

Atmosphere, 5E Lesson Plan

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TOPIC

Earth seasons & seasons on other planets

TITLE

“The Reason for the Seasons”

GRADE LEVEL

7th- 9th Grade

NGSS AND COMMON CORE STANDARDS

MS-ESS1.B.2 (Middle School Earth and Space Sciences): This model of the solar system can explain eclipses of the sun and the moon. Earth’s spin axis is fixed in direction over the short-term but tilted relative to its orbit around the sun. The seasons are a result of that tilt and are caused by the differential intensity of sunlight on different areas of Earth across the year.

SET UP: PLACE AND TIME

This short formative lesson will take place in the classroom. 2 class periods (72 minutes each) are expected to fully complete the lesson.

BACKGROUND & JUSTIFICATION

Students often arrive in my classroom with the common misconception that the distance from the sun plays a role in the Earth’s season. I really like the website presented to us in our last live class and upon further investigation have found that same site has a wealth of information and activities to learn more about why the Earth has seasons. Here in Maine, my students get to experience all 4 seasons and should be able to make the connection easily.

OBJECTIVES

- Recognize that Earth's spin axis is fixed in direction over the short-term but tilted relative to its orbit around the sun.
- Cite evidence that the seasons are a result of that tilt and are caused by the differential intensity of sunlight on different areas of Earth across the year.
- Compare and contrast Earth season's to seasons on other planets.

MATERIALS

- classroom projector
- iPads or other internet connected device
- student discussion questions & rubric

ENGAGE

Day 1:

Ask students why they think the Earth has seasons. Record ideas on the board. Entertain as many possibilities as they are willing to offer.

Show this video: <https://www.youtube.com/watch?v=b25g4nZTHvM> and then discuss misconceptions.

EXPLORE

Day 1 continued:

Launch animation: https://nj.pbslearningmedia.org/resource/npls13.sci.ess.seasons/why-seasons/en/#.Wx6X4S_MyT9

Show students how to access information and explore the four example cities together.

Split students into 5 groups and assign one discussion question per group (see Evaluate).

EXPLAIN

End of Day 1:

Student groups will report their findings back to the whole class. Allow time for discussion and questions from other groups.

ELABORATE/EXTEND

Day 2:

Student groups research and explain seasons on other planets. Allow half the class period for each group to create 2-3 slides explaining their findings. Students will then present their findings to the whole class. Again, allow time for discussion/ questions.

EVALUATE

Student Discussion Questions

*from PBS Learning Media

- 1) Explain how the motion of Earth causes night and day.
- 2) How does the position of the Sun in the sky affect the intensity of sunlight striking Earth's surface?
- 3) How would you explain why North America is warmer in June and colder in December?
- 4) Why is it winter in the Southern Hemisphere when it is summer in the Northern Hemisphere?
- 5) What are the seasons like where you live? How are seasons different in other parts of the world?

Rubric:

Student:

Standard: Earth's spin axis is fixed in direction over the short-term but tilted relative to its orbit around the sun. The seasons are a result of that tilt and are caused by the differential intensity of sunlight on different areas of Earth across the year.

Recommendations	Indicator	Commendations
	<ul style="list-style-type: none">Recognize that Earth's spin axis is fixed in direction over the short-term but tilted relative to its orbit around the sun	
	<ul style="list-style-type: none">Cite evidence that the seasons are a result of that tilt and are caused by the differential intensity of sunlight on different areas of Earth across the year.	
	<ul style="list-style-type: none">Compare and contrast Earth season's to seasons on other planets.	

REFERENCES

Read the Standards. (n.d.). Retrieved from

<https://www.nextgenscience.org/search-standards>

Why Do We Have Seasons? (n.d.). Retrieved from https://nj.pbslearningmedia.org/resource/npls13.sci.ess.seasons/why-seasons/en/#.Wx6X4S_MyT9

C. (2015, May 21). Seasons and the Sun: Crash Course Kids 11.1.

Retrieved from <https://www.youtube.com/watch?v=b25g4nZTHvM>