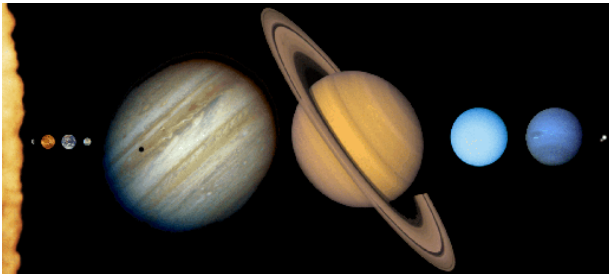


Mars as a Solar System Body

Physical Properties and Composition

By: Elisabeth Ambrose



The Solar System. NASA/JPL.

This picture depicts the correct relative sizes of the 9 planets of the Solar System in the correct order. The planets are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto. Mars is the fourth planet from the Sun. It is one of the four inner planets. Mars orbits at a distance of 1.52 Astronomical Units (227,940,000 km) from the Sun. One Astronomical Unit is equal to 1.496×10^8 km, the average distance from the Earth to the Sun. Astronomical Units are abbreviated A.U. Its orbit is situated

between those of Earth and the Asteroid Belt.

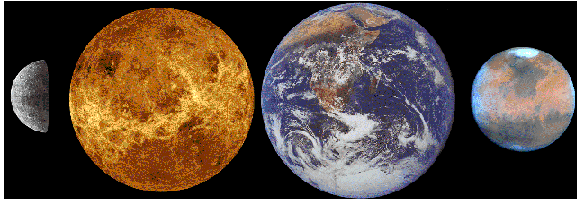


Sun and planets. NASA/JPL.

This picture depicts the four gas giant planets (Jupiter, Saturn, Uranus, and Neptune), Earth, and the Sun. Earth is the tiny dot between Jupiter and the Sun. The relative sizes of the objects are to scale, with 3200 km corresponding to one pixel of the image.

If the relative sizes of the planets were shrunk to be one billionth of its actual size, the Earth would be the size

of a large marble (2 cm diameter), Mars would be the size of a pea (1 cm diameter), Jupiter would be the size of a grapefruit, Saturn would be the size of an orange, Uranus and Neptune would each be the size of lemons, and the Sun would be the size of a tall man.



The relative sizes of the Mercury, Venus, Earth, and Mars. NASA/JPL.

While it is easy to compare the relative sizes of the planets in an image, it is more difficult to compare their relative distances from the Sun. If the Solar System was shrunk to one billionth of its actual size, the Moon would be about 30 centimeters away from the Earth. The Sun would be 150 meters (one and a half

football fields) away from the Earth. Mars would be 325 meters away (three football fields), Jupiter would be 750 meters away (5 city blocks), Saturn would be 1500 meters away (10 city blocks), and the nearest star would be more than 40,000 km away

From the Earth, Mars looks like a big, reddish star. A somewhat closer view as in this image taken as the Mars Climate Orbiter was approaching the planet, shows the brightly lit side of Mars that is facing the Sun. (twice the circumference of the Earth!)

The Benchmark Lessons were developed with the help of the following sources:

Bill Arnet's "The Nine Planets" website, <http://nineplanets.org>

Chaisson, Eric, and McMillan, Steve. *Astronomy Today*. Prentice Hall, Upper Saddle River, New Jersey, 1999.

JPL's Planetary Photojournal, <http://photojournal.jpl.nasa.gov/>

The NASA Image Exchange, <http://nix.nasa.gov/>

Zeilik, Michael, Gregory, Stephen A., and Smith, Elske v. P. *Introductory Astronomy and Astrophysics*. Saunders College Publishing, Harcourt Brace Jovanovich College Publishers, Austin, 1992.

Mission to Mars: Project Based Learning: Dr. Anthony Petrosino, Department of Curriculum and Instruction,
College of Education, University of Texas at Austin,
<http://www.edb.utexas.edu/missiontomars/index.html>
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