

Space: The Final Frontier

Curriculum Map

Unit Title: Space the Final Frontier

Grade Level: Second

Contest Area: Science

Designed by: TMS Second Grade Team

Duration of Unit: 4-6 weeks

Unit Overview:

Georgia Performance

S2E1. Students will understand that stars have different sizes, brightness, and patterns.

- a. Describe the physical attributes of stars—size, brightness, and patterns.

S2E2. Students will investigate the position of sun and moon to show patterns throughout the year.

- a. Investigate the position of the sun in relation to a fixed object on earth at various times of the day.
- b. Determine how the shadows change through the day by making a shadow stick or using a sundial.
- c. Relate the length of the day and night to the change in seasons (for example: Days are longer than the night in the summer.).
- d. Use observations and charts to record the shape of the moon for a period of time.

S2E3. Students will observe and record changes in their surroundings and infer the causes of the changes.

- a. Recognize effects that occur in a specific area caused by weather, plants, animals, and/or people.

Unit Essential Questions:

Star Classification and Traits

-What is a star?

- How do stars compare in terms of brightness, color, size, and pattern?

-What are the largest stars called?

- What are the smallest stars called?
- What color are the hottest stars called/the coolest?
- What is the life cycle of stars?
- What is a star called after it explodes?
- What is a constellation?

Sun Patterns

- Why does the sun appear to move across the sky from east to west?
- How are shadows on Earth affect by the Sun?
- How does the Sun's changing positions change shadows?
- How does a sundial work?

Day and Night

- What happens to the length of the day and night as the seasons change?
- What makes day and night?
- Why does the Sun shine during the day, but not at night?

Seasons

- What happens to the length of the day and night as the seasons change?
- What makes seasons?

The Moon

- Why does the moon appear to move across the sky?

-How does the moon get its light?

-What causes the moon to appear to change shapes each month?

-What are the phases of the moon on its monthly cycle?

Recommended Field Experiences

Tellus Science Museum

Fernbank Science Center

High Touch, High Tech

Elachee Nature Center

Space: The Final Frontier

Weekly Plans


Week	Theme	Materials	Lesson Description and Learning Targets
Week 1	Galaxies and Beyond: An Introduction to Space	-Suitcase Printable - <i>There's No Place Like Space</i> by Tish Rabe - <i>Older than Stars</i> by Karen C. Fox - <i>Galaxies, Galaxies</i> by Gail Gibbons - <i>The Milky Way and Other Galaxies</i> by Dana Meachen Rau _Milky Way Candy Bars (optional) -Spiral Galaxy Poster -Elliptical Galaxy Poster -Irregular Galaxy Poster -Galaxy Directions -Paper Plate -Glitter -Purple, Blue, and Yellow Paint -Milky Way Acrostic Poem Template	Learning Targets: *I can tell about galaxies. *I can identify the galaxy that I live in. *I can name three types of galaxies Lesson Descriptions: -As a hook, give each student a copy a suitcase. Ask the students to close their eyes and imagine if they could travel to space. Ask them to think about the things that they will pack. Allow students to write or draw items that As a hook, give each student a copy a suitcase. Ask the students to close their eyes and imagine if they could travel to space. Ask them to think about the things that they will pack. Allow students to write or draw items that they will take with them. -Read <i>There's No Place Like Space</i> -As a unit introduction, read <i>Older than Stars</i> by Karen C. Fox -Introduce this unit by giving each student a Milky Way. Ask the students if they know what a Milky Way is? Explain to the students that the Milky is the galaxy in which we live. -Read <i>The Milky Way and Other Galaxies</i> by Dana Meachen Rau. -Show the students the galaxy poster. Tell them that a galaxy is a huge collection of stars, gas, and dust. -Read <i>Galaxies, Galaxies</i> , by Gail Gibbons.

