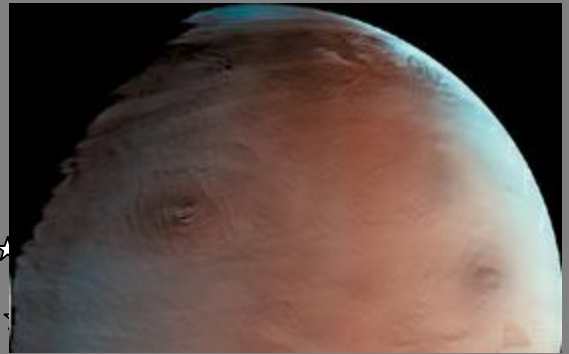


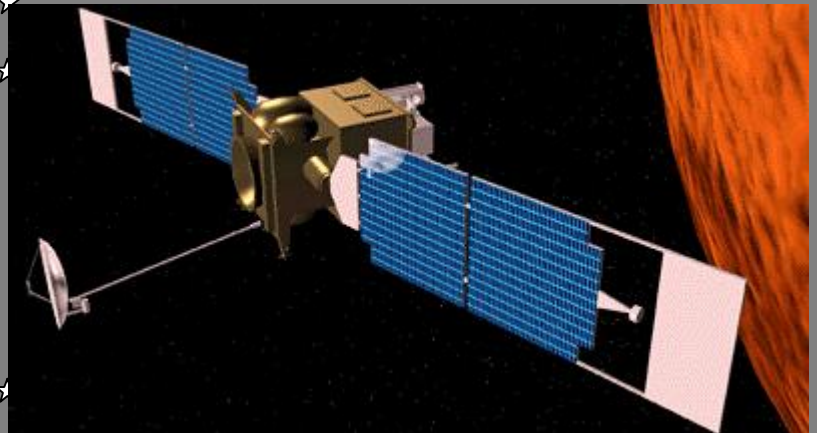
Mars and Beyond!



Mars taken by Mars Orbital Camera



Family Portrait of Jupiter's Great Red Spot and the Galilean Satellites



Mars Global Surveyor

By Nancy Wilkinson

Mars and Beyond
Lesson 10
The Planets and Their Distance from the Sun

Objective:

- 1) Students will compare the distance of the planets to the Sun.
- 2) Students will measure the distance of the planets based on a comparative measurement.

Materials Needed:

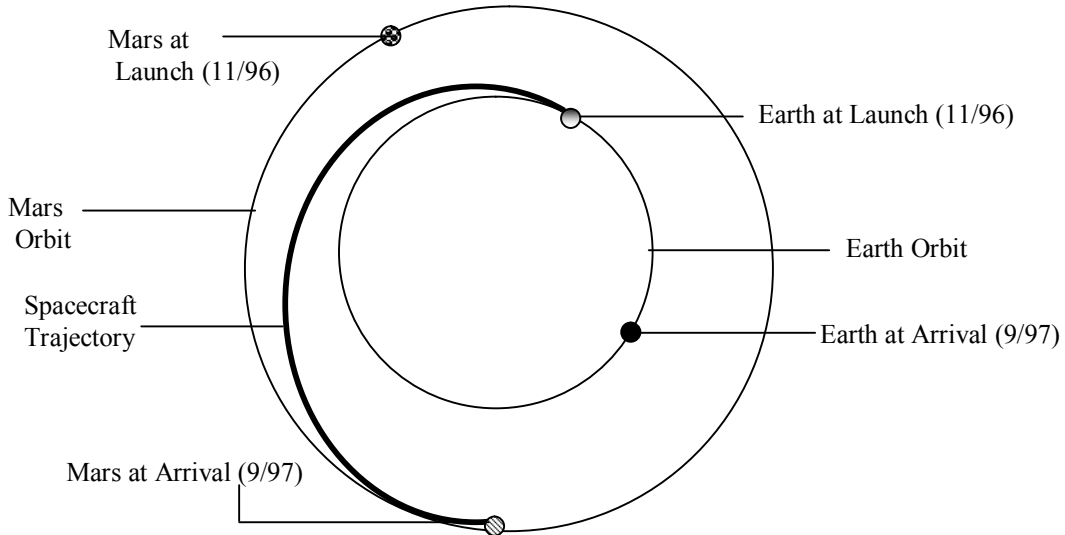
- 1) Rulers and yard sticks
- 2) Worksheet Lesson 10 (To save on copying costs, students can copy the chart on their own paper).

Opening Activity:

Read the following excerpt to the students:

The Mars Global Surveyor (MGS) took 10 months to get to Mars. It traveled 770 million kilometers. Mars is only 56 million kilometers from the planet Earth. Why do you think it traveled so much further than the actual distance?

Due to the revolution of the planets earth and Mars, M.G.S. had to travel further. It did not make a straight line towards Mars.



