

**This is the first part of the student text is called  
“Comets—What are They?”**

**Comets are remnants from the cold, outer regions of the solar nebula, the gaseous cloud from which our Solar System is believed to have formed.**

**Billions of these icy bodies are found in the Oort cloud, which is near the edge of the Solar System. It is between five thousand and one hundred thousand astronomical units from Earth.**

**Other comets are found in the Kuiper belt, which is only about fifty astronomical units from the Earth. Use Tactile Card 1 to observe the location of the Kuiper belt in the outer Solar System.**

**Find the card number, either in print or in Braille, in the upper left corner.**

**From the card number move your left pointer finger to the right. Find the open circle starting point in the middle of the top of the card.**

**Place another finger of your left hand on the edge of the card to help your pointer finger travel straight down from the starting dot.**

**Move your fingers down until your pointer finger finds the solid oval in the middle of the image.**

**This oval represents not only the sun but also the inner Solar System including the planets Mercury, Venus, Earth, and Mars.**

**Moving out in any direction from this solid oval you will find some concentric solid lines.**

**The first of these lines represents the oval orbit of Solar System's largest planet, Jupiter. Move your finger around the orbit of Jupiter.**

**Now move your finger outward to the next solid oval line. It represents the orbit of the ringed planet Saturn.**

**Continue moving outward to the orbit of Uranus, the next planet.**

**Move your finger around Uranus' complete orbit. Uranus was discovered in seventeen hundred eighty one.**

**It's orbit is so large that it takes Uranus eighty-four Earth years to orbit the sun.**

**The outermost solid line in our Solar System is the orbit of Neptune. The Voyager Two flew by Neptune in August of nineteen eighty-nine.**

**As you move your finger around Neptune's orbit, try to locate a dashed line. Follow this new orbit.**

**This dashed line represents the orbit of the dwarf planet Pluto which was discovered by Clyde Tombaugh in the year nineteen thirty.**

**Finally, observe the textured area that surrounds the dashed orbit of Pluto. It is a disc shaped region starting beyond the orbit of Neptune.**

**This area, which surrounds the Solar System, represents the Kuiper belt.**

**Thousands of icy bodies including comets orbit the sun in this region of the Solar System. They are called Kuiper belt objects or Trans Neptunian objects.**

**This is the second part of the student text is called  
“Comets—What are They?”**

**Comets are made of ices, dust and rocky debris from the early formation of the Solar System four and a half billion years ago.**

**Rather than being a solid ice cube, comets may be made of many smaller ice crystals with organic molecules mixed in.**

**Comets orbit around the Sun as do the planets. Use Tactile Card two to follow this description of comet orbits.**

**Find the card number, either in print or in Braille, in the upper left corner.**

**From the card number move your left pointer finger to the right. Find the open circle starting point in the middle of the top of the card.**

**Place another finger of your left hand on the edge of the card to help your pointer finger travel straight down from the starting dot.**

**Move your fingers down until your pointer finger finds the large filled circle in the middle of the graphic. This represents the Sun.**

**Comet orbits are elliptical. Move your finger to the dashed line to right of the Sun.**

**Track that dashed line back to and around the Sun to feel the elliptical shape of the comet's orbit.**

**Now move your finger past the dashed line to the solid line. Track that line to feel the shape of Earth's orbit. Earth is one of the solar planets.**

**How is the shape of Earth's orbit different from the shape of a comet's orbit?**

**The Earth stays about the same distance away from the Sun as it moves around the Sun.**

**A comet's orbit brings it close to the sun and takes it far away.**

**If you did not feel the difference, try again.**

**Comets that orbit the Sun every twenty years or less are called short period comets. Long period comets orbit the Sun every two hundred years or longer.**

**Those comets with orbits between twenty and two hundred years are called Halley-type comets. Comet Tempel One, the target of the Deep Impact**

**Discovery Mission, has a period of five and a half years.**

**Like the planets, comets also rotate on an axis. Comet Tempel One takes almost forty-one hours for one rotation.**