CRM 4 Sun, Earth and Moon System	**Pacing** • **25 days** • **Nov. 13-Dec. 20** • **Week 12-17**

DESIRED RESULTS

Making Meaning

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:

- 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.
- 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.
- Gravity holds the planets in orbit around the Sun, and the gravity of various planets holds their moons in orbit around them.
- The Sun is the major source of energy for Earth, and fuels the water cycle and weather.

Transfer: 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. Students will analyze the position of the planets to understand as the Earth and other planets formed, the heavier elements fell to their centers. On planets close to the Sun, the lighter elements were mostly blown or boiled away by radiation from newly formed the Sun. On the outer planets, the lighter elements still surround them as a thick layer of gas or frozen solid layers. So, how the planets are positioned in the solar system gives you an idea of how they were formed and their composition.

Enduring Understandings:	**Essential Questions:**
• Earth's Sun drives many of our cycles on Earth. • We can observe, describe and record objects and patterns in our sky and on Earth. • Eight planets of very different size, composition, and surface features orbit the Sun.	• How do the patterns and cycles of the Earth, Moon, and Sun system affect us? • How are the planets positioned in our solar system?

Essential Vocabulary

- asteroid belt / correa asteroide
- atmosphere / atmósfera
- axis/eje
- condensation / condensación
- Earth/la Tierra
- evaporation/evaporación
- gas/ gaseoso
- gravity/gravedad
- inner planets/planetas interiores
- Jupiter/Júpiter
- location/lugar
- Mars/Marte
- Mercury/Mercurio
- Neptune/Neptuno
- orbit/órbita
- outer planets/planetas exteriores
- precipitation /precipitación
- radiation / radiación
- revolution/vuelta
- rotation/rotación
- saturation / satursación
- Saturn/Saturno
- Sphere/esfera
- solar system/sistema solar
- sunspots/mancha solar
- temperature /temperatura
- thermometer/termómetro
- tilt/inclinación
- UV light / luz ultravioleta
- Uranus/Urano
- Venus/Venus
- wind direction/dirección del viento

Supporting Vocabulary Link

- Elementary School Supporting Vocabulary

Student Prerequisite Knowledge

Students should know:

- weather occurs locally over a short time.
- thermometers measure temperature (heat energy.)
- weather changes are caused by changes are caused by changes in air pressure systems.
- weather can be predicted.
- weather changes from season to season.
- preparing for changes in the weather can keep us safe and prevent illnesses due to weather conditions.
- The water cycle consists of the movement of water above and on the surface of the earth.
- the Sun is the main energy source for the water cycle
- patterns occur in the cycle of the seasons, tides, shadows, and the observable appearance of the Moon.

Resources: AISD Module Kit, Model Lesson Portfolio, STEMscopes, eBooks: Envisions Science Leveled Readers, Scott Foresman Text, Science Notebook Resources, Weather Whiz Kids , Tree House **Weather Kids** - University of Illinois Extension

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.

TEKS Knowledge & Skills	**Acquisition**	
STAAR: RC = Reporting Category; DC = Dual Coded Skills; **Readiness Standard**; ***Supporting Standard*** ~~Concepts~~ are addressed in another unit.	**Students Will Know**	**Students Will Be Able To**
3.8: Earth and space. The student knows there are recognizable patterns in the natural world and among objects in the sky. The student is expected to:		
3.8A: observe, measure, record, and compare day-to-day weather changes in different locations at the same time that include air temperature, wind direction, and precipitation.	• Weather is always changing and occurs locally over a short time. • Thermometers measure temperature (heat energy). • Weather changes are caused by changes in air pressure systems that result from the Sun heating the Earth.	• Observe, measure and record daily weather and changes in weather over time (temperature, precipitation, wind direction and conditions). • Graph and compare recorded weather data in different locations.
3.8B: describe and illustrate the Sun as a star composed of gases that provides light and heat energy for the water cycle.	• The Sun is a medium sized star that provides heat and light energy for the water cycle. • 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. • 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.	• Create a diagram of the Sun and its effect on Earth. • Describe and illustrate the continuous movement of water above and on the surface of Earth. • Investigate the water cycle processes through hands-on explorations.
3.8C: construct models that demonstrate the relationship of the Sun, Earth, and Moon, including orbits and positions.	• Models help us understand the relationships, positions and orbits of the Sun, Moon, and Earth system. • The moon orbits the Earth in a 28 day cycle which causes different	• Construct models of the Sun, moon, and Earth system. • Demonstrate the interactions between all of the parts of the system.

