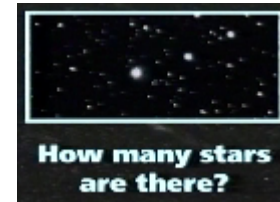


Space: All About Stars

DVD and VHS - Teacher's Guide



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Introduction

This guide is a supplement, designed for teachers to use when presenting this programme in a classroom. It also contains the programme summary and vocabulary.

Before Viewing: Research in learning suggests that it is important for the teacher to discover what the students know — or think they know — about a topic, at the start, so that their accurate conceptions can be validated and reinforced, and their misconceptions identified and corrected. Therefore, after reviewing the pre-viewing discussion questions provided for your class, create a “Everything We Know About...” list with them.

Preview key vocabulary words and have students raise additional questions they hope will be answered by this program. Most importantly, students should be told that as “star detectives” they must listen closely, so that after viewing the program, they will be able to tell whether or not the facts/beliefs they put on their list were scientifically accurate.

After Viewing: After a brief discussion about the program, challenge your “star detectives” to prove or disprove the accuracy of the facts they put on their “Everything We Know About...” list. Discuss what else they learned and use the follow-up questions and activities to inspire further discussion. Encourage students to research the topic further using the Internet and the key vocabulary words.

Pre-viewing Discussion

Before students generate their list of “Everything We Know About...” this topic, stimulate and focus their thinking by raising these questions so that their list will better reflect the key ideas in this programme:

1. What are stars and what are they made of?
2. Why don't we see stars during the day?
3. Why don't we see stars every night?
4. Have we ever sent astronauts to explore a star?

After the class has completed their “Everything We Know About...” list, and before watching the programme, ask them what other questions they have that they hope will be answered during this program.

Ask students to listen closely to the DVD to check if everything on their class list is accurate and to hear if any of their own questions are answered.

Teacher's Guide - Programme

Space: All About Stars

Students will increase their understanding of stars when they join a Space Camp shuttle crew — along with their trusty first mate, Fido the basset hound — on an exciting and informative mission to the stars.

Collecting information as they go, the crew begins with the sun, the star located closest to the Earth. The sun is a medium-sized star that is very similar to all the other stars in the universe, differing only in size and in surface temperature — from hot “blues” to cool “reds.”

Stars are the primary providers of light and heat in the galaxy, both of which are explosively created when hydrogen gas turns into helium.

The Space Camp crew also learns about constellations such as the Big Dipper and Orion, and locates the North Star, a trusty benchmark in the night sky that has aided navigators for centuries.

In addition, students experiment with telescope mirrors while learning about the Hubble Space Telescope, a tool that has been extremely helpful in learning more about stars and other celestial bodies.

Teacher's Guide - Vocabulary

Space: All About Stars

The following words are included for teacher reference or for use with students. They are listed in the order in which they appear in the video.

star — A bright object seen in the night sky, made up of hot, glowing gases; the primary source of light and heat in the universe.

astronauts — Men and women who travel to space to study the solar system.

telescope — An instrument used to view distant objects in space.

sun — A medium-sized star and the center of our solar system that provides our planet with light and heat.

galaxy — Billions of stars, gas and dust that are held together in space by gravity.

Milky Way — All of the planets, stars and celestial bodies that are part of the galaxy to which our solar system belongs.

gravity — A force that pulls any two objects together.

astronomer — A scientist who studies objects in space.

hydrogen — A gas that stars are made of, which when heated turns into helium, exploding and giving off heat and light energy.

helium — The gas into which hydrogen is transformed in stars, exploding and giving off heat and light energy.

Proxima Centauri — After our sun, the star located closest to the Earth.

Big Dipper — A constellation whose pattern is similar in form to a ladle.

Little Dipper — A constellation whose pattern is similar to but smaller than that of the Big Dipper.

Orion — A constellation named by the Greeks after a great hunter because of its shape in the night sky.

constellations — Patterns of stars in the night sky that appear to create outlines of pictures when viewed from the Earth.

Polaris — Also known as the North Star; the only star in the northern hemisphere that does not appear to move across the sky as the Earth rotates due to the fact that it is in line with the Earth's axis.

compass — A device used for determining direction that contains a magnetic needle that points north.

shooting star — Not a star, but the bright light that shoots across the night sky when a meteoroid enters the Earth's atmosphere.

meteoroid — A small piece of rock and/or metal that enters the Earth's atmosphere.

observatories — Buildings used to house very large telescopes, usually located on mountain tops or in remote areas.

Hubble Space Telescope — A large telescope that orbits the Earth, providing us with the clearest view of outer space.

supernova — The explosion that occurs when a star burns its fuel too quickly and releases its energy into space.

Teacher's Guide - After viewing

Space: All About Stars

Follow-up Discussion

The most important part of this segment is to examine facts and beliefs generated by the class in their “Everything We Know About...” list. Students will retain their previous misconceptions — in preference to the new information — until they actively recognize and correct their own errors. It is important to lead students to the correct ideas while identifying and correcting any misconceptions from the class list. Encourage students to share the answers they got to the questions raised before viewing the program. Raising a thought-provoking question is a good way to assess the overall depth of understanding.

A couple of suggestions are listed below:

1. Ask the class whether it would be possible to live on a star. Why or why not?
2. Discuss why it is easier to see more stars more clearly when you are out in the country than when you are in or near a city.
3. Have students explain why stars and constellations seem to move across the sky throughout the night.
4. Discuss with students why the brightest stars in the night sky are not necessarily the closest.

Further suggestions for “after viewing” - next page.

Teacher's Guide - After viewing

Space: All About Stars

Focus Questions

You may wish to ask your class the following questions to assess their comprehension of key points presented in the program:

1. What are stars?
2. How many stars are there?
3. Which star is closest to the Earth?
4. How do scientists study stars?

Other questions you can ask your class to assess comprehension of additional points presented in this show are as follows:

1. Why do stars look so tiny when they are all so huge?
2. Why does the sun look different than other stars?
3. What happens when a star's hydrogen is changed into helium?
4. What is a constellation? Name three constellations and describe what pattern they form.
5. What is Polaris and why is it important to us?
6. What is a "shooting star"?
7. What is the benefit of using a space telescope?
8. What color are the hottest stars? What color are the coolest stars?
9. Are all stars the size of our sun?
10. Why should you never look directly at the sun?

Follow-up Activities

- Have students draw some common constellations and research the origins behind their names. In addition, have students create their own constellations and write a story that explains the story behind the name they choose.
- Using paper towel cylinders, have students create constellation viewers. Draw dots representing the stars of a constellation on a circle the size of the tube's opening. Use a pin or a small pencil to make a hole for each star. Label the cylinder and tape the circle to the end of the tube, making sure it is not reversed when viewing it through the tube.
- Have students find information about other stars besides the sun and Polaris.
- Provide students with a sky calendar for the current month and have students do some night sky viewing with an adult. In a written or oral presentation, students should share their experience with the class, and report on what constellations or stars they could see.
- Ask an amateur astronomer to bring a telescope to school and make a presentation to the class on the instrument, demonstrating how it works.