			<ul style="list-style-type: none"> -Show the students the types of galaxies poster. -Explain to the students that there are three types of galaxies which are: spiral, irregular, and elliptical. -Allow the students to create their own galaxies. -Allow the students to create an Acrostic Poem using the word MILKY WAY. Allow the students to share their acrostic poems.
<p>Week 2</p>	<p>Starry Nights: Taking a Closer Look at Stars</p>	<ul style="list-style-type: none"> -<i>Stargazer</i> by Gail Gibbons -<i>Seeing Stars</i> Video -<i>Why Do Stars Twinkle</i> Video -<i>Giant Stars</i> Video -Binary Star Video -Star Classification Anchor chart -Star Classification Research -The Color of the Star Lyrics -<i>Stars</i> by Seymour Simon -Star Classification Anchor Chart -Life Cycle of a Star Graphic Organizer 	<p>Learning Targets:</p> <ul style="list-style-type: none"> *I can classify stars according to various colors, shapes, and sizes. *I can describe the life cycle of a star. <p>Lesson Descriptions:</p> <ul style="list-style-type: none"> - Read <i>Stargazer</i> by Gail Gibbons. -<i>Seeing Stars</i> video: http://www.neok12.com/php/watch.php?v=zX42004f656f5176527a6f6b&t=Stars -<i>Why Do Stars Twinkle</i> http://www.videojug.com/film/why-do-the-stars-twinkle -<i>Giant Stars</i> video: http://www.watchknowlearn.org/Video.aspx?VideoID=29501&CategoryID=1165 -<i>Binary Stars</i> video: http://www.watchknowlearn.org/Video.aspx?VideoID=32983&CategoryID=1165 <ul style="list-style-type: none"> -Show the students the anchor chart for stars classifications. -Have the students to complete the star classification anchor chart.

			<ul style="list-style-type: none"> -Star Classification Research -The students will create a Star Classification Mobile -Teach the students The Color of the Star song. -Read <i>Stars</i> by Seymour Simon -Show the students the graphic organizer for the life cycle of a star. -Color of the Stars Song Link: http://www.kidsknowit.com/educational-songs/play-educational-song.php?song=The%20Color%20of%20A%20Star -Life Cycle of a Star Project
Week 3	Constellation: Exploring Wondrous Star Patterns	<ul style="list-style-type: none"> -Constellation Schema Activity -Constellation Pictures for Picture Walk -<i>The Storytelling Star</i> by James Riordan -Constellation Posters -The Universe: Constellation Video -What is a Constellation Video -Constellation PowerPoint -Constellation Videos -Marshmallows -Toothpicks -Constellation in a Can Directions -Empty Pringles canister 	<p>Learning Targets:</p> <ul style="list-style-type: none"> *I can describe a constellation. *I can identify several constellations. <p>Lesson Descriptions:</p> <ul style="list-style-type: none"> -Constellation schema activity. -Constellation picture walk. -Read <i>The Storytelling Star</i> by James Riordan -Show the students the constellation poster and tell them that a constellation is a group of stars. -Show the students the constellation PowerPoint. -<i>The Universe: Our Constellation</i> video: http://www.watchknowlearn.org/Video.aspx?VideoID=25019&CategoryID=407 -<i>What is a Constellation?</i> video: http://www.videojug.com/film/what-is-a-constellation

			<p>-The students will create Marshmallows Constellations The students will create a Constellation in a Can</p>
Week 4	<p>Shadows: Self Reflection Deeper into the Sun</p>	<p><i>The Sun</i> by Seymour Simon -<i>What Makes a Shadow?</i> by Clyde Robert Bulla -<i>What are Shadow?</i> Video -"Shadow Play" by Elizabeth Schafer (Shadow Night by Kay Chora)</p> <p>-"Ground Hog Day" by Lillian Moore from <i>The Random House Book of Poetry for Children</i> -<i>Nothing Sticks Like a Shadow</i> by Ann Tompert - "<i>Shadow Race</i>" (from <i>A Light in the Attic</i> by Shel Silverstein) -flashlights</p>	<p>Learning Targets: * I can understand what makes shadows</p> <p>Lesson Descriptions: -Introduce KWL on Shadows -Take students on a shadow walk (sunny day) -Read <i>What Makes a Shadow?</i> by Clyde Robert Bulla -Compare prior knowledge from KWL with information from book -<i>What are Shadows?</i> video: http://www.watchknowlearn.org/Video.aspx?VideoID=18789&CategoryID=534</p> <p>-Show pictures and identify light source, object and its shadow -Allow students to draw their own shadow pictures and label the light source, object, and its shadow -Read aloud Shadow Play by Elizabeth Schafer -Read the poem Shadow Show -Ask students can shadows change? -Complete shadow experiment in groups of threes with : one flashlight, one recorder , and one student to be the model. - Read" Shadow Race" (from <i>A Light in the Attic</i> by Shel Silverstein) -Ask students who will win the shadow race -Perform shadow race and test hypothesis on a sunny day -Read Poem my Shadow by Robert Louis</p>

