



## THE STAR★WITNESS

### Supplemental Educational Support Materials for Special Feature: “Xena: The Tenth Planet?”

#### Discussion questions

**Q1.**

**Explain how Xena and Pluto are similar to each other.  
How are they different from each other?**

**Answer:**

Xena and Pluto are similar in size. Xena is only slightly larger than Pluto. They both reside in the Kuiper Belt, so they probably have similar makeups – chunks of ice and rock. The pair has differences, too. Xena is more than three times farther from the Sun than Pluto. Xena also takes more than twice as long to travel around the Sun than Pluto.

**Q2.**

**Why is Xena so bright?**

**Answer:**

Xena is bright because its surface is very reflective. Light reflects off Xena’s surface like sunlight bounces off newly fallen snow. Measurements by the Hubble Space Telescope show that Xena is roughly the same size as Pluto. Because Xena is very bright and small, it must have a very reflective surface.

**Q3.**

**If Xena were half as reflective as it is, do you think astronomers would have found this icy body?**

**Answer:**

You might think that astronomers still would have discovered Xena because it is slightly larger than Pluto. This answer is incorrect. Xena is small and far away from Earth. Astronomers spotted Xena because it reflects lots of light. Xena is so far away that, if it did not reflect as much light as it does, it would be too dim for astronomers to see with telescopes.

**Q4.**

**Do you think Xena should be classified as a planet? Why or why not?**

**Answer:**

Your answers will vary. You might think Xena should be classified as a planet because it is larger than Pluto. Pluto, however, is not a rocky planet like Mercury, Venus, Earth, and Mars. It is not

*Continued ...*

a gas giant planet like Jupiter, Saturn, Uranus, and Neptune. You might think Pluto should be called a Kuiper Belt object and not a planet. Xena, therefore, also should be called a Kuiper Belt object.

## 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.

### **Atmosphere**

The layer of gases surrounding the surface of a planet, moon, or star.

### **Diameter**

The distance from one side of a circle to the other measured through the center. For telescopes, the diameter of a lens or mirror is measured from one side to the opposite side, passing through the center.

### **Kuiper Belt**

A region in our outer solar system where many “short-period” comets originate. The orbits of short-period comets are less than 200 years. This region begins near Neptune’s orbit at 30 astronomical units (AU) and extends to about 50 AU away from the Sun. An astronomical unit is the average distance between Earth and the Sun. The Kuiper Belt may have as many as 100 million comets.

### **Methane**

A chemical compound consisting of five atoms: one of carbon and four of hydrogen. On Earth, methane is a colorless, odorless gas and is the principal ingredient of natural gas. In the cold vacuum of space, methane is a white solid but, when hit by sunlight, it can become a gas.

### **Observation**

In science, an observation is a fact or occurrence that is noted and recorded. The Hubble Space Telescope is a tool astronomers use to make observations of celestial objects.