Discussion questions

**Q1:**
If you are planning to observe the comet, what would you need to know in order to see it in the sky?

**Answer:**
A student’s answer will vary but should include the following ideas. When making the observations, a student should know the direction of north, south, east, and west. A student also should know where the comet is located in the sky. When the comet is visible in the morning, before dawn, it will be in the eastern sky because it is near the rising Sun. In December, when the comet is visible in the evening, the student should look in the western sky, near the setting Sun. Check “Tonight’s Sky” for more specific information regarding the comet’s location. Go to [http://amazing-space.stsci.edu/tonights_sky/](http://amazing-space.stsci.edu/tonights_sky/)

**Q2:**
Describe the anatomy of a comet.

**Answer:**
A comet is made up of three distinct parts: a nucleus, a coma, and a tail. The nucleus is an irregularly shaped ball of ice and rocky debris. The coma is a bright, huge sphere of gas and dust that surrounds the nucleus. It forms when the comet nears the Sun and the ice near the surface of the nucleus warms, releasing the gas and dust. The tail is either made up of fine dust or ionized gas. The tail is created when the Sun's radiation and solar wind sweep material from the coma outward. Some comets have no tails, and some may have more than one.
Q3:
Describe how a comet changes as it approaches the Sun.

Answer:
As the nucleus warms up, the evaporating ice forms a coma. The warmer it gets, the more gas and dust vaporize from the surface, until a tail may form. Tails are made up of dust or ionized gas. Both dust tails and ion tails are pushed directly away from the Sun, but the dust tails move away slower and tend to curve slightly in the direction of the comet’s orbit.

Vocabulary words

**Astronomical Unit (AU)**
A unit of length commonly used for measuring the distances between objects within the solar system. An AU is the average distance between the Earth and the Sun, which is about 93 million miles (150 million kilometers).

**Comet nucleus**
The core of a comet, made up of ice, dirt, and rock.

**Comet tail**
A long, thin cloud made up of dust and gas from a comet's coma. A tail forms when solar wind and radiation pushes dust and gas from the coma outward and away from the Sun in either a slightly curved path (for dust) or a straight path (for gas).

**Oort Cloud**
A vast spherical region in the outer reaches of our solar system where billions to trillions of long-period comets (those with orbital periods greater than 200 years) reside. Comets from the Oort Cloud come from all directions, often from as far away as 4.6 trillion miles (50,000 astronomical units).

**Radiation**
Energy that travels through space or some material. Heat and all forms of light are types of radiation.

**Solar wind**
A continuous stream of charged particles (mostly electrons and protons) flowing from the Sun at millions of miles (millions of kilometers) an hour. The solar wind causes the tails of comets to point away from the Sun and, through interaction with Earth's magnetic field, is responsible for the Northern and Southern Lights.
Language Arts
Standard 7. Uses skills and strategies to read a variety of informational texts.

**Level II (Grade 3–5)**
Reads a variety of informational texts (e.g., textbooks, biographical sketches, letters, diaries, directions, procedures, magazines).

**Level III (Grade 6–8)**
Reads a variety of informational texts (e.g., electronic texts; textbooks; biographical sketches; directions; essays; primary source historical documents, including letters and diaries; print media, including editorials, news stories, periodicals, and magazines; consumer, workplace, and public documents, including catalogs, technical directions, procedures, and bus routes).