

5-EES1-1-Earth's Place in the Universe

- 5-ESS1-1** Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from the Earth.
[Assessment Boundary: Assessment is limited to relative distances, not sizes, of stars. Assessment does not include other factors that affect apparent brightness (such as stellar masses, age, stage).]
- 5-ESS1-2** Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. *[Clarification Statement: Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months.]*

<u>Literacy or Informative Text</u>	<u>Lab Investigations</u>	<u>Assessments</u>
<p><u>Scott Foresman text</u> pages: C118-123</p> <p><u>The Penguin: Interactive Notebook</u></p> <p><u>Science and Literacy:</u> <i>What is a Light Year</i> <i>Measures of Science</i> <i>Stars</i> <i>All about Stars</i> <i>Fun Facts about Stars</i></p> <p><i>Sun and Stars</i> <i>Informational Text and Lapbook</i> <i>Constellations and Seasons</i> <i>Constellation WORKbooks</i> <i>Zodiac</i> <i>Pictures in the Stars,</i> <i>Legends in the Skies</i></p> <p><u>Delta Readers:</u> <i>Our Solar System and Beyond</i> <i>Earth, Moon, and Sun System</i></p>	<p>Interactive Notebook: Tables of Distances</p> <p>Hallway demonstration of distances</p> <p>Flashlight Shadows Shadows Tracing- mimic sun to earth shadows</p> <p>Sizing Up Shadows Light and Shadow</p> <p>Research- Investigate the difference between stars of different seasons. Each student pick a seasonal star to research</p> <ul style="list-style-type: none"> • Location of star • Distance • Color • Size • history/naming • Classification of star <p>Graph distances of stars Sizing Up the Stars Star brightness Detectors</p> <p>Research famous sky watchers</p> <p>Shadow Investigations- Make a flipbook</p> <p>Planetarium visit</p>	<p>Warm Up Activities</p> <p>Investigations</p> <p>Scientific Method Documentation</p> <p>Graphic Organizers</p> <p>Lab Matrixes/written observations</p> <p>Written Connection Summary</p> <p>Foldables/Lab Interactive Notebooks</p> <p>Performance Indicator Assessments</p> <p>Teacher Observations/Student Participation</p>

Technology:

Size and direction of shadows | Light | Physics

<https://www.youtube.com/watch?v=yjLIE1aoXGY>

Following the Sun: Crash Course Kids #8.2

www.youtube.com/watch?v=1SN1B0pLZAs

Star Distance and Brightness - YouTube

<https://www.opened.com/video/star-distance-and-brightness-youtube/1031273>

How Do We Measure the Distance to Stars? - Instant Egghead #46 - YouTube

<https://www.youtube.com/embed/vyiauRjJBNQ>

Stargazing Basics 2: Understanding magnitudes - YouTube

https://www.youtube.com/embed/9P8Veb_AIJ0

Why Do Stars in the Night Sky Change With the Seasons? : Planets

<https://www.youtube.com/watch?v=tLPNawTZOSQ>

Constellations: The Changing Night Sky - Windows to the Universe

https://www.windows2universe.org/the_universe/Constellations/constellations5.html

Why do different stars appear with seasons? (Beginner) - Curious ...

curious.astro.cornell.edu/.../stargazing/.../734-why-do-different-stars-appear-with-seas...

Why do the stars change with the seasons? - Mystery Science

<https://mysteryscience.com/astronomy/mystery-3>

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Observable features of the student performance by the end of the grade

5-ESS1-1:

1. Supported Claims

A. Students identify a given claim to be supported about a given phenomenon. The claim includes the idea that the apparent brightness of the sun and stars is due to their relative distances from Earth.

2. Identifying Scientific Evidence

A. Students describe* the evidence, data, and/or models that support the claim, including:

- i. The sun and other stars are natural bodies in the sky that give off their own light.
- ii. The apparent brightness of a variety of stars, including the sun.
- iii. A luminous object close to a person appears much brighter and larger than a similar object that is very far away from a person (e.g., nearby streetlights appear bigger and brighter than distant streetlights).
- iv. The relative distance of the sun and stars from Earth (e.g., although the sun and other stars are all far from the Earth, the stars are very much farther away; the sun is much closer to Earth than other stars).

3. Evaluating and Critiquing Evidence

- A. Students evaluate the evidence to determine whether it is relevant to supporting the claim, and sufficient to describe* the relationship between apparent size and apparent brightness of the sun and other stars and their relative distances from Earth.
- B. Students determine whether additional evidence is needed to support the claim.

4. Reasoning and Synthesis

A. Students use reasoning to connect the relevant and appropriate evidence to the claim with argumentation. Students describe* a chain of reasoning that includes

- i. Because stars are defined as natural bodies that give off their own light, the sun is a star.
- ii. The sun is many times larger than Earth but appears small because it is very far away.
- iii. Even though the sun is very far from Earth, it is much closer than other stars.
- iv. Because the sun is closer to Earth than any other star, it appears much larger and brighter than any other star in the sky.
- v. Because objects appear smaller and dimmer the farther they are from the viewer, other stars, although immensely large compared to the Earth, seem much smaller and dimmer because they are so far away.
- vi. Although stars are immensely large compared to Earth, they appear small and dim because they are so far away.
- vii. Similar stars vary in apparent brightness, indicating that they vary in distance from Earth.

