that teachers will include whole child considerations when planning such as differentiation, special education, English language learning, dual language, gifted and talented, social emotional learning, physical activity, and wellness.</b></p>	
<p><u><a href="#">WEATHER AND CLIMATE</a></u></p> <ul style="list-style-type: none"> <li>• Weather</li> <li>• Climate</li> </ul> <p>Review Lesson</p> <ul style="list-style-type: none"> <li>• Weather Maps</li> </ul> <p>Suggested Pacing: (4 days)</p> <p>TEKS: 5.8A, 4.8A</p>	

### SUN AND OCEAN INTERACTIONS

- Water, Water Everywhere
  - Currents
- Review Lessons
- Water Cycle Processes Game (optional)
- Suggested Pacing: ( 4 days)  
TEKS: 5.8B, 4.8B

### DAY/NIGHT CYCLE AND SEASONS

- Earth's Rotation and Shadows
  - Earth's Revolution
  - The Reason for the Seasons
- Review Lessons
- Tides
  - Moon Phases
- Suggested Pacing: ( 8 days)  
TEKS: 5.8C, 4.8C

### CHARACTERISTICS OF THE EARTH, MOON, & SUN

- Characteristics of the Moon
  - Characteristics of the Sun
  - Comparing the Sun, Earth, and Moon
- Suggested Pacing: (5 days)  
TEKS: 5.8D

### SOLAR SYSTEM/ PLANETS

- Review Lessons
- Gravity
  - Distance and Size Models of the Planets
- Suggested Pacing (4 days)  
TEKS: 3.8D