

GLOSSARY

CORONA

The outer part of the sun's atmosphere.

ATMOSPHERE

A mostly gaseous mass surrounding planets and some moons, held in place by gravitational forces.

GRAVITY

The pull of a celestial body on other objects as a result of weight or mass.

NUCLEAR FUSION

The combining of atoms that produce great amounts of heat and other types of energy.

PLANET

One of the large celestial bodies in our solar system which revolve around the sun and do not give off light of their own.

SOLAR ECLIPSE

Occurs when the moon moves between the sun and the Earth. Allows one to see the corona of the sun.

STAR

A self-luminous, self-contained burning mass of gases visible at night as a twinkling point of light.

SUN SPOTS

The dark areas on the sun's surface, associated with the sun's magnetic fields.

May be reproduced for use in the classroom.

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Show Me Science

The Wonders of Astronomy & Space

K4559DVD

The Sun: Heat, Light & Life

Advanced Teachers Guide

SYNOPSIS:

The sun is our lifeline – the source of energy for our planet. The light and heat of the sun travels 93 million miles to Earth in just eight and a half minutes. Without the energy that comes from the sun, the Earth would be desolate. Without the sun's rays, the Earth would be dark and cold, life as we know it would be impossible. Directly or indirectly the sun furnishes most of the energy which supports life on Earth; in one way or another, our food and fuel sources are born from sunlight. In this program, we explore the sun from the inside out. We explain some of the latest theories behind the raging nuclear reactions at the sun's core and how scientists are using instruments both in space and on Earth to study the sun.

CURRICULUM UNITS:

- Astronomy
 - Earth Science
 - Engineering
 - General Science
 - Nuclear Science
 - Physics
 - Space Science
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CAREER OPPORTUNITIES:

- Astronaut
- Astronomer
- Engineer
- Meteorologist
- Physicist
- Scientist

PROGRAM OVERVIEW:

The nuclear furnace at the center of the sun generates unbelievable amounts of energy. Scientists believe the energy comes from nuclear fusion, a process that occurs under extreme pressures and temperatures. Throughout fusion, it is estimated that 4 million tons of matter are lost every second. This conversion of matter provides the energy that keeps the sun shining – and our Earth alive.

ISSUES & CRITICAL THINKING:

- 1) After showing the program, ask the class the following:
 - a) What do scientists believe is the source of the sun's energy?
 - b) What would happen to life on Earth if energy stopped flowing from the sun? Why would this happen?
 - c) What happens to the sun at night?
 - d) How big is the sun compared to Earth?
 - e) How have scientists gained new information on the sun?
- 2) Ask students to draw a picture of the sun that shows the core, sunspots and the corona.
- 3) Demonstrate an eclipse by using a strong light source, like a big flashlight or a lamp and different sized balls. Darken the room so that the shadows are easier to see.
- 4) Ask students to list every type of energy they can think of. Then ask them to explain how the sun's energy is the source for each type of energy on the list.
- 5) Ask students to find in the newspaper the times that the sun rises and sets. Then have them calculate how many hours of sunlight they receive.