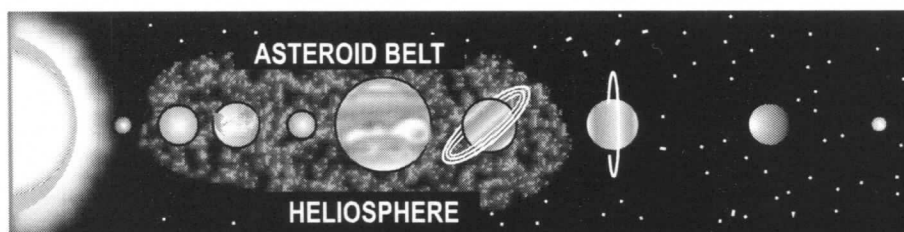


Unit 3: Facts About the Planets

Student Information

The position of the planets in the solar system causes them to have unique physical features. The first four planets in the solar system, Mercury, Venus, Earth, and Mars, are referred to as the **inner belt**, or **terrestrial**, planets. The inner belt of planets is separated from the outer belt of planets by the asteroid belt.

The **outer belt** includes the **Jovian** planets: Jupiter, Saturn, Uranus, and Neptune. They are different from the terrestrial planets in that they have no solid surface. These large gas giants are surrounded by gaseous clouds that get thicker closer to the center of the planet.



Inner Planets (Terrestrial Planets)

MERCURY

First planet in the solar system

Special Fact: Mercury rotates very slowly. It takes almost 59 Earth-days to rotate once.

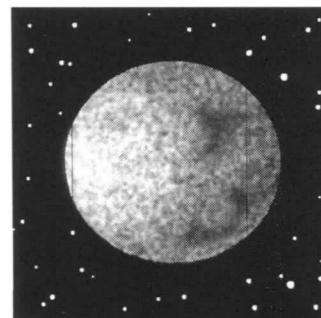
Diameter: 3,031 miles (4,878 km)

Average distance from the sun: 36 million miles (58 million km)

Rotation: 58.7 Earth-days

Orbit of the sun: 88 Earth-days

Moons: None



VENUS

Second planet in the solar system

Special Fact: Venus has a thick atmosphere with crushing pressure. The clouds are made up of tiny droplets of acid.

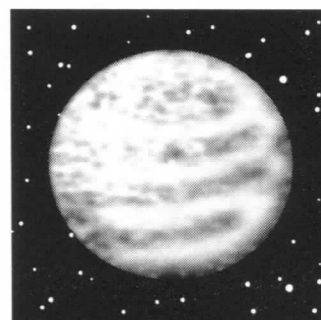
Diameter: 7,521 miles (12,104 km)

Average distance from the sun: 67.2 million miles (108.2 million km)

Rotation: 243 Earth-days

Orbit of the sun: 224.7 Earth-days

Moons: None



EARTH

Third planet in the solar system

Special Fact: Earth is the only planet covered in water. Water makes life on this planet possible. Earth is tilted on its axis 23.5 degrees and therefore has seasons.

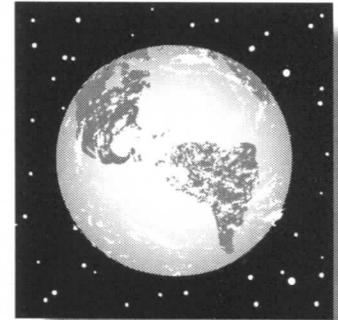
Diameter: 7,926 miles (12,756 km)

Average distance from the sun: 93 million miles (150 million km)

Rotation: 23 hours, 56 minutes

Orbit of the sun: 365.25 days

Moons: 1

**MARS**

Fourth planet in the solar system

Special Fact: Mars is tilted on its axis 24 degrees, similar to Earth, and therefore has seasons.

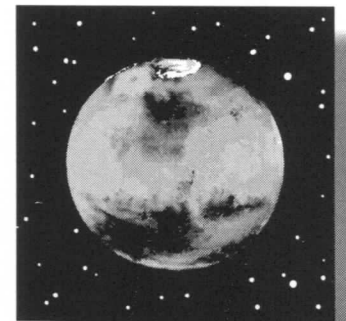
Diameter: 4,220 miles (6,974 km)

Average distance from the sun: 142 million miles (228 million km)

Rotation: 24 hours, 37 minutes

Orbit of the sun: 687 Earth-days

Moons: 2 (Phobos and Deimos)

**Outer Planets (Jovian Planets)****JUPITER**

Fifth planet in the solar system

Special Fact: Jupiter is the largest planet. It is large enough to contain 1,000 bodies the size of Earth.

