

Instructional Recipe

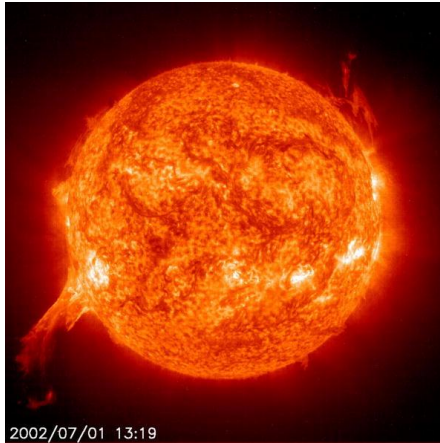
How Does the Sun Affect the Earth?

Fourth Grade, Science & Language Arts

Step 1 – Ask

Objectives: Students will analyze and explain how the Sun affects the Earth.

Introduction: Demonstrate the water cycle using a bowl of water (1/4 full) with an empty coffee mug placed in its center. [Note: There should be no water in the mug.] Cover the bowl with plastic wrap and secure the covering with a large rubber band. Place the bowl in direct sunlight. After several hours, observe the effects of sunlight on the water in the bowl.



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“In Space.” Online Image. EBSCO Image Collection. 6 October 2008
<http://search.ebscohost.com/login.aspx?direct=true&db=imh&AN=imh210259&site=srck5-live>

Ask:

- ★ What is the Earth’s major source of energy?
- ★ What roles does the Sun play in the water cycle?
- ★ What role does the Sun play in the growth of plants?
- ★ What role does the Sun play in the creation of winds?
- ★ What effect does the Sun have on ocean currents?

Vocabulary:

- ★ Sun
- ★ energy
- ★ water cycle
- ★ ocean currents
- ★ photosynthesis

Science TEKS:

(4.8) **Earth and space.** The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to: (B) describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process;

English/Language Arts TEKS:

(24) **Research/Gathering Sources.** Students determine, locate, and explore the full range of relevant sources addressing a research question and systematically record the information they gather. Students are expected to: (A) follow the research plan to collect information from multiple sources of information both oral and written, including: (ii) data from experts, reference texts, and online searches; and (iii) visual sources of information (e.g., maps, timelines, graphs) where appropriate; (C) take simple notes and sort evidence into provided categories or an organizer;

Technology Application TEKS:

(4) **Information acquisition.** (A) apply appropriate electronic search strategies in the acquisition of information including keyword and Boolean search strategies.
 (5) **Information acquisition.** (A) acquire information including text, audio, video, and graphics.
 (7) **Solving problems.** (A) use software programs with audio, video, and graphics to enhance learning experiences. (B) use appropriate software to express ideas and solve problems including the use of word processing, graphics, databases, spreadsheets, simulations, and multimedia.

Step 2 – Investigate

K-12 Databases Resources:

Search **EBSCO Kids Search** using Boolean logic such as: *Sun AND facts*.

- ★ **The Sun**. Monkeyshines on Health & Science, Dec2002 Astronomy, p2-3, 2p, 1 diagram; Reading Level (Lexile): 890; (AN 12866161)
- ★ **The Sun**. By: Farndon, John. *Space (1-59084-472-6)*, 2003, p47, 1p, 2 color; Reading Level (Lexile): 1150; (AN 9335256)
- ★ **The sun**. By: Prescott, Lyle; Marsella, Valerie. Ranger Rick, Jun94, Vol. 28 Issue 6, p40, 2p, 1 cartoon, 4 color; Reading Level (Lexile): **600**; (AN 9406162083)
- ★ "sun." *Britannica Elementary Encyclopedia*. 2008. Encyclopædia Britannica Online School Edition. 8 Oct. 2008
<<http://school.eb.com/elementary/article?articleId=353824>>.

Additional Websites:

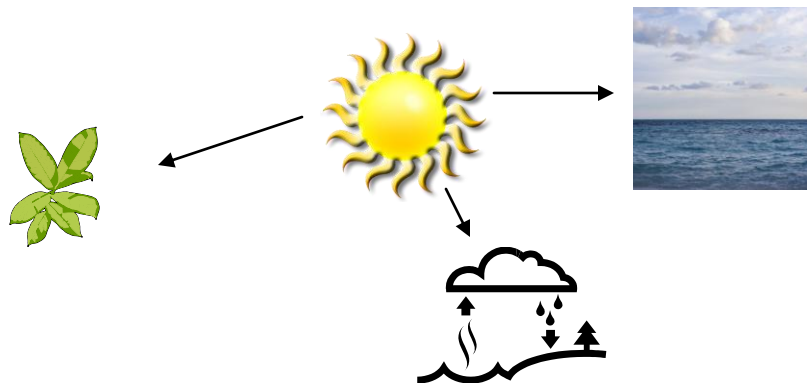
Water on the Move- <http://www.mos.org/oceans/motion/currents.html>

Books: *Photosynthesis: Changing Sunlight into Food* by Bobbie Kalman
The Sun by Robin Kerrod
The Day the Sun Went Out by Angela Royston



Step 3 – Create

Students will create a graphic organizer on which to take notes regarding the Sun's impact on the Earth.

