GLOSSARY:

Big Dipper: The group of seven bright stars in Ursa Major resembling a dipper in outline.

Constellations: Any of the 88 groups of stars as seen from the earth and the solar system.

Milky Way: The spiral galaxy containing our solar system.

Orbit: The half of the earth between the North Pole and the equator.

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Show Me Science

The Wonders of Astronomy & Space

Night Sky –
Navigating the Constellations

K4601DVD

Teachers Guide

SYNOPSIS:

Night Sky is a beginner's guide to finding 88 constellations and key navigational stars. Ancient civilizations such as the Babylonians, the Chinese and the Greeks studied the stars without the benefit of telescopes and yet identified patterns of stars that we still use today. These early scientists collected the first data in the science of Astronomy.

Students will learn about the specific patterns of stars in the night sky and learn how to decode the constellations and other important celestial bodies.

CURRICULUM UNITS:

- Astronomy
- Integrated science
- Physical science
- Physics

CAREER OPPORTUNITIES:

- Astronaut
- Astronomer
- Astrophysicist
- Engineer
- Physicist

PROGRAM OVERVIEW:

Constellations and charted the rising and setting of the sun, this program presents a detailed survey of the most important contributors to this science. Students will see how the Constellations of the Zodiac were described and how the Chinese made the first star maps that featured such celestial objects as the Milky Way. To predict when a comet might reappear, scientists today use the Chinese records of comets and eclipses of the sun. Greek Astronomers identified that the moon was lit by light reflected from the sun. Eratosthenes predicted that the Earth was round and he approximated its circumference. Other Greek scientists such as Aristotle and Ptolemy theorized that the Earth was the center of the universe, a theory that was widely accepted for almost two millennia.

Understanding what is happening in the universe does not take a telescope with a giant mirror or a space telescope. Many amateur astronomers study the night sky and occasionally make discoveries. All that is needed is a simple telescope and a map of the night.

The Earth's spin causes the stars to move nightly. Your location on Earth determines which stars you can see and even the season influences which stars are visible. Ancient astronomers used imaginary lines to create patterns so they could more easily identify stars. Each pattern was given a legend. Even today, this helps us identify parts of the night sky.

The Greeks named most of the constellations in the northern hemisphere, whereas constellations visible in the southern hemisphere have been named more recently. The most distinctive is Orion, which is visible from everywhere on Earth. Recognizing constellations allows us to find pointers to other stars and constellations. For example, there are two stars in the bowl of the Big Dipper constellation that point to the pole star, Polaris. Polaris is the only star that is almost stationary. It lies directly over our north pole. Because it moves so little, Polaris is useful as a tool to track your movements. However, Polaris will not always be the pole star because the Earth wobbles on its axis.

ISSUES & CRITICAL THINKING:

1. Explain why Polaris will not always be the pole star.

2. Describe how a telescope in space can see further back in time than a telescope based on Earth.

3. Explain how the colors of light that a star emits can be used to determine its distance from Earth and its composition.

4. Discuss how the Big Dipper is an asterism and is only a part of the constellation Ursa Major. How many starts are in the Big Dipper and what are their names.