

Is It Alive?

What is known about Mars?

Think Outside the Book

13 Debate Research the surface features of the northern and southern hemispheres of Mars. Decide which hemisphere you would rather explore. With your class, debate the merits of exploring one hemisphere versus the other.

A fleet of spacecraft is now in orbit around Mars (MARZ) studying the planet. Space rovers have also investigated the surface of Mars. These remote explorers have discovered a planet with an atmosphere that is 100 times thinner than Earth's and temperatures that are little different from the inside of a freezer. They have seen landforms on Mars that are larger than any found on Earth. And these unmanned voyagers have photographed surface features on Mars that are characteristic of erosion and deposition by water.

Mars Is a Rocky, Red Planet

The surface of Mars is better known than that of any other planet in the solar system except Earth. It is composed largely of dark volcanic rock. Rocks and boulders litter the surface of Mars. Some boulders can be as large as a house. A powdery dust covers Martian rocks and boulders. This dust is the product of the chemical breakdown of rocks rich in iron minerals. This is what gives the Martian soil its orange-red color.

Statistics Table for Mars

Distance from the sun	1.52 AU
Period of rotation	24 h 37 min
Period of revolution	1.88 y
Tilt of axis	25.3°
Diameter	6,792 km
Density	3.93 g/cm ³
Temperature	-140°C to 20°C
Surface gravity	37% of Earth's gravity
Number of satellites	2

Mars's northern polar ice cap is composed of carbon dioxide ice and water ice. Its size varies with the seasons.

Mars Has Interesting Surface Features

The surface of Mars varies from hemisphere to hemisphere. The northern hemisphere appears to have been covered by lava flows. The southern hemisphere is heavily cratered.

Large volcanoes are found on Mars. At 27 km high and 600 km across, Olympus Mons (uh-LIM-puhs MAHNZ) is the largest volcano and mountain in the solar system. Mars also has very deep valleys and canyons. The canyon system Valles Marineris (VAL-less mar-uh-NAIR-iss) runs from west to east along the Martian equator. It is about 4,000 km long, 500 km wide, and up to 10 km deep. It is the largest canyon in the solar system.

Mars Has a Thin Atmosphere

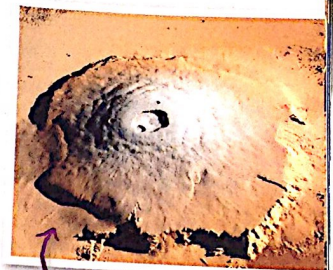
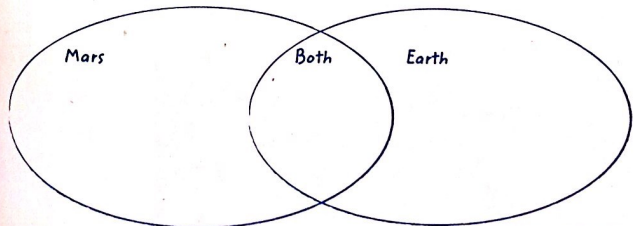
Mars has a very thin atmosphere that is thought to have been thicker in the past. Mars may have gradually lost its atmosphere to the solar wind. Or a body or bodies that collided with Mars may have caused much of the atmosphere to have been blown away.

Unlike Earth, Mars's atmosphere is composed mostly of carbon dioxide. During the Martian winter, temperatures at the planet's poles grow cold enough for carbon dioxide to freeze into a thin coating. During the summer, when temperatures grow warmer, this coating vanishes.

Winds on Mars can blow with enough force to pick up dust particles from the planet's surface. When this happens, giant dust storms can form. At times, these storms cover the entire planet.

Active Reading 14 Explain What are two possible reasons why the atmosphere on Mars is so thin?

15 Compare Compare and contrast the physical properties of Mars to the physical properties of Earth.



Olympus Mons is the largest volcano in the solar system.



Hebes Chasma is a 6,000 m-deep depression that is located in the Valles Marineris region.