Mars

Planet Profile

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Mass (kg)...........................................6.42 x 10^23
Diameter (km).......................................6787
Mean density (kg/m^3) ..............................3940
Escape velocity (m/sec).............................5000

Average distance from Sun (AU)......................1.524
Rotation period (length of day in Earth days)........1.026
Revolution period (length of year in Earth days).....686.98

Obliquity (tilt of axis in degrees)..................25
Orbit inclination (degrees)..........................1.85
Orbit eccentricity (deviation from circular).........0.093

Maximum surface temperature (K)......................310
Minimum surface temperature (K)......................150

Visual geometric albedo (reflectivity)...............0.15
Highest point on surface.............................Olympus Mons
                       (about 24 km above surrounding lava plains)
Atmospheric components...............................95% carbon dioxide,
                                                      3% nitrogen,
                                                      1.6% argon
Surface materials....................................basaltic rock and
                                                     altered materials
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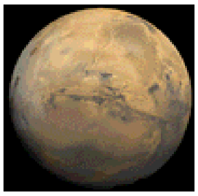
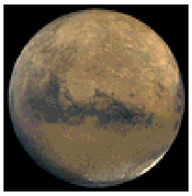
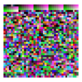


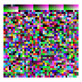
Canyon and Volcanoes

This mosaic of Mars is similar to the view you would see from a spacecraft. The center of the scene shows the entire Valles Marineris canyon system, over 4000 km (2486 mi) long and up to 7 km (5 mi) deep. It extends from Noctis Labyrinthus, the arcuate system of graben on the west side, to the chaotic terrain on the east side. Many ancient river channels begin from the chaotic terrain and north-central canyons and run north. Three Tharsis volcanoes are visible to the west (dark red spots). They rise 10 to 18 km (6 to 11 mi) above the Tharsis Plateau, attaining elevations of 18 to 26 km (11 to 16 mi).

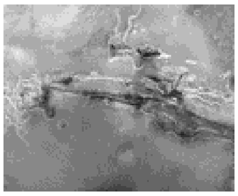
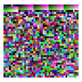
Schiaparelli

This mosaic of Mars is composed of about 100 Viking Orbiter images. The images were acquired in 1980 during mid-northern summer on Mars. Crater Schiaparelli, left of center, is 461 km (277 mi) in diameter. The dark streaks with bright margins emanating from craters in the Oxia Palus region, in the upper left, are caused by erosion and deposition by the wind. Bright white areas to the south, including the Hellas impact basin at extreme lower right, are covered by carbon dioxide frost.

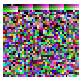
Cerberus

The large dark area left of center is named Cerberus. The arcuate markings in the upper right are in the Amazonis plains and may be sand drifts. The Elysium volcano, a yellow area north of Cerberus, has several channels radiating from its flanks. The three bright spots, upper left, are volcanoes partially veiled by thin clouds.

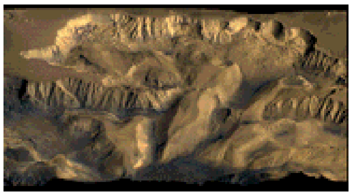
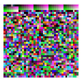
Valles Marineris

Nearly half of the Valles Marineris canyon system is visible here. The entire system extends over 4000 km (2490 mi), covering about one fifth the circumference of Mars. Some parts of the canyon run as deep as 7 km (4 mi) and as wide as 200 km (125 mi). Compared to Valles Marineris, the Grand Canyon on Earth seems quite small at 446 km (277 mi) long, 30 km (18 mi) wide and 1.6 km (1 mi) deep.

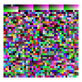
West Candor Chasma

This oblique view of Candor Chasma in Valles Marineris on Mars was mosaicked from high resolution black and white images acquired by Viking 1, and color images by Viking 2. The geomorphology is shaped by tectonics, landslides, wind, and perhaps by water and volcanism.

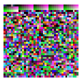
South Candor Chasma

This view of Candor Chasma in Valles Marineris on Mars is from the north, looking south. The image is a mosaic made from images acquired by both of the Viking Orbiters.

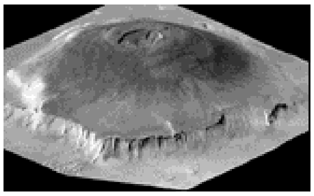
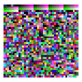
Ophir Chasma

This computer-generated perspective combines images and a surface topography model. The region shown is Ophir Chasma, part of the enormous Valles Marineris canyon system in the central equatorial region. This image shows slumping along the wall of the canyon. The region covered is about 200 km (124 mi) on a side. The depth of the canyon is about 6 km (4 mi).

