



THE STAR★WITNESS

Supplemental Educational Support Materials

for Special Feature: "Hubble Reveals Orion
in Picture-Perfect Glory"

The Greek Myth Behind the Constellation Orion

Orion, the hunter, appears in the winter sky, with his bow and his hunting dog, Sirius, trailing behind him.

Greek mythology tells us that, in ancient Greece, Orion was known as a talented hunter. But his boast that he could rid the earth of all the wild animals angered the earth goddess, Gaia. She sent a scorpion to defeat Orion. Orion tried to battle the scorpion. But he quickly realized that he could not shoot his arrow through the creature's armor.

To avoid the scorpion, he jumped into the sea. It was then that Apollo (the Greek god of the Sun) decided to take action. He pointed out to his twin sister, Artemis, a small black object in the sea. Claiming it was a horrible villain, he dared her to shoot it with her bow and arrow. Artemis easily hit the target. When she swam out to retrieve her victim, however, she discovered that the villain was her friend, Orion.

Artemis begged the gods to bring Orion back to life, but they refused. So, instead, she put Orion's picture in the sky so that she could always see him.

Discussion questions

1. Explain how the Orion Nebula got its name.

Answer:

The name "Orion" comes from its location in the Orion constellation. The word "Nebula" means that the object is a celestial cloud of gas and dust and appears as a cloudy patch in the night sky.

2. The Orion constellation is visible in the Northern Hemisphere's winter sky. List any other constellations that you are aware of and identify the season of the year when the constellations are visible in the night sky. Why do you think some constellations are visible at only certain times of the year?

Answer: Student responses will vary. Responses may include some of the following constellations:

- The winter constellations include the zodiacal constellations of Gemini, the Twins; Cancer, the Crab; and Leo, the Lion. Other winter constellations include Canis Major, the Big Dog, and Hydra, the Water Monster.

- The spring constellations include the zodiacal constellations of Virgo, the Virgin; Libra, the Scales; and Scorpius, the Scorpion, as well as Hercules, the Hero.
- Summer constellations include the zodiacal constellations of Sagittarius, the Archer; Capricorn, the Sea Goat; and Aquarius, the Water Bearer. Other familiar summer constellations include Pegasus, the Flying Horse, and Cygnus, the Swan.
- The fall constellations include the zodiacal constellations of Aries, the Ram; Taurus, the Bull; and Pisces, the Fishes. Additionally, Andromeda, the daughter of Cepheus, and Perseus, the Hero, are visible in the autumn sky.
- There are five constellations that are very close to the North Star. This means that they are visible in the northern sky all year long. These include: Ursa Major, the Great Bear; Ursa Minor, the Small Bear; Draco, the Dragon; Cassiopeia, the Queen of Ethiopia; and Cepheus, the King of Ethiopia.
- Students may incorrectly identify the Big Dipper or the Pleiades as constellations, but they are “asterisms” – subsets or supersets of constellations. For example, the Big Dipper is part of the constellation Ursa Major and the Pleiades are found in Taurus.
- Different constellations are visible at certain times of the year due to Earth’s orbit around the Sun. Each day our sky changes a little bit, which causes some constellations to disappear from sight and others to appear. Since we see different parts of the sky each season, we also see different constellations each season.

3. Look at the stars in the Orion Nebula image. List similarities and differences between the star images.

Answer: Student responses will vary. Some possible responses include:

- There is a range of star sizes and colors. Star colors include blue, white, orange, and red.
- The brightest stars in the middle are also very big.
- One star in the lower right is big and blue.
- The red/orange stars are small.
- White stars are medium-sized.

4. If you could ask a scientist several questions about the Orion Nebula, what would they be?

Answer: Students responses will vary. Some questions students might ask are:

Why are the stars different colors or what is the significance of the stars’ colors?

How was the nebula created?

What is the nebula made of?

Why are parts of the nebula brighter than others?

Why is there a bright horizontal line just below the brightest region of the nebula?

Why does some of the dust appear to make curves and circles?

5. Have you ever seen the Orion Nebula through a telescope? If so, describe what you saw.

Answer: The details visible in the Hubble image are not visible through a ground-based telescope. If you have never seen the Orion Nebula through a telescope, you can become a “guest observer” at the MicroObservatory Web site and request that a telescope snap a picture of the star-forming region. Then you can view the image on the Web site. To become a guest observer, go to: <http://mo-www.harvard.edu/MicroObservatory/>

Vocabulary words

Astronomer

A scientist who studies the universe and the celestial bodies residing in it, including their composition, history, location, and motion. Many of the scientists at the Space Telescope Science Institute are astronomers. Astronomers from all over the world use the Hubble Space Telescope.

Nebula

A cloud of gas and dust located between stars and/or surrounding stars. Nebulae are often places where stars form.

Star

A huge ball of gas held together by gravity. The central core of a star is extremely hot and produces energy. Some of this energy is released as visible light, which makes the star glow. Stars come in different sizes, colors, and temperatures. Our Sun, the center of our solar system, is a yellow star of average temperature and size.

Stellar nursery

A region in space where stars are forming from a cloud of gas and dust.