

More about Planets and Dwarf Planets^[1]

Planet or Dwarf Planet (d)	Rotation Period (days)	Orbit Period (days)	Orbit Period (years)	Orbital Velocity (miles/hour)	Number of Equivalent Earths (on volume)	Moons (#)
Mercury	58.60	87.90	0.24	107,082	0.06	0
Venus	242.90	224.70	.062	78,337	0.86	0
Earth	1.00	365.20	1.00	66,616	1.00	1
Mars	1.03	687.00	1.88	53,977	0.15	2
Ceres (d)	0.38	1680.10	4.60	40,001	0.0004	0
Jupiter	0.41	4,330.6	11.86	29,237	1388.26	63
Saturn	0.45	10,746.90	29.42	21,676	843.74	61
Uranus	0.72	30,588.70	83.75	15,234	64.35	27
Neptune	0.68	59,799.90	163.73	12,147	58.53	13
Pluto (d)	6.39	90,579.52	248.00	10,558	0.0060	3
Haumea	0.16	103,468.00	283.28	10,330	0.0059	2
Makemake	Unknown	113,183.00	309.88	9,885	0.0016	0
Eris (d)	0.33	203438.7	557.00	7,686	0.0085	1

Our Sun, Our Star...

Composition =	70% hydrogen, 28% helium, 2% other	Mass =	2x10 ³⁰ kg
Diameter =	1,390,480 km or 864,000 miles	Surface Temperature =	5,800 K or 9,980 F
Rotation Period =	27 to 31 days, depends on latitude	Core Temperature =	15,000,000 K or 26,999,540 F
# of Equivalent Earths (volume) =	1,295,240	Luminosity =	3.8 x 10 ²⁶ watts

Why do they change?***

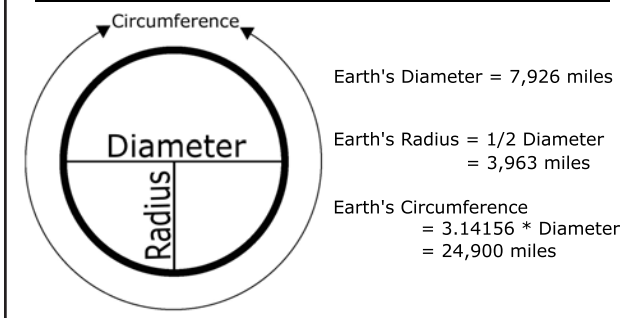
When:	Neptune Position from Sun	Pluto Position from Sun	Eris Position from Sun
1995	9th	8th	10th
Now	8th	9th	10th
800 years from now	9th	10th	8th

*** Because of the elliptical orbits of Pluto and Eris.

km and miles:

mile = 0.621371 X km
km = mile / 0.621371

Measuring planets, moons, etc.



Tessmann Planetarium

Student Reference

Santa Ana College's
Randall G. Smith
Space Education Center

"The mind is not a vessel to be filled, but a fire to be ignited."
- Plutarch"

About our universe...

Our Solar System's Planets^[1] & Dwarf Planets^[1]

Planet or Dwarf Planet (d)	Ring Seg (#)	Mean Distance From Sun (kilometers)	Mean Distance from Sun (miles)	Diameter (miles)	Mean Distance from Sun (AUs*)	Namesake
Mercury	0	57,800,000	35,915,000	3,031	0.4	Messenger of the Roman Gods
Venus	0	108,200,000	67,232,000	7,526	0.7	Roman Goddess of Love and Beauty
Earth	0	149,600,000	92,956,000	7,926	1.0	Origin: A German word for land or soil
Mars	0	222,500,000	138,255,000	4,217	1.5	Roman God of War
Ceres (d)	0	413,793,600	257,116,300	605	2.8	Roman Goddess of Growing Plants and Motherly Love
Jupiter	1	778,300,000	483,612,000	88,421	5.2	King of the Roman Gods
Saturn	9	1,429,400,000	888,186,000	74,897	9.6	Roman God of Agriculture, Jupiter's Father
Uranus	11	2,871,000,000	1,783,953,000	31,763	19.2	Roman God, Saturn's Father
Neptune	4	4,501,200,000	2,796,910,000	30,775	30.1	Roman God of the Sea, Jupiter's Brother
Pluto (d)	0	5,869,660,000	3,647,238,000	1,442	39.2	Roman God of the Underworld
Haumea (d)	0	6,500,000,000	4,038,912,800	1,429	43.4	The Hawaiian Goddess of Childbirth
Makemake (d)	0	6,850,000,000	4,256,392,700	932	45.8	Creator of Humanity and God of Fertility of ancient Easter Islanders
Eris (d)	0	10,120,000,000	6,288,276,000	1,616	67.6	Greek Goddess of Strife and Chaos

* 1 AU = 1 Astronomical Unit = Mean Distance Earth to Sun = 92,956,000 miles = 149,600,000 km.

