Teacher Guide

Cool Career

Planetary Scientist
Pascal Lee
Mars Institute/SETI Institute

Ready, Set, Go!
Pascal Lee has high hopes of sending you to Mars. That's right. Pascal and his team are preparing a future mission—the first human mission to Mars. It will be the biggest achievement ever in space exploration history. One thing on Pascal's to-do list is learning how to drive rovers on the Red Planet. They're not real rovers, but souped-up Humvees. And they're not on the real Mars, but on an Arctic island that looks like Mars. "It's like a gigantic Hollywood set—a *real* Mars park," Pascal says.

Mars Mimic
The island is a rocky and cold desert, with no roads or trees. Perfect—just like Mars! Pascal experiments with different techniques and technologies for exploring the real Mars. How to navigate the tough terrain, and other lessons Pascal learns, will help future astronauts be better Mars explorers.

Life on Mars?
Astronauts will drive rovers long distances across the Red Planet to gather clues. What mystery will they try to solve? Whether Mars ever was—or still is—wet enough to support primitive life. Investigating that question and preparing for human exploration of Mars are just two of Pascal's passions. He has also explored Mars-like terrain at the other end of Earth—Antarctica—where Pascal searched for meteorites. How cool!

A planetary scientist studies the planets, their moons and rings, and other objects in our solar system. Pascal studies the history of water on Mars—and whether life could have developed there. Other **planetary scientists**

- study the atmosphere of other planets.
- analyze the makeup of rocky asteroids and icy comets.
- search for pockets of liquid water below the surface of Jupiter's moons.

Pascal tests a space suit in his giant outdoor lab—Devon Island in the Arctic.

After you read about Pascal Lee, do these activities.

Roving Mars

Robotic rovers exploring Mars are operated remotely by scientists back on Earth. The rovers usually have a main body to hold a computer; a camera to snap pictures; instruments to analyze the air, soil, and rocks; and solar panels to generate electricity to run on. Someday, astronauts will explore Mars. Imagine you're an engineer. Get to work and design a rover to carry astronauts. Label its parts and include a caption that describes what it does. Here are some things to think about. The rover must:

- go over rocks, into craters, and through deep sand.
- withstand below-freezing temperatures.
- support heavy weight.
- send data back to Earth.
- store food, water, oxygen, and other supplies.
- use renewable energy.

Draw your design here

Caption: _____

_____

STANDARDS ALIGNMENT

NGSS **MS-ESS.B:** Earth and the Solar System: The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them.

MS-ETS1.A: Defining and Delimiting Engineering Problems: The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions.

CCSS **RTS.6-8.3:** Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

If You Can Dream It . . .

When Pascal was a young boy in Hong Kong, he dreamed of space travel and exploration. He worked to make his dream come true. What are some things you can do today and the rest of the year to make your dream come true? Write down at least three ideas.

1. _____

2. _____

3. _____