			<p>Stevenson</p> <ul style="list-style-type: none"> -Have students use all their observations and findings from shadows lesson to create a poem about shadow. -Use synonyms to make poem come to life
Week 5	Sun's Movement and Seasons	<p>Required Materials:</p> <ul style="list-style-type: none"> -Science Journal (blank paper) -Large stone or a stick to mark your sun tracking location -Clipboards/ or something hard to write on outside -Chart paper/ easel for teacher (instead of picture) <p><i>The Sun Rises</i> by Brenda Walpole What makes day and night by Frank Branley The reasons for the season by Gail Gibbons Why do the seasons change by Melissa Stewart</p> <p>Suggested Materials <i>*optional</i></p> <ul style="list-style-type: none"> -Digital camera/ cellphone/ Ipad -Use panorama feature on camera/ ipad/ iphone to take a picture of the southern sky by 	<p>Learning Targets: *I can understand how the Sun moves across the sky</p> <p>Lesson Descriptions: How does the sun move in the sky?</p> <p>*Preparation: find a spot/ clear area where you and your class can track the sun (southern sky). You should check the weather forecast for a clear day</p> <p>-</p> <ul style="list-style-type: none"> -Engage students with a scenario, "Yesterday, a kindergartner named _____ asked me did the sun move everyday? The kindergartner said the sun is in one position when he rides to school in the morning, and the sun is in another position when he leaves school. Where does the sun go each night? Can you help?" -Have students to draw and write in their journal how they perceive the sun moves in the sky. -Take students outside to sun tracking location -Without mentioning the direction South, you need to make everyone face South -You might want to talk about why it is important that everyone face the same direction (without talking about South) when you are all observing the same object. (same procedure to receive

