



CLASSROOM ACTIVITY

A Future on Mars

OBJECTIVE

After exploring key facts about Mars, students will consider how an outdoor activity could be adapted to take place on this Red Planet.

MATERIALS

- All About Mars [packet](#) or devices to access this Mars [webpage*](#), enough for half the class
- Imagining the Future handout (two pages), enough for half the class

*Note: It may be easier to manage the class if you provide a printout rather than having the students access the webpage on devices. Check with the classroom teacher in advance to see what s/he recommends.

ENGAGE

- Begin with a game of Fact or Fiction: Mars Edition. Ask the class for suggestions on a movement or action to indicate *fact* and another to indicate *fiction*. The actions could be as simple as standing up and sitting down.
- Then run through the following Fact or Fiction statements, each time asking students to indicate whether they believe the statement is fact or fiction:
 - While the Earth is 93 million miles from the Sun, Mars is 142 million miles from the Sun! (Fact)
 - The average temperature on Mars is -10 degrees Fahrenheit. (Fiction: The average temperature on Mars is -81 degrees Fahrenheit!)
 - A year on Mars is almost twice as long as a year on Earth. (Fact)
 - Gravity on Mars is about one-third as strong as the gravity on Earth. (Fact)
 - Mars has 19 moons. (Fiction: Mars has two moons!)
 - While the Earth's atmosphere is made mostly of nitrogen and oxygen, Mars' atmosphere is made mostly of carbon dioxide. (Fact)

EXPLORE

- Tell the class that the United States and NASA have a goal to establish a permanent human presence on the Moon by 2028. Scientists see this permanent lunar residence as a gateway to deep space, and they hope to apply what they learn as they look toward exploring Mars.
- Tell students that while scientists still have a lot to learn before human life on Mars is possible, it can still be fun to apply what we currently know about this planet as we think about future possibilities.
- Divide the class into pairs and distribute an All About Mars packet to each pair or instruct pairs to grab a device and access mars.nasa.gov/all-about-mars/facts.
- Also distribute one Imagining the Future handout to each pair. Review the handout's directions as well as the first three steps. (Step 4 will be completed later). Then instruct students to complete Steps 1–3.
- As pairs are wrapping up Step 3, encourage a few students to share the activity they selected, how it may be affected by Mars' conditions, and some of their creative modifications.

APPLY

- Then instruct students to move on to the final step and consider just a few of the different STEM careers that influence space exploration.
- When there are about five minutes left in the class session, wrap up by reading Step 4's career descriptions and asking students to explain how each one could impact their martian activity.
- Conclude by encouraging students to keep aerospace careers in mind as they look toward their own futures!

Sources

mars.nasa.gov/all-about-mars/facts

nasa.gov/specials/moon2mars

bls.gov/ooh/architecture-and-engineering/aerospace-engineers.htm

IMAGINING THE FUTURE

Directions: If life on Mars became possible, it would certainly look different than life on Earth. Follow the steps below to consider how one part of life—outdoor activities—may have to change if humans could live on the Red Planet.

Step 1: Select a sport or outdoor activity. Below, briefly outline the activity's rules or participation instructions.

Step 2: Browse the facts about Mars and record at least three different Martian facts or conditions in the left column that could impact this activity. Then use the right column to explain the impact in further detail.

Martian Facts and/or Conditions	How could this impact your activity?

IMAGINING THE FUTURE

Step 3: What could you change about this activity to make it easier for people to enjoy on Mars? (Think about clothing, equipment, when or where the activity is performed, and its rules.) Be creative and assume that technology can be developed to make anything possible!

Step 4: Read through the following space careers. Then, select one that could be helpful in making your Martian activity a reality and explain *how* it could help in the box below.

- **Aerospace engineers** design, construct, and test aircraft, spacecraft, and satellites. They assess project proposals and new ideas to determine if they are possible. As projects begin to move forward, they consider environmental conditions and constraints in order to create effective designs.
- **Mechanical engineers** design, develop, manufacture, and install all products used in space. These products range from robotics, machines, and spacesuits to smaller sensors and tools. Mechanical engineers also study and assess the effects of space on these products and make changes as needed.
- **Atmospheric scientists** use their background in weather and climate to analyze weather conditions in space. They use data to develop space weather forecasts as well as study phenomena like temperature, dust storms, and cloud patterns.
- **Aerospace physicians** are medical doctors who support the health and safety of people in space. A large portion of their work is preventative, which means they make sure people are physically ready to travel to space and have the proper equipment to keep them safe before they leave. They also focus on occupational medicine, which helps prevent and treat conditions related to being in space while people are traveling.
- **Environmental health and safety engineers** protect the health and safety of humans by assessing the conditions and hazards where people work and live. They also monitor and track the impact that humans have on their environment to ensure that the environment and humans co-exist as well as possible.