Diameter: 88,400 miles (142,000 km)

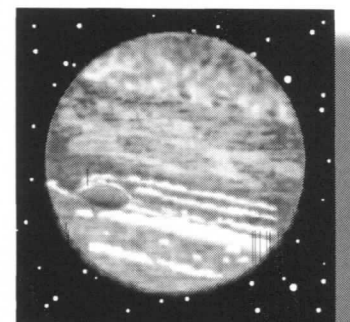
Average distance from the sun: 484 million miles (630 million km)

Rotation: 9 hours, 50 minutes (Jupiter rotates faster than any other planet)

Orbit of the sun: 11.9 Earth-years

Moons: 62 known; Four of Jupiter's Moons can be observed with binoculars. They are referred to as the Galilean moons and are Io, Europa, Ganymede, and Callisto.

Rings: 3



SATURN

Sixth planet in the solar system

Special Fact: Saturn is known as the ringed planet. Scientists now know that Jupiter, Uranus, and Neptune also have rings.

Diameter: 74,600 miles (120,000 km)

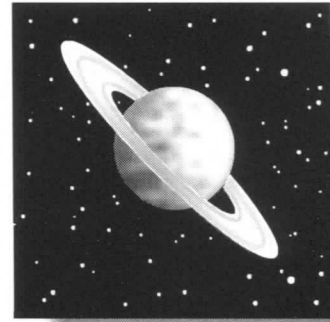
Average distance from the sun: 887 million miles (1,430 million km)

Rotation: 10 hours, 39 minutes

Orbit of the sun: 29.5 Earth-years

Moons: 60 known

Rings: Thousands

**URANUS**

Seventh planet in the solar system

Special Fact: Uranus rotates on an axis that is almost tilted on its side. Sometimes its poles point directly at the sun.

Diameter: 31,700 miles (51,100 km)

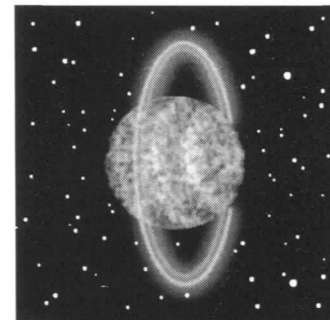
Average distance from the sun: 1,784 million miles (2,871 million km)

Rotation: 17 hours, 14 minutes

Orbit of the sun: 84 Earth-years

Moons: 27 known

Rings: 13

**NEPTUNE**

Eighth planet in the solar system

Special Fact: Neptune rotates on a nearly upright axis.

Diameter: 30,800 miles (49,500 km)

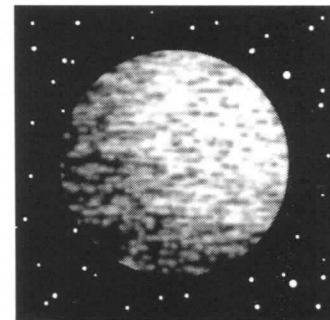
Average distance from the sun: 2,794 million miles (4,498 million km)

Rotation: 16 hours, 7 minutes

Orbit of the sun: 163.7 Earth-years

Moons: 13 known

Rings: 9

**PLUTO (dwarf planet)**

Ninth planet in the solar system

Special Fact: Pluto was once considered the most distant planet of our solar system. In 2006, because of its small size and eccentric orbit, the International Astronomical Union (IAU) formally reclassified it as a dwarf planet.

