

Year 8 Science Unit Task Booklet

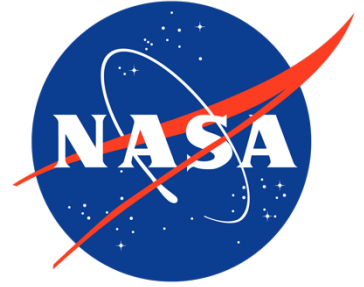
Moon to Mars!



EXPLORE MOON *to* MARS



Let's Explore – You choose!



LI: I can explain some of the key challenges of having a long-term human presence on the moon and mars.

Greenhouse on the Moon & Mars

1. Research the Engineering Design Process (EDP) and briefly explain how space engineers would need to apply each step to the concept of building greenhouses on the moon and Mars.
2. Explain what the practice called In-Situ Resource Utilization (ISRU) is and why it is important for making these greenhouses possible.
3. The moon is a microgravity environment. Find out:
 - a. how gravity affects plant growth on earth – find at least one experiment/research program that has improved our understanding of how gravity (or lack of it!) affects plant growth
 - b. what might happen if you have no gravity (problems? benefits?)
 - c. scientist are designing the Lunar Greenhouse to work on the Moon (draw sketch of it and annotate the diagram to explain its key features).
4. Collaboration - give one example of how different scientists (from different areas of science) have collaborated to come up with solutions.

Human Research Program (HRP)

<https://www.nasa.gov/hrp/elements>

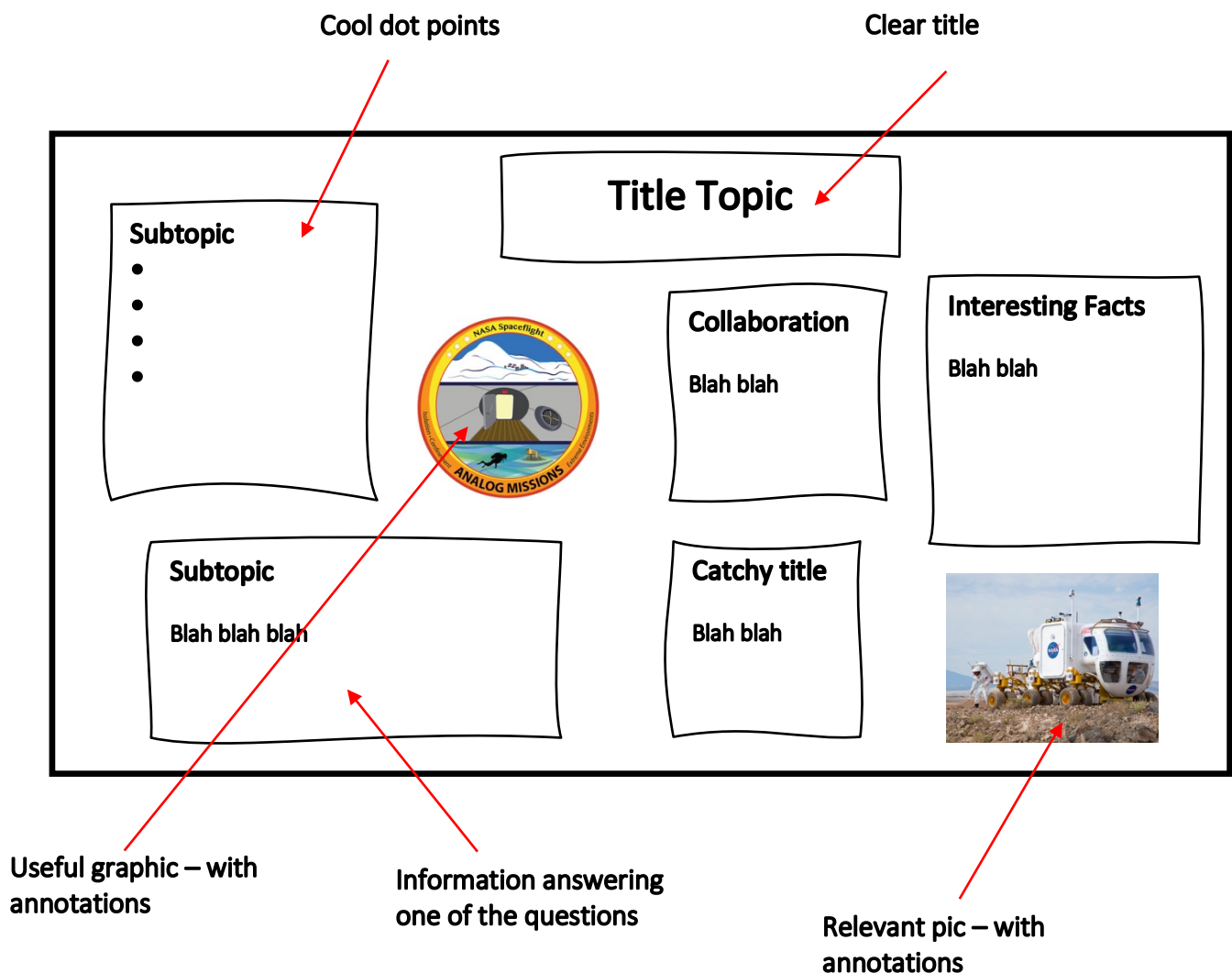
- 1. Research and read about the key HPR elements using the link above.**
 - a. Give a brief sentence or two describing each element.
 - b. Choose one element that interests you the most and...
 - i. Summarize some of the key risks for this element
 - ii. Explain one research test/experiment that has been taking place in order to learn more about this element – be clear on how results have helped our understanding!
 - iii. Read one of the ‘featured stories’ and write as many key points from that story on a recipe card (front and back).
 - iv. Collaboration - give one example of how different scientists (from different areas of science) have collaborated to come up with solutions.
- 2. List and briefly describe the 5 key hazards of spaceflight.**
 - a. Choose one that you think is the most interesting...
 - i. explain what NASA and other agencies/scientists are doing to study this hazard, how it affects humans,
 - ii. explain how they are trying to counter the problem (deal with it)