	parts of the moon to be illuminated and seen from the Earth (moon phases). • The Earth orbits the Sun in a 365 day cycle (one year). • The Sun, moon, and Earth all rotate. • The Earth's rotation causes day and night cycles on Earth. • The Earth tilts on its axis at a 23.5 degree angle. This tilt coupled with the revolution gives us the seasons.	• Demonstrate the movement and position of each part of the system. • Describe the interactions of these parts of the system.
3.8D: identify the planets in Earth's solar system and their position in relation to the Sun.	• People cannot determine how the Solar System is put together just by observing the night sky. • The Sun is the center of our Solar System and its gravity keeps all the planets and other objects in orbit around it. • 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.	• Illustrate and describe the position of each of the 8 planets in our solar system. • Describe the unique characteristics of each of the planets.

The study of science is taught through the lens of Scientific Processes (TEKS 3.1-3.4); therefore, these TEKS should be taught in conjunction with content throughout the year. Suggestions for TEKS to embed in each unit are provided in the Yearly Itinerary; however, the TEKS that can be addressed within a unit depends greatly on the learning activities in which students are engaged. Therefore, teachers must be deliberate in their choice of learning activities to ensure that all Scientific Processes TEKS are appropriately embedded within the course. In 3rd grade, districts are encouraged to facilitate laboratory and field investigations for at least 60% of instructional time.

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.)**

• Record daily weather for several weeks by talking about it in daily classroom routines using the sentence stem Today's weather is _____. The temperature is ___. • Measure weather patterns including temperature, rainfall, wind speed, cloud formations, make a graph, and draw conclusions about patterns from the data. • Compare the weather conditions in different places for the same period of time. Infer why the weather patterns are such, based on the location. • Identify weather patterns including the water cycle process from diagrams and lists. • Draw and label to show how water travels through the water cycle. • Water Cycle Labs • Build a Sun, Moon, Earth model • Illustrate and describe the Earth's solar system and present the information to peers in whole class presentations.	**Short Cycle Assessment** • *SCA Testing Window: December 10-14* *Tested TEKS: 3.8A, 3.8B, 3.8C* *TEKS 3.8D tested with Earth Science concepts in Jan.* **Additional Suggestions for Assessment** • Student Interactive Notebook • Student discussions • Weather Calendars and Data collection • Graphs and comparisons of weather form different places • Descriptions of the interactions between the Earth and Sun • Descriptions of the interactions between the Earth and moon • Descriptions of the interactions between the Sun, Earth and moon • Teacher observations: Use of safety rules and equipment • Teacher observations: management and use of tools • Tools foldable/web in Interactive Notebook • Students' use of evidence to support explanations and claim.

LESSON PLANNING TOOLS

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.

Model Lesson- *Weather*
- Exploring Weather
- Exploring Weather with Tools
- Tracking Weather in Different Locations

Suggested Pacing: (4 days)
TEKS: 3.8A

Model Lesson- *Our Sun*
- Our Amazing Sun
- Our Sun's Energy

Suggested Pacing: (2 days)
Optional
- Our Sun's Affects

TEKS: 3.8B

Model Lesson- *The Water Cycle*
- Water Everywhere
- Terrarium Water
- Evaporation
- Condensation
- Precipitation/Saturation

Suggested Pacing (5 days)
TEKS: 3.8B

Model Lesson- *Sun, Earth and Moon*
- Sun, Earth and Moon Models
- Earth's Rotation

• Earth's Revolution Suggested Pacing (7 days) TEKS: 3.8C
Model Lesson- *Our Solar System* • Where Are We? Our Place in Space • Closer Look: Our Solar System • Assessing Weather and Space Suggested Pacing (7 days) TEKS: 3.8D