5. Mars (4th Planet)
4

Distance: 227.9 million km
Diameter: 6,779 km
Moons: 2 (Phobos, Deimos)

Key features:

Red planet

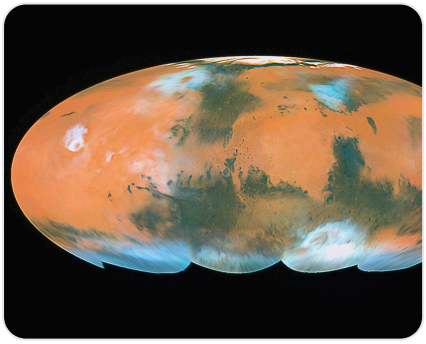
Iron oxide surface

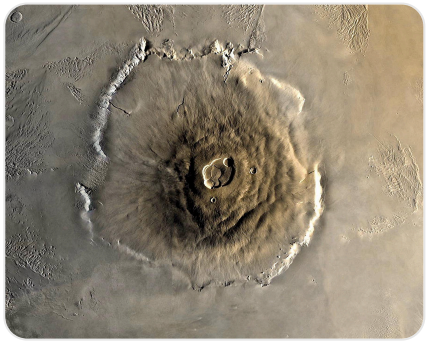
Largest volcano: Olympus Mons

Conditions:

Cold desert

Thin CO_2 atmosphere full info





Mars – The Red Planet (4th from the Sun)

Mars is the fourth planet from the Sun and one of the most studied planets because of its similarity to Earth and its potential to support life in the past.

Basic Facts

- **Average distance from Sun:** 227.9 million km
- **Diameter:** 6,779 km (about half of Earth's diameter)

- **Mass:** 6.39×10^{23} kg
- **Gravity:** 3.71 m/s^2 (about 38% of Earth's gravity)
- **Length of day:** 24 hours 37 minutes (similar to Earth)
- **Length of year:** 687 Earth days
- **Moons:** 2 — Phobos and Deimos

Why Mars is Called the Red Planet

Mars appears red because its surface contains **iron oxide (rust)**. This rusty dust covers rocks and soil, giving Mars its reddish color when viewed from space or Earth.

Surface Features

Mars has many fascinating geological structures:

1. Olympus Mons – Largest Volcano in the Solar System

- Height: about **22 km** (almost 3 times Mount Everest)
- Diameter: about **600 km**
- It is a **shield volcano**, formed by flowing lava.

2. Valles Marineris – Giant Canyon System

- Length: about **4,000 km**
- Depth: up to **7 km**
- Much larger than Earth's Grand Canyon.

3. Polar Ice Caps

- Made of **water ice and frozen carbon dioxide**
- Grow in winter and shrink in summer.

4. Dust Storms

- Mars has **huge dust storms**
- Some storms cover the **entire planet**

Atmosphere and Weather

- Very **thin atmosphere**
- Made mostly of:

  - 95% Carbon dioxide (CO_2)
  - Nitrogen
  - Argon
- Very little oxygen

Temperature

- Average: **−63°C**
- Maximum: **20°C (daytime near equator)**
- Minimum: **−140°C (polar regions)**

Mars is a **cold desert planet**.

Water on Mars

Evidence shows Mars had water in the past:

- Dry riverbeds
- Valley networks
- Mineral deposits formed in water
- Frozen water at poles and underground

Liquid water cannot exist long today because of low pressure.

Moons of Mars

1. Phobos

- Larger moon
- Orbits very close to Mars
- May break apart in the future

2. Deimos

- Smaller moon
- Farther from Mars
- Smoother surface

Both are irregular in shape and likely captured asteroids.

Gravity on Mars

If you weigh **60 kg on Earth**, you would weigh about:

23 kg on Mars

You could jump higher and move more easily.

Exploration of Mars

Mars is explored by many spacecraft and rovers:

- NASA rovers:
  - Curiosity
  - Perseverance
  - Opportunity (mission ended)
  - Spirit (mission ended)

These rovers study rocks, soil, and signs of past life.

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Scientists believe Mars may have supported **microbial life in the past** because it had:

- Water
- Thicker atmosphere
- Warmer temperatures

Today, life would be difficult due to harsh conditions.

Key Summary

- 4th planet from the Sun
- Called the Red Planet due to iron oxide
- Cold desert with thin CO_2 atmosphere
- Has the largest volcano: Olympus Mons
- Has 2 moons: Phobos and Deimos
- Evidence of water in the past
- Major target for future human exploration

If you want, I can also provide:

- Comparison of Mars and Earth
- Diagram of Mars structure
- Simple school-level notes or exam-ready points