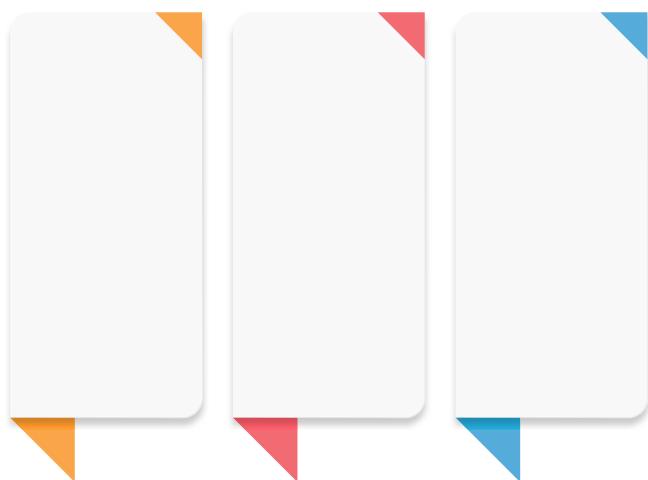### Science

How does science build on past breakthroughs?

01 What are the three most important scientific breakthroughs connected to the study of space and space travel? Compare your list in a group of four.

02 Read "The Wild Rover" and compare the astronaut's list with yours. Write that list here. With your group, discuss the differences.

03 Write summaries of the importance of each scientific advance in the study of space and space travel.

1. High-powered telescopes: _____

   _____

2. Reusable spaceships: _____

   _____

3. Artificial intelligence: _____

   _____

The Wild Rover

Student astronaut mission log
Location: Mars temporary base

There are only six days remaining in my temporary, solo trip to Mars, and while it's been challenging, it's also been exhilarating: red skies, red dust, and instant noodles. Establishing a base capable of supporting human life on Mars has long been considered science fiction, so how did it become a reality? Science, and there have been a **myriad** of advances that have helped us, me, get here. Here are three scientific **breakthroughs** that had a significant impact.

First and foremost, **telescopes** such as Hubble and Webb allowed space scientists to see farther than ever. They could even see the beginning of the universe—the immediate effects of the Big Bang in action, so to speak, inside a black hole. Also important was the ability to discover planets with Earth-like qualities and plan missions. The impact of Hubble, Webb, and other telescopes cannot be overstated—they are our eyes, and we now see far and wide.

Next, the science behind the development of reusable **spaceships** opened up space travel and, therefore, the study of space, first used in the NASA Space Shuttle program in 1981. Much later, SpaceX rockets could land, refuel, and return, making this mission to Mars possible and, in general, making space travel less costly, faster, and more routine.

Finally, artificial intelligence has enhanced the study of science in different ways; in particular, it helps **rovers** and robots work without constantly receiving instructions from Earth because these instructions are far away. For example, the Perseverance Rover used AI to land safely by scanning **terrain** and choosing the best location. In addition, AI is used to map terrain, predict dust storms, and make real-time decisions.

04 Work with a classmate to create the student astronaut's next mission log. What do they see? What technology do they use?

05 **Circle the homograph in each sentence and write its meaning.**

1. The Mars rover began to tire quickly on the rough terrain, so engineers modified its wheel suspension.

_____

2. Instruments needed to be carefully aligned so astronomers could view the exoplanet clearly.

_____

3. The science fair will be held next month.

_____

4. Satellites help get close images of the melting glaciers.

_____

5. When they started the project, they did not know what type of discovery they would make.

_____

07 **Imagine you are living 50 years in the future. What are the most relevant scientific advances in your life? Write a message describing your daily life. Use three homographs in your text.**

06 **Write sentences using the other meaning of the homographs from Exercise 5.**

1.

2.

3.

4.

5.

08 **Work in a group of three. Imagine you are a government agency in charge of the study of space. Discuss the statement. Then, share your opinion with another group.**

Because technology has improved so much, space travel should be abandoned for investigation from Earth due to its cost and risk.