5-ESS1-2:

1 Organizing Data

A. Using graphical displays (e.g., bar graphs, pictographs), students organize data pertaining to daily and seasonal changes caused by the Earth's rotation and orbit around the sun. Students organize data that include

- i. The length and direction of shadows observed several times during one day.
- ii. The duration of daylight throughout the year, as determined by sunrise and sunset
- iii. Presence or absence of selected stars and/or groups of stars that are visible in the night sky at different times of the year.

2. Identifying relationships

A. Students use the organized data to find and describe* relationships within the datasets, including:

- i. The apparent motion of the sun from east to west results in patterns of changes in length and direction of shadows throughout a day as Earth rotates on its axis.
- ii. The length of the day gradually changes throughout the year as Earth orbits the sun, with longer days in the summer and shorter days in the winter.
- iii. Some stars and/or groups of stars (i.e., constellations) can be seen in the sky all year, while others appear only at certain times of the year.

B. Students use the organized data to find and describe* relationships among the seasons

- i. Similarities and differences in the timing of observable changes in shadows, daylight, and the appearance of stars show that events occur at different rates (e.g., Earth rotates on its axis once a day, while its orbit around the sun takes a full year).

5-ESS2-1-Earth's Systems

5-ESS2-1. Develop a model using an example to describe ways the **geosphere, biosphere, hydrosphere, and/or atmosphere interact.** [Clarification Statement: Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.]

Literacy or Informative Text	Lab Investigations	Assessments
<p>Scott Foresman text pages: C8-C11</p>	<p>Make Our Own Greenhouse</p>	<p>Warm Up Activities</p> <p>Investigations</p>
<p>The Penguin:Interactive Notebook on 4 Spheres</p>	<p>Diagram and writing about the Interaction of all the spheres</p>	<p>Scientific Method Documentation</p> <p>Graphic Organizers</p>
<p>Science and Literacy: The Four Spheres of Earth Break It Down Erosion</p>	<p>Weathering of Chalk Experiment (text)</p> <p>Burning Issues</p>	<p>Lab Matrixes/written observations</p> <p>Written Connection Summary</p>
<p>Delta Reader: Earth, Moon, and Sun System Soils Weathering and Erosion</p>	<p>Dangerous Atmosphere</p>	<p>Foldables/Lab Interactive Notebooks</p> <p>Performance Indicator Assessments</p>
		<p>Teacher Observations/Student Participation</p>

Technology:

Burning Issues

<http://www.earthsciweek.org/classroom-activities/burning-issues>

Dangerous Atmosphere

<http://www.earthsciweek.org/classroom-activities/dangerous-atmosphere>

Four Spheres Part 1 (Geo and Bio): Crash Course Kids #6.1

www.youtube.com/watch?v=VMxjzWHbyFM

Four Spheres Part 2 (Hydro and Atmo): Crash Course Kids

#6.2www.youtube.com/watch?v=UXh_7wbnS3A

Big Idea 3: Earth's Systems Interact

www.youtube.com/watch?v=BnpF0ndXk-8&list=PLttp9mvgDFqX_RckvcK2Bw9PDPe4p2

EgQ

Weathering and Erosion: Crash Course Kids #10.2

www.youtube.com/watch?v=R-lak3Wvh9c

Observable features of the student performance by the end of the grade:

1. Components of the model

A. Students develop a model, using a specific given example of a phenomenon, to describe* ways that the geosphere, biosphere, hydrosphere, and/or atmosphere interact. In their model, students identify the relevant components of their example, including features of two of the following systems that are relevant for the given example:

- i. Geosphere (i.e., solid and molten rock, soil, sediment, continents, mountains)
- ii. Hydrosphere (i.e., water and ice in the form of rivers, lakes, glaciers).
- iii. Atmosphere (i.e., wind, oxygen).
- iv. Biosphere (i.e., plants, animals [including humans]).

2. Relationships

A. Students identify and describe* relationships (interactions) within and between the parts of the Earth systems identified in the model that are relevant to the example (e.g., the atmosphere and the hydrosphere interact by exchanging water through evaporation and precipitation; the hydrosphere and atmosphere interact through air temperature changes, which lead to the formation or melting of ice).

3. Connections

A Students use the model to describe* a variety of ways in which the parts of two major Earth systems in the specific given example interact to affect the Earth's surface materials and processes in that context. Students use the model to describe* how parts of an individual Earth system:

- i. Work together to affect the functioning of that Earth system.
- ii. Contribute to the functioning of the other relevant Earth system.