Some Solar System Objects and Discoverers

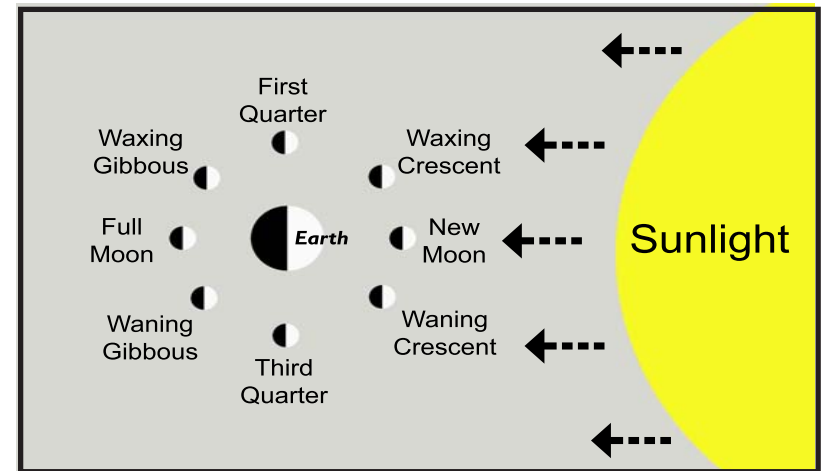
Object	Type	Discovered by:
Mercury, Venus, Mars, Jupiter, Saturn	Planet	Unknown, only planets visible to the unassisted eye, discovery was prehistoric
Earth	Planet	Not Applicable
Ceres (d) ^[1]	Dwarf Planet	Giuseppe Piazzi, 1801
Asteroid Belt	Asteroid	First discovered was Ceres; many Small Mass Objects orbiting between the orbits of Mars and Jupiter.
Uranus	Planet	William Herschel, March 13, 1781
Neptune	Planet	First seen: Hohann Gottfried Galle, September 23, 1846; predicted by John Couch Adams, 1843 and Leverrier, 1846.
Pluto (d) ^[1]	Dwarf Planet ^[1]	Clyde Tombaugh, February 18, 1930
Haumea (d) (2003EL ₆₁) ^[1]	Dwarf Planet ⁽¹⁾	Ortiz et al., Michael Brown et al. December 23, 2004 See Tessmann Position Paper referenced in Footnote
Makemake ^[1] (d) (2005FY ₉)	Dwarf Planet ⁽¹⁾	Michael Brown, March 31, 2005
Eris (d) ^[1]	Dwarf Planet ^[1]	Chad Trujillo, Michael Brown and David Rabinowitz, October 21, 2003
Quaoar ^[1]	First KBO Found Possible Dwarf Planet ⁽¹⁾	Chad Trujillo, Michael Brown, June 4, 2002, See Tessmann Position Paper referenced in Footnote
Sedna ^[1]	First Potential Oort Cloud Object Possible Dwarf Planet ⁽¹⁾	Chad Truillo, Michael Brown, June 4 2002, See Tessmann Position Paper referenced in Footnote
Kuiper Belt (KBO)	Comets, Asteroids and other Small Mass Objects	Suggested by Frederick C. Leonard in 1930; Proposed by Kenneth Edgeworth in 1943; Predicted by Gerard Kuiper in 1950; sometimes called the Edgeworth-Kuiper Belt.
Oort Cloud	Comets, Asteroids and other Small Mass Objects	Proposed in 1932 by Ernst Opik; predicted by Jan Oort in 1950 based on comet calculations.

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Newton's Laws of Motion

1. A body tends to keep moving in a straight line and a stationary body tends to stay put unless it is compelled to change because of some force, also known as the Law of Inertia.
2. A force acting on a body will change the momentum of the body in the direction of the applied force.
3. For every action, there is an equal and opposite reaction.

Phases of our Moon



Footnote:

Tessmann Position on Planet Definitions

[1] New definitions of a planet were voted into existence on 8-24-2006 by the International Astronomical Society. This version of the Student Reference reflects this change where we now have planets and dwarf planets. It is the considered opinion of the Tessmann Planetarium that the IAU definitions will change again amid controversy. The Tessmann Planetarium position is that the IAU definitions need significant refinement. See our website for a position paper on this subject www.sac.edu click on Planetarium, then click on the question.

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