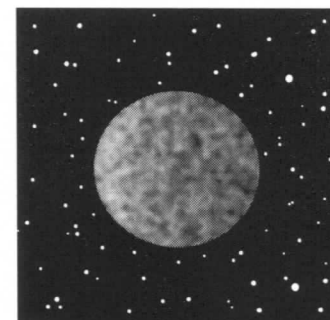
Diameter: 1,484 (2,390 km)

Average distance from the sun: 3,700 million miles (5,900 million km)

Rotation: 6 days, 9 hours, 36 minutes

Orbit of the sun: 248 Earth-years

Moons: 3 known



Name: _____ Date: _____

Sizes and Distances in Our Solar System



At 750 miles per hour, a plane can fly from coast to coast in about four hours. Not bad! It would take that same plane fourteen years to fly the 93,000,000 miles (149,600,000 km) from Earth to the sun (certainly running out of peanuts and soda pop in the process). Besides, it's difficult to deal with millions of anything! For distances within and beyond our solar system, two other units of measure are useful: the **astronomical unit (AU)** and the **light-year**.

One AU is the distance from Earth to the sun. Thus, our planetary neighbor Mars is 1.52 AU from the sun, while distant Pluto is 39.4 AU from the sun. (You could fly there in just 552 years on your favorite air carrier.) The distance of the various planets from the sun (and other statistics) are given in the "Planetary Fast Facts" table below.

A light-year is the distance light travels in one year, zipping along at 186,000 miles (300,000 kilometers) per second.

PLANETARY FAST FACTS						
Planet	Year	# of Moons	Diameter (km)	Rotation	Mass	# of AU's from sun
Mercury	88 days	0	4,880	59 days	0.55E	0.39
Venus	226 days	0	12,104	243 days	0.8E	0.72
Earth	365.2 days	1	12,756	23.9 hours	1*	1.0
Mars	687 days	2	6,794	24.6 hours	0.1E	1.52
Jupiter	11.9 years	63	142,984	9.9 hours	318E	5.20
Saturn	29.5 years	31	120,536	10.7 hours	95E	9.54
Uranus	84 years	27	51,118	17.3 hours	14.5E	19.18
Neptune	165 years	13	49,532	16.1 hours	17.1E	30.06
Pluto	148 years	1	2,484	6.4 days	0.002E	39.44

* Masses are given in fractions or multiples of Earth's mass, which is 6×10^{21} metric tons.
Sun statistics: The sun rotates in 25 days (at the equator); its diameter is 1,390,000 km; and its mass is 333,000 times that of Earth. It has a temperature of 15 million°C at the core, but only 5,500°C at the surface.

To get a picture in your mind of the relative distances of the planets from the sun, let's think football fields, which are a hundred yards long. One AU is going to equal 2.54 yards (100 divided by 39.44 AU, the distance to Pluto). Assume that the sun burns at one goal line. Mercury will orbit less than half a yard from the sun; Venus will be about three-fourths of a yard away. Earth, of course, is on the two-and-a-half yard line. Jupiter lies just over the 13-yard mark (2.54 yards/AU x 5.2 AU).



1. Using the table above, calculate how many yards down the field each of these planets will be found. Saturn _____ Uranus _____ Neptune _____
2. Jupiter's diameter is 142,984 km (see the table above). Let that diameter equal 90 mm and, on your own paper, draw all nine planets in the solar system to the same scale. (Hint: Divide 142,984 by 90 to find out how many kilometers are represented by each millimeter.)

Name: _____ Date: _____

Quick Check

Matching

- | | |
|------------------|-------------------------------------|
| _____ 1. Neptune | a. first planet in the solar system |
| _____ 2. Mercury | b. tilted on its axis 24 degrees |
| _____ 3. Saturn | c. largest planet |
| _____ 4. Jupiter | d. planet with the most rings |
| _____ 5. Mars | e. has 13 known moons |

Fill in the Blanks

- The outer belt includes the _____ planets.
- The inner belt of planets is separated from the outer belt of planets by the _____.
- Venus has a thick atmosphere with crushing _____.
- The first four planets in the solar system are referred to as the _____, or _____, planets.
- Four of _____ moons can be observed with binoculars. They are referred to as the _____ moons.

Multiple Choice

- It takes almost 59 Earth-days for this planet to rotate once on its axis.
a. Neptune b. Venus c. Mercury d. Uranus
- Which of the following is **not** a terrestrial planet?
a. Saturn b. Mercury c. Venus d. Earth
- Sometimes this planet's poles point directly at the sun.
a. Pluto b. Uranus c. Mars d. Jupiter
- The clouds of this planet are made up of tiny droplets of acid.
a. Mercury b. Pluto c. Uranus d. Venus