



Educator Viewing Guide



Sunstruck (2016)

21 minutes

Travel back to the beginning of time and experience the birth of the sun. Discover how it came to support life, how it threatens life as we know it, and how its energy will one day fade away.

Topics covered:

The Sun; the Sun/Earth relationship; solar system

Interdisciplinary connections: social sciences, technology education

Key Terms and Concepts:

Atmosphere, Coronal Mass Ejections (CME), Energy, Geomagnetic Storm, Magnetic Field, Photons, Photosynthesis, Six Layers of the Sun, Solar Flare, Solar Wind, Space Weather, White Dwarf

Combine with these KidSpace Activities:

Engineering Lab

Discover the six simple machines and other engineering principles used in designing spacecraft while operating wheels, levers, pulleys, and more.

Magnetic Lab

Investigate the push and pull forces of magnetism while guiding the unique material, Ferrofluid, a nanometer-sized particle that acts like a magnetic solid and liquid.

PlaySpace!

Science begins with imagination. The space-themed playground offers many opportunities for space-themed play, space-related discoveries, and demonstrations of science concepts: gravity, friction, force, laws of motion, and more.



Learning Resources and Activities:

Create learning units designed around a visit to KidSpace! These web resources and activities are designed to illustrate concepts and ideas presented in the show. Many of these can be adapted to various age groups.

Sunstruck Educator's Resource Guide; Michigan Science Center and NASA

This educator's guide includes background information, a list of web resources and three activities: *Solar Oven, Solar Purifier, and Solar Balloon* (energy).

<http://hwn4wh6n4d16q8cf3wn1a6ia.wpengine.netdna-cdn.com/wp-content/uploads/2016/04/Sunstruck-Educators-Guide.pdf>

Sunstruck Teacher Resource Information; Michigan Science Center and NASA

This teacher resource contains information about the Sun, Space Weather, Global Warming and more. Includes links to NASA developed classroom lesson plans and activities: *Reason for the Seasons, Seasons and Cloud Cover, Space Math*, and more.

<http://hwn4wh6n4d16q8cf3wn1a6ia.wpengine.netdna-cdn.com/wp-content/uploads/2016/04/Sunstruck-Teachers-Resource-Guide.pdf>

Magnetic Storm Activity with Teachers Guide; NOVA Teachers, PBS

This activity is designed to help learners understand the magnetic fields around different shapes of magnets. Includes objectives, materials list, procedure, answer sheet, additional resources, and national science standards.

http://www.pbs.org/wgbh/nova/education/activities/3016_magnetic.html

Exploring Magnetic Fields; American Association for the Advancement of Science (AAAS)

This site contains lesson plans and directions for two activities designed to explore magnetic fields. Includes material list, directions, student worksheets, assessment and extensions.

<http://sciencenetlinks.com/lessons/exploring-magnetic-fields/>

Sun As a Star: Science Learning Activities for Afterschool; NASA Education

This educator resource guide provides background information and complete instructions for eight activities designed for elementary-age students: *What Do We Know About the Sun?, What Colors Are in White Light?, How Can We Find Out About Invisible Light?, How Does Light Travel?, What Can We Learn About the Sun from Shadows?, Does the Sun Move?, How Do Scientists Look at the Sun?, and Are All Stars Like the Sun?*

https://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Sun_As_a_Star_Educator_Guide.html

Shadow Play; McDonald Observatory

This site provides descriptions for two activities designed for young children to learn about the Sun's relative motion in the sky by experimenting with shadows. Also includes discussion of Anasazi Sunwatchers archaeological sites.

<https://stardate.org/sites/default/files/pdfs/teachers/ShadowPlay.pdf>



Comprehension Questions:

Help learners process the concepts and ideas presented in the show with these questions.

1. What are the six layers of the Sun? Which layer is the hottest? Why?
2. Why does being in space, such as living on the International Space Station, increase the potential dangers from the Sun?
3. What does the Earth have that protects us from most of the harmful radiation from the Sun?
4. What kinds of problems do Solar Flares cause to human society?
5. Why is the potential for disruption more problematic now than in the past? (technology-driven society)

Further Research and Discussion

Ask learners to conduct research about the potential risks of space weather, such as geomagnetic storms. What economic and social impacts might result from Coronal Mass Ejection (CME)? What are scientists doing to protect the power grid and other technologies in case of a CME? (See NASA, https://science.nasa.gov/science-news/science-at-nasa/2009/21jan_severespaceweather)

This show covers content that addresses Colorado Academic Standard in Science (Physical Science and Earth Systems Science). See [Planetarium Show Academic Standard Chart](#) for details by grade.