Activity:

- 1) Draw a large circle on the chalkboard and label it Sun.
- 2) Tell the students that the Earth's distance from the Sun is 150,000,000 kilometers. If we place the Earth only one inch away from the Sun, how far away from the Sun would be the other planets? To calculate this, we create a proportion.

$$\frac{\text{Earth's Distance from the Sun}}{1 \text{ inch}} \longrightarrow \frac{150000000}{1} = \frac{\text{Planet's Distance From the Sun}}{X}$$

- 3) Explain by solving a proportion, we cross multiply. To do this, we multiply 1 by the planets distance from the Sun. This is equal to 150,000,000 times X. Since anything multiplied by 1 is that number, our equation would be:

$$150,000,000X = \text{Planet's distance from the Sun}$$

This is solved for X by dividing the Planet's distance from the Sun by 150,000,000. Have the students complete the chart on Worksheet Lesson 10.

- 4) Mark the distance of the planets in your classroom placing the Earth one-inch from the "Sun."

Closure

Using the information from the chart, plot the planet distance on the playground. Instead of one inch, use one foot.



Mars Pathfinder impacted the surface on July 4, 1997. The last attempt to contact Mars Pathfinder ended unsuccessfully on 10 March 1998 and the mission was officially declared to be over.

Mars and Beyond
Worksheet Lesson 10
The Planets and Their Distance from the Sun

Name _____ Period _____

Directions: The Earth's distance from the Sun is 150,000,000 kilometers. If we place the Earth only one inch away from the Sun, how far away from the Sun would be the other planets? To calculate this, we create a proportion.

$$\frac{\text{Earth's Distance from the Sun}}{1 \text{ inch}} = \frac{150000000}{1} = \frac{\text{Planet's Distance From the Sun}}{X}$$

By solving a proportion, we cross multiply. To do this, we multiply 1 by the planets distance from the Sun. This is equal to 150,000,000 times X. Since anything multiplied by 1 is that number, our equation would be:

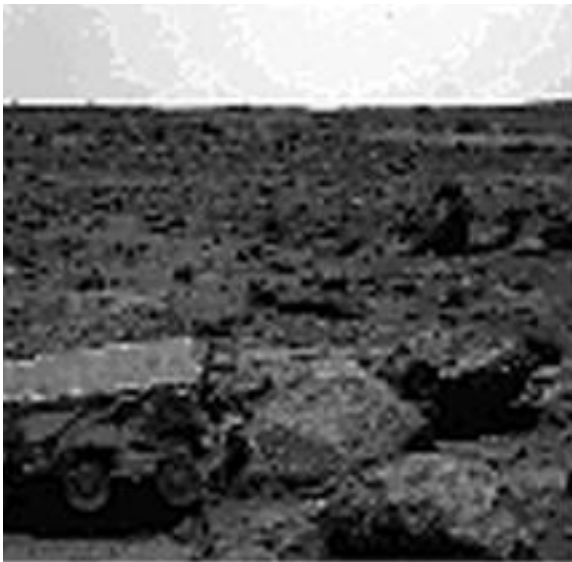
$$150,000,000X = \text{Planet's distance from the Sun}$$

This is solved for X by dividing the Planet's distance from the Sun by 150,000,000. Complete the chart below.

Planet	Distance from the Sun - kilometers	Distance if the Earth were One Inch Away from the Sun
Mercury	58,000,000	
Venus	108,000,000	
Earth	150,000,000	
Mars	228,000,000	
Jupiter	778,000,000	
Saturn	1,427,000,000	
Uranus	2,870,000,000	
Neptune	4,497,000,000	
Pluto	5,900,000,000	

Mars and Beyond
Worksheet Lesson 10 - Answers
The Planets and Their Distance from the Sun

Planet	Distance from the Sun - kilometers	Distance if the Earth were One Inch Away from the Sun
Mercury	58,000,000	≈ .38 inches
Venus	108,000,000	≈ .72 inches
Earth	150,000,000	1 inch
Mars	228,000,000	≈ 1.52 inches
Jupiter	778,000,000	≈ 5.19 inches
Saturn	1,427,000,000	≈ 9.51 inches
Uranus	2,870,000,000	≈ 19.13 inches
Neptune	4,497,000,000	≈ 29.98 inches
Pluto	5,900,000,000	≈ 39.33 inches



Rover and APXS deployed on "Moe"

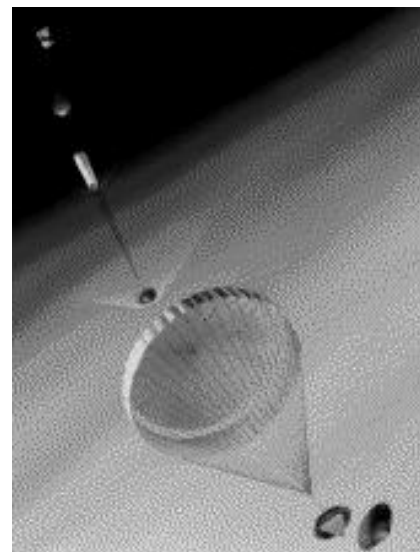


Image of Mars Pathfinder in Mars Atmosphere