

## Mars Rover Mission Choices:

Design and build a model rover that will accomplish one or more of the following missions:



1. **Explore the craters on Mars.** Your vehicle will try to find a crater suitable for use as a domed settlement site. It should make measurements, test the soil and take photographs.
2. **Explore the polar ice caps of Mars.** Mars has carbon dioxide ice and water ice. Your vehicle should determine how much of each type of ice there is and map the distribution and depth. Samples of the ice should be analyzed for impurities, and its potential to be purified for future manned missions.
3. **Explore the valleys of Mars.** Rift valleys will provide information about the geologic history of the planet, while river valleys might provide clues as to the sources of past water or evidence of ancient forms of life. Devise a method to collect samples and analyze them.
4. **Analyze the weather at several sites that have been identified as possible areas for future settlement.** Instruments will need to make careful measurements of temperature, wind, and the composition of the atmosphere (gases and water vapor).
5. **Identify the elements and compounds found in the rocks and soil of Mars.** Determine how much oxygen is present, and whether the soil could be used for planting or if metal ores are present for future mining.
6. **Search for forms of water on Mars possibly found a layer of frozen soil, called permafrost.** Your vehicle will be exploring the areas near the poles, drilling tens to hundreds of meters below the surface, providing data for future Mars colonies.
7. Explore for fossils of ancient life forms in the riverbeds and the canyons of Mars. Samples that are collected will need to be mapped, analyzed and photographed.
8. **Search for present life on Mars in the Polar Regions.** Microbes have been found in the permafrost and glaciers on Earth, some remain dormant until they are warmed up. Design a system to gently warm and analyze polar and permafrost samples, looking for similar occurrences on Mars.

9. **Develop your own concept** based on recent scientific developments.