

Activity sheet (Secondary level)

“China’s Lunar and Mars Exploration”
Special Exhibition



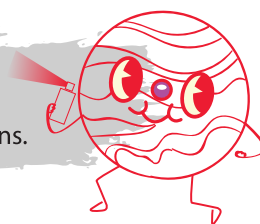
Rovers for Lunar and Mars Exploration

In this project, we will unveil the mysteries of deep space with the help of unmanned rovers. Come and study how these remarkable rovers navigate the terrains, withstand harsh environments, and uncover the secrets of our nearby celestial bodies.

Project Learning

Task 1: Get to know Moon and Mars

Choose either Moon or Mars for research and answer the following questions.



1

How is the atmosphere of Moon / Mars differ from Earth's atmosphere?

2

How does the atmosphere of Moon / Mars affect its environmental conditions?

3

What are the temperature extremes on Moon / Mars? How do these extreme temperatures affect the operation of the rover?

4

Are there any natural resources, such as water or minerals, on Moon / Mars? How can humans make use of them?

5

How does the day-night cycle on Moon / Mars differ from that on Earth? How does this affect the rover with respect to electricity generation and communication using solar energy?

6

What are the geological features of Moon / Mars? What do they tell us about the history of Moon / Mars?

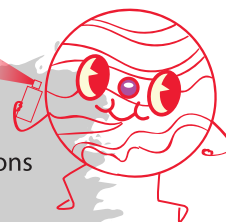
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Task 2: Study the rovers

Rovers can move on rough surfaces, withstand tough environmental conditions, and collect valuable scientific data for researchers.

Based on your selection of the research subject in task 1, study the missions, functions and features of the lunar rover Yutu or Mars rover Zhurong, and answer the following questions:



1

What scientific instruments (payloads) are installed in the rover?

2

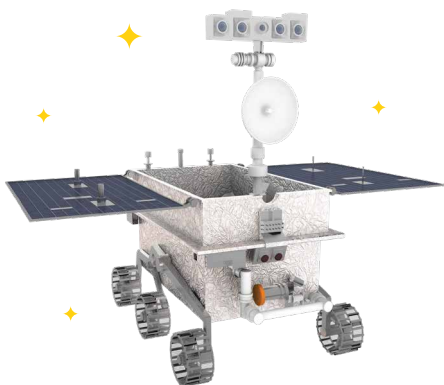
What are the special designs of the rover’s mobility system that allow the rover to move on rough surfaces?

3

How does the rover obtain energy? Why is it possible for the rover to withstand extreme temperatures?

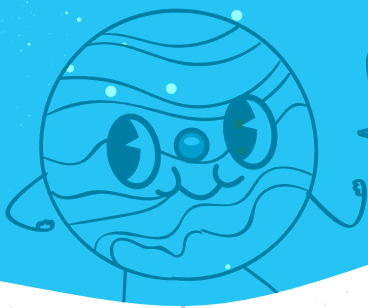
4

What are the purposes of the exploration mission? Any achievements made?



Let’s explore the achievements China made in its lunar and Mars exploration!





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Task 3: Become an adventurous friend

Try to design and make a prototype rover.

1

Choose one of the challenges that a rover may face during its exploration on Moon / Mars.

2

Study how scientists and engineers address the challenge in designing the rover.

3

See whether there are ways, such as providing additional features or modifying current instruments, to enhance the rover's functionality.

4

Design or modify the current rover so that it can cope with the challenge more effectively.

5

Make a prototype rover using materials such as cardboard, wheels and solar panels. Alternatively, you can use design and engineering apps, such as Tinkercad, to create a virtual prototype.

6

Present to the class your design and explain the strategies used to cope with the challenge.

Draw the rover design in the space below.