		<p>the school -globe -flashlight orbiter <i>Sun up, Sun down</i> by Gail Gibbons</p> <p><i>The Sun Rises</i> by Brenda Walpole <i>What Makes Day and Night</i> by Frank Branley <i>The Reasons for the Reason</i> by Gail Gibbons <i>Why do the Seasons Change?</i> by Melissa Stewart <i>Why Does the Earth Have Different Seasons</i> video. <i>Sunshine makes the seasons</i> by Frank Branley</p>	<p>same results) -Have students to draw the scene of their sun tracking (buildings, trees, landscape, etc)</p>  <p>-Important: Students should never look directly at the sun! Students can hold their hands out to block the sun, and look below to see exactly where the sun is located in the sky -Students should label their sun with the hour -Teacher should model these steps on the chart paper w/ easel or on the panoramic photo -Have students to predict if the sun will move in the sky, and how it will move? What will happen in one hour? Anything? What will our view look like? Will we need to draw a different picture of the school yard? -Student should revisit their sun tracking spots in one hour increments throughout the day Maybe here is where teams might help keep records and draw the Sun on the easel view. How did their predictions turn out? Does anyone have a theory about the movement? Where is the Sun going? What happened to their shadows? -Read <i>Sun up , Sun Down</i> by Gail Gibbons -Read <i>Why do the Seasons Change</i> -Allow students to share their learnings on why the seasons change?</p>
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		<p>-Why Does Earth Have Different Season? video: http://www.watchknowlearn.org/Video.aspx?VideoID=4752</p> <p>-Have students to draw a tree in all four season and write a story about the cause of the seasons.</p> <p>-Read <i>The Reason for the Seasons</i> by Gail Gibbons</p> <p>-Hold a class discussions about the characteristics of each season.</p> <p>-Have students to discuss and list things to do, see, feel, hear, wear</p> <p>-Break students into groups and have them to present about each season (illustrate the season, incorporating facts they learned from discussion and books .)</p> <p>-Display the posters</p> <p>-Extension: have each student complete the following sentence (My favorite season is _____ because _____) after everyone is complete, collect the work and place in a class book.</p> <p>-Read <i>Why do Seasons Change</i> by Melissa Stewart</p> <p>-Perform season demonstration (Season demonstration can be performed with the electric orbiter or following directions below.)</p> <p>-Using a globe and flashlight, show the class how the earth turns on its axis by spinning the globe</p> <p>-Explain that the axis is tilted and the tilt never changes.</p> <p>-Have student to tilt their bodies forward to</p>
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			<p>demonstrate the earth's tilt</p> <ul style="list-style-type: none"> -Request the best tilter to be your volunteer to hold the globe and slowly spin it while circling the lamp/ flashlight/ -Have the student to stop at different places during the globe's orbit. -After each stop, ask students which part of the earth would be warmer or cooler. -Ask more questions like, is it summer for the people in the Northern Hemisphere? or Is the sun brighter for the people in the Southern Hemisphere? <p>Students should understand that the Earth's tilt determines the season. When the Northern hemisphere is tilted towards the sun, we are in Summer, when we are tilted away from the sun, we are in Winter. These are called the Summer and Winter Solstice.</p> <ul style="list-style-type: none"> -Spring and Fall are equinox points, when we have equal day and nights. <p>Season extension</p> <ul style="list-style-type: none"> - Have students to use creative writing to express their season knowledge. -Introduce figurative language like: spring fever, dog days of summer, winter blues, etc. -Brainstorm the meanings of these figurative expressions. -Challenge students to create their own figurative language for seasons like falling into autumn. -Have students to come with a cure for spring fever or the winter blues, complete with illustrations. -Display cures on ceiling or bulletin board and title it "Seasonal RX"
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<p>Week 6</p>	<p>The Cool Moon: A Closer Look at the Moon</p>	<p>-The KWL Chart -The Moon Video -Moon Calendar -The Moon Book by Gail Gibbons -Phases of the Moon video -Moon by Steve Tomeck -The Moon by Melanie Chrismer -Papa, Please get the Moon for Me By Eric Carle -Rise the Moon by Eileen Spinell -Moonstick by Eve Bunting http://www.nasa.gov/mission_pages/LRO/news/2013-moon-phases.html#.UzSeyq1dXio -Moon in my Room -Phases of the Moon Song</p>	<p>Learning Targets: *I can tell why the moon lights up. *I can describe different phases of the moon. *I can track the different phases of the moon.</p> <p>Lesson Description: -To assess prior knowledge, give the students a Moon KWL chart. Discuss the K and W. -The Moon video: http://www.gamequarium.org/cgi-bin/search/info.cgi?id=4652 -Explain the moon calendar to the students. They will be tracking the moon phases for one month. -Engage students with a read aloud of Rise the Moon by Eileen Spinelli (use night animal sounds CD while reading book aloud) -After reading the book turn back pages and model questioning: Does the Moon really pull the ocean? Where does the moon light come from? Is the moon only visible at night? I wonder what makes the moon look different sometimes?</p> <p>-Introduce moon Journal to students, tell them they will be observing the moon each night. -http://www.moonconnection.com/moon_phases_calendar.phtml</p> <ul style="list-style-type: none"> • Have students to survey people in different classes "What causes the Moon to look different each night" <p>-Use moon model to show that half of the moon is always lit by the sun -Perform moon modeling in darkened room with</p>
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			<p>foam balls and light</p> <ul style="list-style-type: none">-Read the <i>Moon Book</i> by Gail Gibbons to explain moon phases.-<i>Phases of the Moon</i> video: http://www.watchknowlearn.org/Video.aspx?VideoID=5285-Introduce and read <i>Papa Please Get the Moon for Me</i> by Eric Carle-Reread <i>Papa Please Get the Moon for Me</i> and have students to listen for anything that is scientifically incorrect-Let the students experiment with the Moon on my Room to explore various moon phases.-<i>Phases of the Moon</i> Rap: http://www.youtube.com/watch?v=AQRNzepe4wI
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