

Chapter 22

ENRICHMENT

Use with Section 4

• Other Objects in the Solar System

New Information from an Old Comet

Read the following information and answer the questions that follow.

Comet Halley was observed as early as 240 B.C. Since the first record of its appearance, the comet has been a great mystery. In 1986, the European Space Agency (representing a number of countries in Europe), the then Soviet Union, and Japan sent space probes to get a closer look at Comet Halley. These probes provided us with startling new information about the comet.

The most exciting new information was the detail of the comet's elongated, peanut-shaped nucleus. Scientists think the comet has a nucleus composed of some combination of rock and ice. It measures 15 km × 8 km × 8 km and contains several shallow craters. Each crater is about

1 km in diameter. Comet Halley's mass is 1017 g, with an average density of about 0.3 g/cm³. The nucleus is covered with a layer of dust which retains heat. When Comet Halley is closest to the sun, temperatures can rise to about 77°C. Each large dust grain is thought to consist of many tiny particles with spaces in between. Some of these pores are filled with ice, and others are empty.

On the side of the comet facing the sun, ice changes to water vapor. Jets of water vapor with dust particles spray from the comet. Near the sun, several tons of gas and dust are emitted each second in the jets.

1. Why do we have new information about Comet Halley? _____

2. What countries sent space probes? _____

3. What is the shape of the nucleus? _____
4. Calculate the volume of the nucleus. _____
5. What and where are the jets? _____

6. Name an object with the same diameter or a distance equal to the diameter of a crater on Halley's nucleus. _____

7. Describe what you think you would see if you could stand on the sunward side of Comet Halley.

