



Could humans live on Mars?

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Ages 11-16 ⌚ 4 min read

Mars is the best candidate for human habitation beyond Earth — but "best candidate" comes with enormous asterisks. The Martian environment is genuinely hostile to human life in almost every way.

The challenges

Atmosphere: Mars has an atmosphere about 100 times thinner than Earth's, and it's mostly carbon dioxide. You can't breathe it. The thin atmosphere also means almost no protection from solar radiation and cosmic rays — which, over years, would cause serious health damage. On Earth, our thick atmosphere and magnetic field protect us.

Temperature: Mars averages about -60°C , with extremes from -125°C at the poles in winter to a relatively balmy 20°C near the equator on a summer day — but those warm days are rare and brief. The temperature drops dramatically at night.

Gravity: Mars has about 38% of Earth's gravity. We don't know what living in low gravity for years does to the human body long-term. ISS astronauts in zero gravity suffer significant bone and muscle loss — partial gravity would be better, but how much better we don't know.

Living on Mars would be like permanently living in a submarine on the surface of the Moon, in Antarctica, during a solar storm. The habitat keeps you alive, but the moment you step outside without a full life-support suit, you die within minutes. Every breath of air, every drop of water, every meal would need to be either brought from Earth or generated on-site. There's no going outside for a casual stroll.

What would be possible?

Mars does have some useful resources. There's water — frozen in the soil (permafrost) and in the polar ice caps. Carbon dioxide can be converted to oxygen. Solar power works, though less efficiently than on Earth. In-situ resource utilisation — manufacturing what you need from local materials — is the key concept behind making a Mars colony viable. NASA's Perseverance rover has already demonstrated producing oxygen from Martian CO_2 .

When could it happen?

SpaceX is targeting crewed Mars missions in the late 2020s to 2030s. NASA has longer-term plans. The engineering challenges are immense — the journey takes 7–9 months, communications lag up to 24 minutes each way, and there are currently no return missions planned for early trips. The first Mars inhabitants would be on their own, at enormous distance, with no emergency rescue possible. It will be the most ambitious, dangerous, and expensive human journey ever attempted.