

#9091

DESTINATION COSMOS: EPISODE #18

"STARDUST"

LANDMARK MEDIA

1998

Grade Levels: 5-10

10 minutes

1 Instructional Graphic Enclosed



DESCRIPTION

Shares a broad look at stars--their formation, life, and types of death. Mentions red giants, blue stars, supernovas, red dwarfs, black holes, and others. Notes that astronomers study on a star's light to learn about it. Projects what will happen to our star, the sun.

ACADEMIC STANDARDS

Subject Area: Science

- Standard: Understands the composition and structure of the universe and the Earth's place in it
 - Benchmark: Knows characteristics of the Sun and its position in the universe (e.g., the Sun is a medium-sized star; it is the closest star to Earth; it is the central and largest body in the Solar System; it is located at the edge of a disk-shaped galaxy)
 - Benchmark: Knows that the universe consists of many billions of galaxies (each containing many billions of stars) and that incomprehensible distances (measured in light years) separate these galaxies and stars from one another and from the Earth

INSTRUCTIONAL GOALS

1. To classify stars according to size and shapes.
2. To explain theories about star, solar system, and galaxy formation.

VOCABULARY

1. supernovae
2. white dwarfs
3. nuclear fusion
4. red giant star
5. red dwarfs
6. blue supergiants
7. Alpha Centauri
8. Proxima Centauri
9. novae
10. pulsar

BEFORE SHOWING

1. Display photographs of stars, comparing brightness, shapes, colors, and clusters.
2. Discuss the significance of the colors of stars.
3. Discuss how scientists are able to study the origins and history of stars. Discuss the contributions of the space missions and the Hubble Space Telescope.
4. Discuss the meaning of the title of the video "Stardust." What does the title imply?

DURING SHOWING

Discussion Items and Questions

1. View the video more than once, with one showing uninterrupted.
2. Pause at the scene showing the Alpha Centauri. Point out the three stars to show it is a multiple-star system.
3. Pause at the section showing the Proxima Centauri. Clarify that the sun is actually the closest star to us. Proxima Centauri is part of a constellation.
4. Pause at the scene showing the egg-shaped stars. Point out the path in which material passes through.
5. Pause at the section showing the white dwarf star with the giant star. Discuss why an explosion resulted.
6. Pause at the graphic showing the light of a star being split into its components.
7. How is this similar to a bar code on products in a store?
8. What information is gathered from analyzing the light rays from a star?

AFTER SHOWING

Discussion Items and Questions

1. What are *supernovae* and how are they formed?
2. What do scientists think will happen to the sun at the end of its cycle?
3. How many stars are in the Earth's galaxy?
4. The sun is about how many miles in diameter?
5. Where does the sun get its energy?
6. What prevents the sun from exploding?
7. What will the sun become when it is much older?
8. How wide is a red giant star?
9. How large are red dwarfs?
10. How old is the sun?
11. What is the closest multiple-star system to the sun?
12. Which star is the closest to Earth?
13. What are *novae* and how are they formed?
14. What is the *Milky Way*?
15. How can scientists determine what chemical elements are found in a star?
16. How do scientists determine the temperature of a star and the intensity of its magnetic field?
17. How are stars sorted into groups?
18. In which areas in the universe are chemical elements like iron formed?
19. What is a *pulsar* and how is it formed?
20. What kinds of stars form black holes?



Applications and Activities

1. Complete a chart containing information about various kinds of stars. (See INSTRUCTIONAL GRAPHICS.)
2. Illustrate and explain the life cycle of the sun.

3. List poems and other literary works that have themes based on stars or suns.
4. Research sizes of the diameters of different kinds of stars. Write them in scientific notation.
5. Report on space missions and other projects that have aided in learning more about the origin and death of stars in the universe.
6. Report on Stephen Hawking's theories about black holes.
7. Display photographs of various kinds of stars taken by the Hubble Space Telescope.



RELATED RESOURCES



Captioned Media Program

- Shooting Stars #3177
- Stars: A First Film #1427
- The Universe #3310



World Wide Web

The following Web sites complement the contents of this guide; they were selected by professionals who have experience in teaching deaf and hard of hearing students. Every effort was made to select accurate, educationally relevant, and "kid safe" sites. However, teachers should preview them before use. The U.S. Department of Education, the National Association of the Deaf, and the Captioned Media Program do not endorse the sites and are not responsible for their content.

- **INTRODUCTION TO SUPERNOVAE**

http://www.chapman.edu/oca/benet/intro_sn.htm

Answers questions about supernovae such as what they are, what causes them to explode, what characteristics they have, and what happens after the explosion.

- **HISTORY OF THE UNIVERSE**

<http://www.historyoftheuniverse.com/index.html>

Contains basic information about the origin of the universe in a simple and understandable way. Includes questions, answers, and comments.

- **THE NATURES OF THE STARS**

http://www.astro.uiuc.edu/~kaler/sow/star_intro.html

Provides a nontechnical review of stars and their nature for beginners. Includes information on black holes, galaxies, giant stars, neutron stars, pulsars, supergiants, supernovae, and white dwarfs.

INSTRUCTIONAL GRAPHICS

- **INFORMATION ABOUT STARS**

Information About Stars



	How Formed	Size	Characteristics	Expected Lifetime	Well-Known Stars
Supernova					
Black Hole					
Supergiant					
Red Giant Star					
Red Dwarf					
Neutron Star					
Pulsar					