

DIY return ticket from Red planet

NASA scientists are planning to send a survey craft to Mars with only part of the fuel needed to return to Earth. To save weight and cost, the mission will incorporate a production plant to convert Martian carbon dioxide into liquid oxygen. This will eliminate the need to carry all the fuel required for the 205-day return trip, cutting the craft's weight by a third

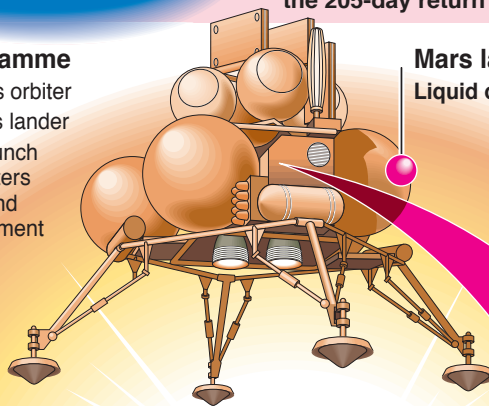
Mars Surveyor programme

Nov 1996: Launch of Mars orbiter

Dec 1996: Launch of Mars lander

1998, 2001 and 2003: Launch of three more pairs of orbiters and landers when Earth and Mars are in optimum alignment

2005: Launch of Mars sample return mission



Mars lander

Liquid oxygen and propane fuel tanks

Fuel production plant

Absorbs carbon dioxide during night-time temperatures of -100°C . Daytime sunlight powers chemical reactor, breaking down carbon dioxide into oxygen and carbon monoxide. Oxygen is liquified and stored in fuel tanks

Micro-rover

Shoebox-sized rover, controlled from Earth, records images and collects up to 2.5kg of pebbles, rock chips, soil and dust

Roving vehicle
70cm long

During the 534-day stay on Mars, the production plant generates 970kg of liquid oxygen, the amount required to power the return trip to Earth

