

Sun Misconceptions

Student Objectives

The student:

- understands why some common phrases about the Sun are incorrect
- can describe how the Earth's rotation affects how we perceive the Sun's path and the length of shadows
- can describe how the Earth's atmosphere affects the color that the Sun appears to be.

Key Words:

rotation

Time:

1 class period

Materials

- Science Journal

Procedure

1. Divide students into groups of 3 - 4 students per group.
2. Explain to the students that they will be brainstorming within their groups the reasons that the statements in their Science Journal are incorrect, and then they will be sharing their answers with the class.
3. After the groups have had time to write down their answers, lead a classroom discussion of their answers.

Answer Key

1. The Sun moves across the sky from east to west.
Answer: The Sun appears to move across our sky from the east to west because of the Earth's counterclockwise rotation.
2. The Sun comes up in the east and goes down in the west.
Answer: This apparent motion is also due to our counterclockwise rotation. As our Earth turns and the part of the Earth we are on rotates towards the Sun, we see it appear to rise above the horizon.
3. The Sun dips below the horizon just below dark.
Answer: This apparent motion is also due to our counterclockwise rotation. When the part of the Earth we are on rotates away from the Sun, we see it appear to "set" in the west. Dusk is caused because the upper atmosphere is still receiving light after the ground level is not.
4. The Sun moved behind a cloud.
Answer: The clouds move across the sky, moving between where we are on the Earth and

- the Sun.
5. The Sun isn't out on stormy days.
Answer: The Sun is still in the sky in the same place, the clouds are just so thick that its light doesn't get through them.
 6. A shadow changes as the Sun moves.
Answer: The length of the shadow does change (getting shorter when the Sun is more overhead), however, it's our Earth turning that causes the apparent change in position of the Sun, not the Sun moving.
 7. The Sun stays up in the sky longer in the summer than in the winter.
Answer: The amount of daylight hours is longer in the summer than the winter. This is caused by the tilt of our Earth.
 8. The Sun moves in an arc across the sky.
Answer: The Sun's path appears to be an arc because Earth is a sphere. As Earth rotates, from our perspective it appears that the Sun moves in an arc-shaped path which varies in shape depending on the latitude of the observer.
 9. When the Sun goes down, the moon comes up.
Answer: The moon's and the Sun's orbit are independent of each other. The moon is sometimes in the part of the sky that is visible to us during the day; however, when the sunlight is bright, it is either not visible, or just faintly visible.
 10. The Sun changes color.
Answer: Since the light from the Sun travels through our atmosphere, it's our atmosphere (moisture, dust, etc) that causes the change in colors.

Key Words & Definitions

- **rotation** – the act of spinning on an axis

Related Research

1. Mankind historically has had many stories/folklore about the Sun and our relationship to it. Research one or more of these stories as a group or individual project. The stories may be acted out, assembled into a visual arts collection, or presented in a PowerPoint presentation.
2. Research one or more scientists who studied the Sun. Examples include: Thales, Aristarchus, Copernicus, Ptolemy, Galileo, von Fraunhofer, Lockyer, Hale, and Gamow.

Related Reading

- *A Look at the Sun* by Ray Spangenburg & Kit Moser (Franklin Watts, 2002)
This detailed yet accessible book unravels the scientific wonders of the Sun—including nuclear fusion, fiery solar prominences shooting into space and the sprinkling of dark spots on its surface.
- *The Sun* by Steele Hill (Harry N. Abrams, 2006)
This book includes dramatic images from photographers, observatories and satellites. Through these images and a clear, precise text, the book explores the intricate dance

between the Sun and Earth, examining this relationship in both mythical and scientific terms.

Internet Sites

<http://solar-center.stanford.edu/>

FAQs about the Sun, solar physics, solar folklore, and astronomy.

<http://eo.ucar.edu/kids/sky/sun1.htm>

National Center for Atmospheric Research and the University Corporation for Atmospheric Research. Student site about the Sun includes facts, information about the greenhouse effect, and directions to make an Aurora flip book.

<https://www.windows2universe.org/?page=/sun/sun.html>

University Corporation for Atmospheric Research (UCAR) site for students on the Sun. Includes Sun facts as well as Sun myths, activities and games.

http://www.thesis.lebedev.ru/en/sun_pictures.html

Daily images of the Sun, including the Sun's chromosphere, photosphere, magnetic field, transition region, corona and the solar wind obtained from various instruments on the SDO and SOHO spacecrafts.

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Florida NGSS Standards & Related Subject Common Core

			.1	.2	.3	.4	.5	.6	.7	.8	.9	.10	.11	.12
Grade 8														
Practice of Science	# 1	SC.8.N.2	X											
Language Arts Standards	Sixth Grade: LAFS.6.SL.1.1 Seventh Grade: LAFS.7.SL.1.1 Eighth Grade: LAFS.8.SL.1.1													

Sixth Grade Benchmarks

Language Arts–Standards for Speaking & Listening

- LAFS.6.SL.1.1 - Engage effectively in a range of collaborative discussions with diverse partners on grade 6 topics, texts, and issues, building on others’ ideas and expressing their own clearly.

Seventh Grade Benchmarks

Language Arts–Standards for Speaking & Listening

- LAFS.7.SL.1.1 - Engage effectively in a range of collaborative discussions with diverse partners on grade 7 topics, texts, and issues, building on others’ ideas and expressing their own clearly.

Eighth Grade Benchmarks

Science–Big Idea 2: The Characteristics of Scientific Knowledge

- SC.8.N.2.1 - Distinguish between scientific and pseudoscientific ideas.

Language Arts–Standards for Speaking & Listening

- LAFS.8.SL.1.1 - Engage effectively in a range of collaborative discussions with diverse partners on grade 8 topics, texts, and issues, building on others; ideas and expressing their own clearly.

National Next Generation Science Standards - Sixth to Eighth Grade Standards

Science - Earth’s Place in the Universe

- MS-ESS1-1 - Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.

Note: Related Common Core Language Arts Standards are listed in the Florida section above.

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