

Mars Curiosity rover success depends on risky landing

NASA's Mars Science Laboratory, dubbed Curiosity, will look for signs of microbial life in the 150km-wide Gale Crater. Previous missions found ice and signs that water once flowed on the red planet

SPACECRAFT

Aeroshell consists of backshell and heat shield. Backshell houses parachute, rover and sky crane

Cruise stage provides power and propulsion for nine-month voyage

Heat shield largest ever used in space – diameter 4.5m

6 Speed slows to 2.7km/h. 20m above surface, rover descends on harness below sky crane. Rover wheels deploy

8 Sky crane flies off to crash land 150m away

7 Rover touches down 6.5 minutes after atmospheric entry. Harness released. Rover arm and mast deploy

DESCENT SEQUENCE

1 Cruise stage separates from aeroshell, craft turns heat shield towards planet

2 Aeroshell enters atmosphere at altitude of 125km and speed of 21,000km/h

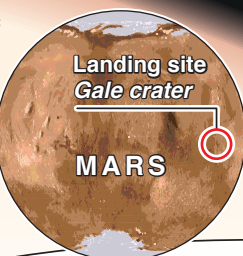
3 Four minutes after entry, craft slows to 1,700km/h. Supersonic parachute opens at altitude of 10km

4 Heat shield jettisoned 7km above planet. Speed 576km/h

5 50 seconds from landing, sky crane and rover drop away from backshell. Eight thrusters ignite to control descent

CURIOSITY ROVER

Will study planet for at least one Martian year (equal to 23 Earth months)



Nuclear power source
4.8kg of plutonium dioxide. Generates electricity from heat of radioactive decay. Minimum lifetime 14 years

Rover dimensions
Length 3m
Height 2.2m

Navigation cameras

Wheels: 50cm diameter, each with its own drive motor

Top speed
4cm per second

ChemCam
Fires laser beam at small patch of rock. Vapourised material analysed to identify composition

Robot arm
Extends 2.3m

Turret: Contains magnifying camera, element-identifying spectrometer and tools for gathering rock samples