



## THE STAR★WITNESS

### Supplemental Educational Support Materials for Special Feature: “A Pluto-bound Spacecraft Gets a Boost From Jupiter ”

#### Discussion questions

##### Q1.

1. If you could talk to the New Horizons mission scientists, what questions would you ask them?

##### Answer:

Depending on your interest, you might like to know more about the spacecraft and ask questions such as:

- Why does the spacecraft need a boost from Jupiter?
- What kinds of instruments are on the spacecraft?
- Why does it take so long to get to Pluto?
- Why hasn't a spacecraft been sent to Pluto sooner?
- Why isn't there a motor on the spacecraft to make it go even faster?

You might also be curious about Pluto and the Kuiper Belt and ask these kinds of questions:

- How/why did you decide to go to Pluto and the Kuiper Belt?
- What do you expect Pluto's surface to look like?
- Do you think the other Kuiper Belt objects will look like Pluto?
- Do you think you might discover other Kuiper Belt objects?
- How do scientists find other Kuiper Belt objects if they are so small and so far away?

##### Q2.

2. If it took only about a year for the New Horizons spacecraft to travel from Earth to Jupiter (passing Mars' orbit), why will it take eight years to get from Jupiter to Pluto (passing the orbits of Saturn, Uranus, and Neptune)? Note: The graphic “Timeline of New Horizons' nine-year journey from Earth to Pluto” may help you answer this question.

##### Answer:

As the “Timeline of New Horizons' nine-year journey from Earth to Pluto” graphic shows, the distance between Earth and Jupiter is much smaller than the distance between Jupiter and Pluto.

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The planets are not equally spaced. The farther a planet is from the Sun, the greater the distance to its nearest neighbor. The distance between Jupiter and Pluto is almost nine times greater than the distance between Earth and Jupiter. The added speed of the spacecraft will cut the journey time to eight years.

**Q3.**

**New Horizons will not arrive at Pluto until July 2015. What will you be doing when the news is announced and the first pictures are released?**

**Answer:**

If you are in fourth grade now, you will have recently graduated from high school! If you are in a higher grade, you will no longer be in high school. You may be preparing for your life's work by attending college or a trade school. You may be out on your own, working and living independent of your family.

## Vocabulary words

### **Atmosphere**

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

### **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.

### **Plume**

A column of material that is shaped like a long feather.

### **Satellite**

A man-made object that orbits Earth, the Moon, or another celestial object.