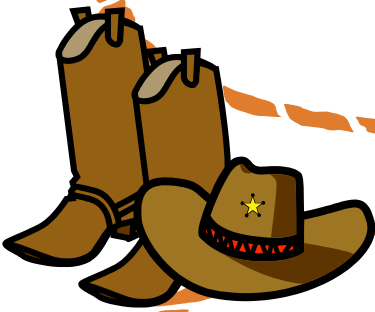


🔗 **Technology Link** - Students may use a graphic organizer program, such as Kidspiration, to create the note taking organizer.

Step 4 – Discuss

- ★ Students can create a poster to explain the Sun's impact on the Earth. The poster should include a title, illustrations, and at least three examples of the impact the Sun has on the Earth.
- ★ Students can write a paragraph summarizing the Sun's impact on the Earth. The paragraph should have a topic sentence, at least three supporting ideas, and a conclusion.

🔗 Technology Link – Students may use a word processing program, such as Microsoft Word to type their paragraph.



Step 5 – Reflect

Allow students to present their projects to the rest of the class. Use the following suggested rubric to assess the students' work. Make sure that the students are familiar with the rubric *before* they begin creating their project. They should refer to the rubric repeatedly to monitor their progress in creating their project.

🔗 Technology Link: You can also create your own rubric with your students at <http://rubistar.4teachers.org/index.php>.

Rubric Poster- Sun's Effects on the Earth

CATEGORY	4	3	2	1
Graphics - Clarity	Graphics are all in focus and the content easily viewed and identified from 6 ft. away.	Most graphics are in focus and the content easily viewed and identified from 6 ft. away.	Most graphics are in focus and the content is easily viewed and identified from 4 ft. away.	Many graphics are not clear or are too small.
Labels	All items of importance on the poster are clearly labeled with labels that can be read from at least 3 ft. away.	Almost all items of importance on the poster are clearly labeled with labels that can be read from at least 3 ft. away.	Several items of importance on the poster are clearly labeled with labels that can be read from at least 3 ft. away.	Labels are too small to view OR no important items were labeled.
Required Elements	The poster includes all required elements as well as additional information.	All required elements are included on the poster.	All but 1 of the required elements are included on the poster.	Several required elements were missing.
Title	Title can be read from 6 ft. away and is quite creative.	Title can be read from 6 ft. away and describes content well.	Title can be read from 4 ft. away and describes the content well.	The title is too small and/or does not describe the content of the poster well.
Grammar	There are no grammatical mistakes on the poster.	There is 1 grammatical mistake on the poster.	There are 2 grammatical mistakes on the poster.	There are more than 2 grammatical mistakes on the poster.
Attractiveness	The poster is exceptionally attractive in terms of design, layout, and neatness.	The poster is attractive in terms of design, layout and neatness.	The poster is acceptably attractive though it may be a bit messy.	The poster is distractingly messy or very poorly designed. It is not attractive.

Rubric

Paragraph- Sun's Effects on the Earth

CATEGORY	4	3	2	1
Content: FOCUS	Topic/subject is clear, though it may/may not be explicitly stated.	Topic/subject is generally clear though it may not be explicitly stated.	Topic/subject may be vague.	Topic/subject is unclear or confusing.
Content: ORGANIZATION	Organizational structure establishes relationship between/among ideas/events.	Organizational structure establishes relationships between ideas/events, although minor lapses may be present.	Organizational structure establishes some relationship between/among some of the ideas/events. The structure is minimally complete.	Organizational structure does not establish connection between/among ideas/events. The overall structure is incomplete or confusing.
Content: SUPPORT	Support information is related to and supportive of the topic/subject.	Support information has minor weaknesses in relatedness to and/or support of the topic/subject.	Support information has major weaknesses in relatedness to and/or support of the topic/subject.	An attempt has been made to add support information, but it was unrelated or confusing.
Content: STYLE - Sentence Fluency	Demonstrates skillful sentence fluency (varies length, good flow rhythm, and varied structure).	Demonstrates reasonable sentence fluency.	Demonstrates minimal sentence fluency.	Sentence fluency is lacking.
Conventions	Exhibits EXCELLENT CONTROL of grammatical conventions appropriate to the writing task: formation; standard usage including agreement, tense, and case; and mechanics including use of capitalization, punctuation, and spelling.	Exhibits VERY GOOD CONTROL of grammatical conventions appropriate to the writing task: formation; standard usage including agreement, tense, and case; and mechanics including use of capitalization, punctuation, and spelling.	Exhibits REASONABLE CONTROL of grammatical conventions appropriate to the writing task: sentence formation; standard usage including agreement, tense, and case; and mechanics including use of capitalization, punctuation, and spelling.	Exhibits MINIMAL CONTROL of grammatical conventions appropriate to the writing task: sentence formation; standard usage including agreement, tense, and case; and mechanics including use of capitalization, punctuation, and spelling.