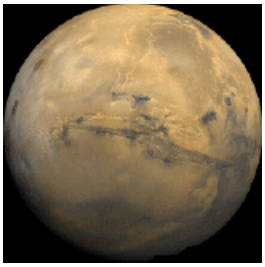
Mars Fact Sheet



Mars/Earth Comparison

Bulk parameters

	Mars	Earth	Ratio (Mars/Earth)
Mass (10^{24} kg)	0.64174	5.9726	0.107
Volume (10^{10} km^3)	16.318	108.321	0.151
Equatorial radius (km)	3396.2	6378.1	0.532
Polar radius (km)	3376.2	6356.8	0.531
Volumetric mean radius (km)	3389.5	6371.0	0.532
Core radius (km)	1700	3485	0.488
Ellipticity (Flattening)	0.00589	0.00335	1.76
Mean density (kg/m^3)	3933	5514	0.713
Surface gravity (m/s^2)	3.71	9.80	0.379
Surface acceleration (m/s^2)	3.69	9.78	0.377
Escape velocity (km/s)	5.03	11.19	0.450
GM (x 10^6 km^3/s^2)	0.04283	0.3986	0.107
Bond albedo	0.250	0.306	0.817
Visual geometric albedo	0.170	0.367	0.463
Visual magnitude V(1,0)	-1.52	-3.86	-
Solar irradiance (W/m^2)	589.2	1367.6	0.431
Black-body temperature (K)	210.1	254.3	0.826
Topographic range (km)	30	20	1.500
Moment of inertia (I/MR^2)	0.366	0.3308	1.106
J_2 (x 10^{-6})	1960.45	1082.63	1.811
Number of natural satellites	2	1	
Planetary ring system	No	No	

Orbital parameters

	Mars	Earth	Ratio (Mars/Earth)
Semimajor axis (10^6 km)	227.92	149.60	1.524
Sidereal orbit period (days)	686.980	365.256	1.881
Tropical orbit period (days)	686.973	365.242	1.881
Perihelion (10^6 km)	206.62	147.09	1.405
Aphelion (10^6 km)	249.23	152.10	1.639
Synodic period (days)	779.94	-	-
Mean orbital velocity (km/s)	24.07	29.78	0.808
Max. orbital velocity (km/s)	26.50	30.29	0.875
Min. orbital velocity (km/s)	21.97	29.29	0.750
Orbit inclination (deg)	1.850	0.000	-
Orbit eccentricity	0.0935	0.0167	5.599
Sidereal rotation period (hrs)	24.6229	23.9345	1.029
Length of day (hrs)	24.6597	24.0000	1.027
Obliquity to orbit (deg)	25.19	23.44	1.075
Inclination of equator (deg)	25.19	23.44	1.075

Mars Observational Parameters

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Discoverer:      Unknown
Discovery Date:  Prehistoric

Distance from Earth
        Minimum (10^6 km)           55.7
        Maximum (10^6 km)          401.3
Apparent diameter from Earth
        Maximum (seconds of arc)   25.1
        Minimum (seconds of arc)    3.5
Mean values at opposition from Earth
        Distance from Earth (10^6 km)         78.39
        Apparent diameter (seconds of arc)    17.9
        Apparent visual magnitude             -2.0
Maximum apparent visual magnitude             -2.91
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Mars Mean Orbital Elements (J2000)

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Semimajor axis (AU)                  1.52366231
Orbital eccentricity                 0.09341233
Orbital inclination (deg)            1.85061
Longitude of ascending node (deg)   49.57854
Longitude of perihelion (deg)      336.04084
Mean Longitude (deg)               355.45332
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North Pole of Rotation

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Right Ascension: 317.681 - 0.106T
Declination    :  52.887 - 0.061T
Reference Date : 12:00 UT 1 Jan 2000 (JD 2451545.0)
T = Julian centuries from reference date
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Martian Atmosphere

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Surface pressure:  6.36 mb at mean radius (variable from 4.0 to 8.7 mb depending on season)
                   [6.9 mb to 9 mb (Viking 1 Lander site)]
Surface density: ~0.020 kg/m^3
Scale height:  11.1 km
Total mass of atmosphere: ~2.5 x 10^16 kg
Average temperature:  ~210 K (-63 C)
Diurnal temperature range: 184 K to 242 K (-89 to -31 C) (Viking 1 Lander site)
Wind speeds:  2-7 m/s (summer), 5-10 m/s (fall), 17-30 m/s (dust storm) (Viking Lander sites)
Mean molecular weight: 43.34
Atmospheric composition (by volume):
    Major      : Carbon Dioxide (CO2) - 95.32% ; Nitrogen (N2) - 2.7%
                 Argon (Ar) - 1.6%; Oxygen (O2) - 0.13%; Carbon Monoxide (CO) - 0.08%
    Minor (ppm): Water (H2O) - 210; Nitrogen Oxide (NO) - 100; Neon (Ne) - 2.5;
                 Hydrogen-Deuterium-Oxygen (HDO) - 0.85; Krypton (Kr) - 0.3;
                 Xenon (Xe) - 0.08
```

Satellites of Mars

	Phobos	Deimos
Semi-major axis* (km)	9378	23459
Sidereal orbit period (days)	0.31891	1.26244
Sidereal rotation period (days)	0.31891	1.26244
Orbital inclination (deg)	1.08	1.79
Orbital eccentricity	0.0151	0.0005
Major axis radius (km)	13.4	7.5
Median axis radius (km)	11.2	6.1
Minor axis radius (km)	9.2	5.2
Mass (10^{15} kg)	10.6	2.4
Mean density (kg/m^3)	1900	1750
Geometric albedo	0.07	0.08
Visual magnitude V(1,0)	+11.8	+12.89
Apparent visual magnitude (V_0)	11.3	12.40

*Mean orbital distance from the center of Mars.

Notes on the factsheets - definitions of parameters, units, notes on sub- and superscripts, etc.

Planetary Fact Table - metric units
Planetary Fact Table - U.S. units
Planetary Fact Table - Earth ratio

Mars Home Page
Directory to other Planetary Fact Sheets

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