

Does the Sun have Seasons?

Rich Task 1 Activity 7

Introduction:

The Sun is our nearest star and provides the conditions for life to exist on Earth. It's about halfway through its lifetime and acts as a nuclear reactor, giving us heat and light. It accounts for 99% of our solar systems' mass and one million Earth-sized planets could fit inside it. Within the Sun there are atoms of Hydrogen and Helium that are densely packed and collide violently with each other. The fusion of atoms that occurs in the Hydrogen core of the Sun generates light, which takes a hundred thousand years to escape the Sun's core and then travel for a further eight minutes to reach the Earth. Understanding the role the Sun plays in our lives is fundamental to understanding the Sun-Earth system (E & S LO 4).

This activity asks students to reflect on all of the activities which they have completed to address the original hypothesis: Does the Sun have Seasons?

The worksheet provides a space for students to bring [Rich Task 1 Activities 1 - 6](#) together and apply their gathered evidence for either agreeing or disagreeing with their hypothesis. They may also decide to change their original hypothesis based on the new information.

Preparation Required:

- Printing
- Recommended for students to have their other worksheets present.

Downloadable Materials:

- [Worksheet 1.7](#)
- [Expected Students Responses to Worksheet 1.7](#)

Relevant Junior Cycle Learning Outcomes:

Students should be able to...

NOS LO 7: Organise and communicate their research and investigative findings in a variety of ways fit for purpose and audience, using relevant scientific terminology and representations.

NOS LO 5: Review and reflect on the skills and thinking used in carrying out investigations, and apply their learning and skills to solving problems in unfamiliar contexts.

NOS LO 4: Produce and select data (qualitatively/quantitatively), critically analyse data to identify patterns and relationships, identify anomalous observations, draw and justify conclusions.

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NOS LO 2: Recognise questions that are appropriate for scientific investigation, pose testable hypotheses, and evaluate and compare strategies for investigating hypotheses.

E & S LO 4: Develop and use a model of the Earth-sun-moon system to describe predictable phenomena observable on Earth, including seasons, lunar phases, and eclipses of the sun and moon.

Learning Intentions:

Students will be able to...

- Apply their gathered evidence and knowledge to address their hypothesis.
- Clearly communicate their argument in agreement or disagreement with their hypothesis

Prior Knowledge/Horizon Content Knowledge:

- Presenting information
- Communicating
- Rich Task 1 Activities 1 - 6, worksheets 1.1 - 1.6

Differentiation and Accessibility Suggestions:

This activity requires some prior knowledge. Students can decide the depth of questioning and discussion in the class.

The teacher could share the worksheet as a presentation and facilitate class discussion without students working alone first.

The teacher can ask students to create a presentation to communicate their findings and conclusions to the class. The students could also work in groups to develop presentations.

The students may want to use the previous worksheets to articulate their arguments. Students may want to write or draw on worksheet 1.7 to help them formulate an argument.

Activity Outline:

Activity Name	Does the Sun have seasons?
Alignment to ISLE investigation	Analysing data to form an argument in agreement or disagreement with the original hypothesis
Rationale	To complete the investigation of “Does the Sun have Seasons?”
Activity Description	<i>(please see downloadable materials for the</i>

	<p><i>resources for this activity)</i></p> <p>Teacher can use the worksheet to prompt class discussion of whether or not the Sun has seasons, bringing together the understanding that the students have developed throughout activities 1 - 6.</p> <p><i>(Q1. Worksheet 1.7)</i> Students reflect on everything that they have learned and apply their conclusion from each activity to address the question: “Does the Sun have Seasons?”</p>
<p>Link to other activities</p>	<p>Links back to Rich Task 1 Activity 1 - 6.</p>
<p>Link to current research in DIAS Dunsink Observatory</p>	<p>The Solar and Space Weather group at DIAS Dunsink consists of PhD students, postdocs and professors who study different aspects of the Sun and Space Weather.</p> <p>Through their research, scientists can get daily updates on the activity of the Sun (https://solarmonitor.org) and advise on precautions that can be taken to protect Ireland’s power grid from potential solar storms.</p> <p>More information on specific projects can be found here: https://www.dias.ie/solarphysics</p>
<p>Related Magnifying Science Podcast from DIAS Dunsink Observatory</p>	<p><u>Podcast Description:</u> An interview with Alberto Cañizares who studies energetic explosions on the Sun, at DIAS Dunsink Observatory. The podcast offers insight for students on the reason why the study of the Sun is important and how it is possible to move from one area of STEM to another, because of the versatility of STEM degrees. (engineering → physics)</p> <p><u>Podcast episode:</u></p> <p>Coming soon!</p> <p><u>Podcast Description:</u> An interview with Dr Áine Flood who is a physicist, a science communicator and the Education and Public Engagement Manager at I-LOFAR in</p>

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	<p>Birr, Co. Offaly. The podcast offers insight for students on the reason why communication in science is so important, and also the importance of sharing science research with people outside of the scientific community.</p> <p><u>Podcast episode:</u></p> <p>Coming soon!</p>
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