5ESS2-2- Earth's Systems

5-ESS2-2. Describe and graph the amounts of saltwater and freshwater in various reservoirs to provide evidence about the distribution of water on Earth. [Assessment Boundary: Assessment is limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere.]

Literacy or Informative Text	Lab Investigations	Assessments
<p>Scott Foresman text pages: C48-50</p> <p>The Penguin: Distribution of Water on Earth</p> <p>Science and Literacy: Water, Water Everywhere Where Does Water Come From</p> <p>Delta Reader</p>	<p>Make a poster of a pie graph for percentage of saltwater and freshwater on earth.</p> <p>Pinterest- tissue paper mosaic of percentage of water on earth</p> <p>Deep Sea Drilling</p> <p>Hydrologic Cycle</p> <p>Groundwater Movement</p>	<p>Warm Up Activities</p> <p>Investigations</p> <p>Scientific Method Documentation</p> <p>Graphic Organizers</p> <p>Lab Matrixes/written observations</p> <p>Written Connection Summary</p> <p>Foldables/Lab Interactive Notebooks</p> <p>Performance Indicator Assessments</p> <p>Teacher Observations/Student Participation</p>

Technology:

Deep-Sea Drilling

<http://www.earthsciweek.org/classroom-activities/deep-sea-drilling>

Earth's Hydrologic Cycle

<http://www.earthsciweek.org/classroom-activities/earths-hydrologic-cycle>

Groundwater Movement

<http://www.earthsciweek.org/classroom-activities/groundwater-movement>

Observable features of the student performance by the end of the grade:

1. Representation

A. Students graph the given data (using standard units) about the amount of salt water and the amount of fresh water in each of the following reservoirs, as well as in all the reservoirs combined, to address a scientific question:

- i. Oceans.
- ii. Lakes.
- iii. Rivers.
- iv. Glaciers.
- v. Groundwater.
- vi. Polar ice caps.

2. Mathematical/computational analysis

A. Students use the graphs of the relative amounts of total salt water and total fresh water in each of the reservoirs to describe* that:

- i. The majority of water on Earth is found in the oceans.
- ii. Most of the Earth's freshwater is stored in glaciers or underground.
- iii. A small fraction of freshwater is found in lakes, rivers, wetlands, and the atmosphere.

5-ESS3-1: Earth and Human Activity

5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.

Literacy or Informative Text	Lab Investigations	Assessments
<p>Scott Foresman text pages:C42-C53 C54-55 C56-C67 C67-68</p> <p>The Penguin: Human Impact Agricultural Run Off</p> <p>Science and Literacy: Human Impact on Earth Earth’s resources Negative Environmental Impact Positive environmental impact Solving Environmental Problems Fossil Fuels</p> <p>Delta Reader</p>	<p>A Paste with Taste</p> <p>Cookie Mining</p> <p>Burning Issues</p> <p>Investigating Water Pollution Text lab) C54-55</p> <p>Investigating Air Pollution (text lab)C67-68</p> <p>Earth Day Mascot</p> <p>Human Impact Task Cards</p> <p>Human Impact-Rd <u>The Boy Who Harnessed the Wind and Energy Island</u> do problem and solution foldable</p> <p>Agricultural RunOff Fact Sheet (Penguin)</p>	<p>Warm Up Activities</p> <p>Investigations</p> <p>Scientific Method Documentation</p> <p>Graphic Organizers</p> <p>Lab Matrixes/written observations</p> <p>Written Connection Summary</p> <p>Foldables/Lab Interactive Notebooks</p> <p>Performance Indicator Assessments</p> <p>Teacher Observations/Student Participation</p>

Technology:

The Short Story: "Samsø The Energy Island"

[/www.youtube.com/watch?v=pXdxYTcOvwc](http://www.youtube.com/watch?v=pXdxYTcOvwc)

A Paste with a Taste

<http://www.earthshhttp://www.earthsciweek.org/classroom-activities/>

Cookie Mining

[cookie-miningciweek.org/classroom-activities/a-paste-with-taste](http://www.earthsciweek.org/classroom-activities/a-paste-with-taste)

Burning Issues

<http://www.earthsciweek.org/classroom-activities/burning-issues>

Observable Features of the Student Performance by the end of the grade

1. Supported Claims

- i. How a given human activity (e.g., in agriculture, industry, everyday life) affects the Earth's resources and environments.
- ii. How a given community uses scientific ideas to protect a given natural resource and the environment in which the resource is found.

2. Evaluating information

A. Students combine information from two or more sources to provide and describe* evidence about:

- i. The positive and negative effects on the environment as a result of human activities.
- ii. How individual communities can use scientific ideas and a scientific understanding of interactions between components of environmental systems to protect a natural resource and the environment in which the resource is found.

Engineering Design

Students who demonstrate understanding can:

3-5-ETS1.1- Define a simple design problem reflecting a need or a want that includes specified criteria

For success and constraints on materials, time, or cost.

3-5-ETS1.2- Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ETS1.3- Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Physical Sciences