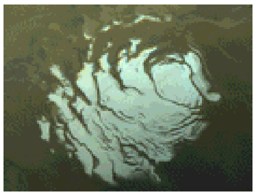
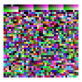
Shield Volcano

Olympus Mons is the largest volcano on Mars. This shield volcano, similar to volcanoes in Hawaii, measures 624 km (374 mi) in diameter by 25 km (16 mi) high. It is 100 times larger than Mauna Loa on Earth. Located on the Tharsis Plateau near the equator, Olympus Mons is bordered by an escarpment. The caldera in the center is 80 km (50 mi) wide and contains multiple circular, overlapping collapse craters created by different volcanic events. The radial features on the slopes of the volcano were formed by overflowing lava and debris.

Enormous Volcano

This 3-dimensional image was created from several images of Olympus Mons. Each image was taken from a different spacecraft position and combined with a computer model of the surface topography to generate a perspective view. The final mosaic shows Olympus as it would be seen from the northeast. It's possible that volcanoes of such magnitude were able to form on Mars because the hot volcanic regions in the mantle remained fixed relative to the surface for hundreds of millions of years.

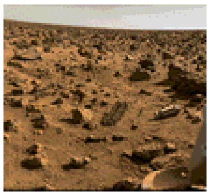
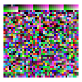
 

South Pole

This mosaic of Viking Orbiter frames shows the South Polar Cap of Mars. The polar cap is composed of water and carbon dioxide ice. The ice appears reddish due to dust that has been incorporated into the cap.

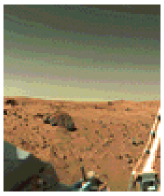
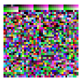
View From Lander 2

This Viking Lander 2 site has more and larger blocks of stone than are seen at the Viking Lander 1 site. The stones are probably ejecta from impact craters near the Lander 2 site. Many of the rocks are angular and are thought to be only slightly altered by the wind and other forms of erosion. Drifts of sand and dust are smaller and less noticeable at the Lander 2 site. The overall red coloring of the Martian terrain is due to the presence of oxidized iron in the regolith. The pink color of the sky is caused by extremely fine red dust that is suspended in Mars' thin atmosphere.

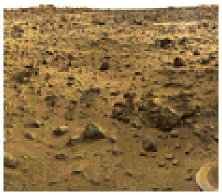
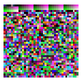
Lander 2 Site

Visible in the lower right corner of the image is the lander's footpad. The shroud that protected the soil collector head during the lander's descent lies a short distance from the footpad. The rounded rock in the center foreground is about 20 cm (8 in) wide. The angular rock to the left and further back is about 1.5 m (5 ft) across. Notice the two trenches dug in the regolith by the sampler arm. The gently sloping troughs between the artificial trenches and the angular rock, which cut from the middle left to the lower right corner, are natural surface features.

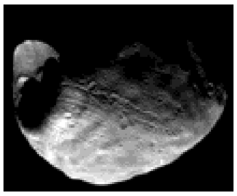
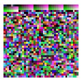
Lander 1 Site

Big Joe, the large rock just left of center is about 2 m (7 ft) wide. The top of the rock is covered with red soil. Those portions of the rock not covered are similar in color to basaltic rocks on Earth. This rock may be a fragment of a lava flow that was later ejected by an impact crater. The red color of the rocks and soil is due to an abundance of oxidized iron in the eroded material. In some areas of this scene rocky plains tend to dominate, while a short distance away drifts of regolith have formed.

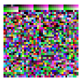
View From Lander 1

This image was taken at the Viking Lander 1 site, using camera 2. The lander's footpad is visible in the lower right. This scene shows a rocky field with trenches in the foreground (just below center) dug by the sampler arm. Patches of drift material and possibly bedrock are visible further from the Lander.

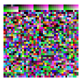
Grooves and Lines

One of the most striking features on the 27 km (16 mi) diameter, irregularly shaped Phobos is the presence of grooves over most of its surface. The grooves seem to radiate in all directions from the giant Stickney crater and converge on the opposite side of the satellite at a region close to the Stickney antipode. The grooves are best developed near Stickney, where some measure 700 m (2307 ft) across and 90 m (294 ft) deep. However, most of the grooves have widths and depths in the 100 - 200 m (330 - 650 ft) and 10 - 20 m (33 - 65 ft) ranges, respectively.

Mosaic of Deimos

This computer mosaic of Deimos was made with images acquired from Viking Orbiter during one of its close approaches to the moon. The 15-km (9-mi) diameter Deimos circles Mars every 30 hours. Scientists speculate that Deimos and its companion moon Phobos were once passing asteroids that were pulled in by the gravity of Mars.

Martian Meteorite

Even though this meteorite was collected in Elephant Moraine, Antarctica in 1979, some scientists believe that it came from the planet Mars. The minerals found in this rock are similar to those that scientists expect to find in rocks on Mars. This meteorite also contains vesicles, or shiny pockets, which contain air very much like the air measured on Mars by the Viking spacecraft. This meteorite is 180 million years old.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