

MISSION TO MARS

KEY CONCEPTS

Review with your students before your visit. Students should be familiar with basic lab techniques such as using a microscope and following written lab procedures.

Of all the planets in our Solar System, Mars is the most like Earth. The rocky planet has a thin atmosphere, weather, seasons and a day that is 24 hours and 37 minutes long. Like Earth, Mars has two polar ice caps. Mars has a complicated surface that is similar to Earth, so scientists have long been interested in studying Mars. As our neighbor in the solar system, it is an accessible planet even with current technology.

Scientists are deeply interested in Mars and have developed scientific objectives for the study of this planet. What is a scientific objective? In science, an objective is the main purpose or goal of an experiment or activity. Scientists like to ask questions, and they develop experiments to find the answers to their questions.

In Mission to Mars, we have three objectives for our missions. Let's look at each of these objectives individually.

1. Is it possible for people to live on Mars?

Why is this important?

For humans to create a long term settlement on Mars, water is crucial. People, plants, and other living things from Earth need water to survive. Prior to sending humans to Mars we want to be certain that survival is possible.

What is the evidence?

Water has been shown to exist on Mars. This water can be used to meet human needs and can also be broken down to use the hydrogen to make rocket fuel. Experiments are underway with a Mars soil stimulant to see if it is possible to grow food using Mars soils.

What questions do we want to answer?

How can we protect humans from solar radiation on Mars? Can we grow food on Mars? How long can the human body exist in the lower gravity conditions on Mars without serious loss of bone/muscle mass?

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2. Could there be life on Mars?

Why is this important?

Since Mars previously had water flowing on the surface in its history, life may have existed in these lakes or ponds, or it may continue to exist in water under the surface. If life exists on Mars, scientists will want to study it before exposing that life to humans. Fossil evidence of life may also be found for study.

What is the evidence?

Evidence has been discovered showing that liquid water likely exists under the surface of Mars. Discoveries of microbial life in extreme conditions here on Earth make it likely that life could exist under similar conditions on other planets. New findings about salt water flows on Mars increase the excitement of the possibility of microbial life on Mars.

What questions do we want to answer?

If there is life on Mars, what is it like? How long has it existed? Is this life harmful to humans?

3. What happened to Mars?

Why is this important?

We want to know what happened to Mars because Mars and Earth started out very much alike. Could what happened to Mars happen to Earth someday?

What is the evidence?

The landscape on Mars shows signs of past rivers and small oceans that are no longer there. Recent evidence indicates that Mars once was warmer, wetter, and had a denser atmosphere. It is believed that Mars does not have plate tectonics, such as earthquakes, so the planet surface may have evidence of the planet's entire history.

What questions do we want to answer?

Scientists want to know what happened to the atmosphere of Mars. Why is it so thin? They also want to know what happened that caused Mars to lose much of its water. Has the planet had some kind of climate change?