

From Earth to Mars

Could people ever set up a base on Mars? Here we look at some of the challenges.



Mars and Earth compared

Mars is cold and there's almost no oxygen in its thin atmosphere.

| | Earth | Mars |
|---------------------------------|----------------|----------------|
| distance from Sun | 150 million km | 228 million km |
| diameter | 6400 km | 3400 km |
| day length | 24 h 0 min | 24 h 40 min |
| surface gravity | 9.8 N/kg | 3.7 N/kg |
| atmospheric pressure at surface | 101 kPa | 0.6 kPa |
| average surface temperature | +14°C | -53°C |



Mars500

On 4 November 2011, six 'astronauts' emerged after spending 500 days in a simulation of a flight to Mars. During this time, they explored a mock-up of the martian surface.



A space station might be delivered to Mars' surface in advance of the astronauts.

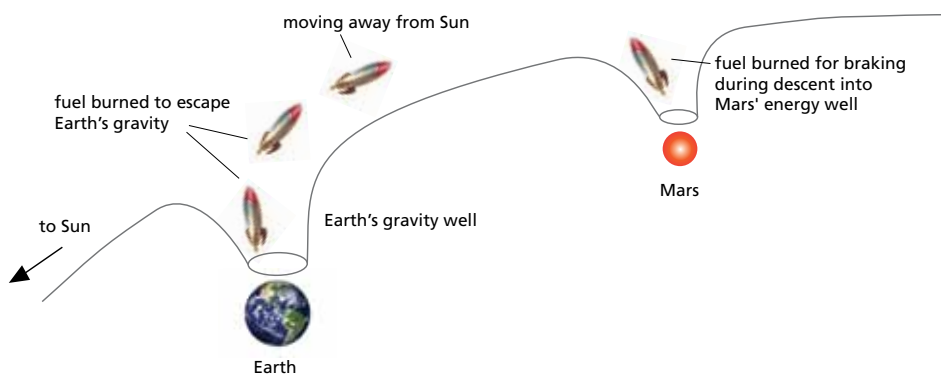
Wildlife

Robotic exploration of Mars' surface has yet to find evidence of hostile life-forms.



Keeping in touch

When Mars' orbit takes it to the opposite side of the Sun from Earth, signals between the two planets will take 12 min 13 s to cross almost 380 million km of space.



Fuel for flight

Living on Earth is like being at the bottom of a gravity 'well'. Mars' well is shallower. A spacecraft from Earth to Mars would need sufficient fuel to move upwards through the gravitational fields of both Earth and Sun. It would also need fuel for braking, and for the return journey. To save fuel, a large craft might orbit Mars, sending down a smaller lander.