

Europe heads for Mars

Mars Express Orbiter:

Carrying seven scientific experiments to provide remote sensing of atmosphere, mineral composition of surface, and measure thickness of water-ice below surface

Polar orbit:

Mars Express will observe whole planet for one Martian year (687 Earth days)

Lander: Jettisoned from orbiter,

Beagle 2 will coast for five days, spinning at 12 revolutions per minute to ensure stability

Beagle 2: After touch-down the

lander opens like a clamshell to deploy solar panels and instruments

UHF antenna: Sends signals to orbiter

Landing site:

Isidis Planitia, a sedimentary basin where traces of life could be preserved

Beagle 2

Landing:

Pilot chute and main chute slow descent

Three gas-filled air bags provide soft landing. After release, bags change shape and roll away from lander

Robot arm:

- Carries Beagle's "paw" – a platform equipped with:
1. Pair of stereo colour cameras
 2. X-ray spectrometer
 3. Optical microscope
 4. Mossbauer spectrometer
 5. Grinder to drill for rock samples
 6. Lightweight rover – the "Mole"

Sample collection:

30-cm-long "Mole" deployed from "launch tube" on lander's robotic arm

Mole "crawls" using momentum of spring-loaded mechanism

Mole – on end of retrieval cable – can burrow 1mm per stroke, up to 1.5 metres below surface, to collect a tiny soil or sediment sample in its "mouth"

Mini-lab:

Sample baked in oxygen. Any carbon present generates carbon dioxide gas which is analyzed by mass spectrometer. **Ratio of different isotopes of carbon** could indicate possible life