APPENDIX ACTIVITY 1:
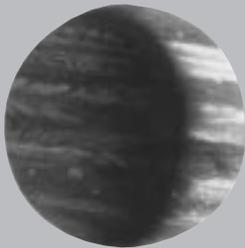# MAKE SCALE MODELS OF THE PLANETS

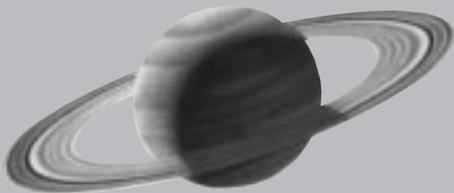## THE PLANETS & THEIR REALITIVE SIZES

Mercury

Venus

Earth

Mars

Jupiter

Saturn

Uranus

Neptune

Pluto

For a long time, people thought that the Earth was the center of the Universe, with the Sun, Moon, stars and planets circling around the Earth. This idea made complete sense based on what people saw when they looked up at the sky.

Today we know that the Earth is not the center of everything. The Universe is incredibly huge, with many more stars than we can see at night. Our Sun is just one of those stars, although it certainly is the most important one for us.

Earth and Mars are both planets which go around the Sun. There are a total of nine planets in our Solar System.

Though all nine planets are the same shape — roughly spherical — they vary considerably in their sizes. Looking at them in the sky is no real help in comprehending their sizes because, at great distances, even the giant planets appear as dots. In this activity, you will make models of the planets, in order to compare their sizes.

How Do the Planets Compare in Size?

Materials: *paper, scissors, pen or pencil, drawing compass, ruler*

At the right is a table called "Sizes of the Planets." For each planet, it shows the actual diameter in kilometers. It also shows how to create scale models that are one billion times smaller than the real planets.

1 To make two-dimensional paper models of each planet, find the "scaled diameter" column. Start with the Earth. Earth's real diameter is 12,800 km. The "scaled diameter," at one billionth reduction, is 1.3 cm (actually it is 1.28 cm, but it is rounded off to the nearest tenth of a centimeter). Use a compass to draw a circle that is 1.3 cm in diameter and cut it out with scissors. This circle represents Earth.

2 Repeat Step 1 with the other planets. For each planet, cut out a circle that is the "scaled diameter." Label each planet with its name and diameter. *(Mercury and Pluto will be too small to label).*

3 After you cut out all the planets, glue or tape them into your journal. One student in the class should set aside the paper planets and not glue them to his or her journal. You will need them for the next activity.

4 Finally, make a scale model of the Sun. Tape several pages of newspaper together and cut out a circle that is 139 centimeters in diameter. Label it "Sun."

5 Discuss in class or write in your journal:
- How do the planets compare in size?
- Which planet is the largest? Smallest?
- Which is most nearly the size of Earth?
- Is Mars larger or smaller than Earth?
- What surprised you most about this activity?

Sizes of the Planets

Planet	Actual Diameter	Scaled Diameter
Mercury	4,880 km	0.5 cm
Venus	12,100 km	1.2 cm
Earth	12,800 km	1.3 cm
Mars	6,800 km	0.7 cm
Jupiter	142,000 km	14.2 cm
Saturn	120,000 km	12.0 cm
Uranus	51,200 km	5.1 cm
Neptune	48,600 km	4.9 cm
Pluto	2,200 km	0.2 cm
Sun	1,392,000 km	139.2 cm

Scaled diameter is 1 billionth of actual size