Final Product – FINDINGS WINDOW!

How to document and present your findings:

1. Conduct your research and save your rough notes.
2. Design a research Findings Window that lets others have a look into what you have found about your chosen focus area.
3. Checklist:
 - a) No smaller than A3
 - b) neat and clear
 - c) contains information for each question
 - d) Makes me want to read it 😊 Looks attractive and interesting

FINDINGS WINDOW! (this is what I've seen)



Marksheet

Name: _____

Let's Explore – You Choose!

Date: _____

5 = Well Above

4 = Above standard

3 = At standard

2 = Below standard

1 = Well below standard

Achievement Standard		Achievement					Comments
		1	2	3	4	5	
HE1	examine the different science knowledge used in occupations						
HE2	explain how evidence has led to an improved understanding of a scientific idea						
HE3	describe situations in which scientists collaborated to generate solutions to contemporary problems						
IS1	identify and construct questions and problems that they can investigate scientifically						
IS7	apply scientific knowledge and investigation findings to evaluate claims made by others						
IS8	use appropriate language and representations to communicate science ideas, methods and findings in a range of text types						

Overall comments:

Assessment Grade:

(on balance)

Marksheet

Name: _____

Mars Exploration – SHE Task

Date: _____

LI: I can explain how scientists are working together to develop Mars exploration!

157 Million Kilometers Away...



Achievement Standard		Achievement					Comments
		1	2	3	4	5	
HE1	examine the different science knowledge used in occupations						
HE2	explain how evidence has led to an improved understanding of a scientific idea						
HE3	describe situations in which scientists collaborated to generate solutions to contemporary problems						
IS8	use appropriate language and representations to communicate science ideas, methods and findings in a range of text types						

Overall comments:

Assessment Grade:
(on balance)

Background Websites:

NASA Mars Curiosity Rover Project (past and present) Website
<https://mars.nasa.gov/msl/>

2020 Mission Overview
<https://mars.nasa.gov/mars2020/mission/overview/>

2020 Science Goals
<https://mars.nasa.gov/mars2020/mission/science/goals/>

Main people involved in mission
<https://mars.nasa.gov/mars2020/mission/team/>

Entry, Descent, and Landing Technologies
<https://mars.nasa.gov/mars2020/mission/technology/entry-descent-landing/>

Recent Testing
<https://www.rdmag.com/news/2019/05/nasas-mars-2020-undergoes-tests-cleanroom>

2020 Videos
https://www.youtube.com/watch?v=TPXU_uQThGo

<https://www.youtube.com/watch?v=O9YBPRF3o5w>

Research Investigation Task:

Stage 1 – Finding overview facts

Do some research to find out about the 2020 mission:

- What is the main goal of the mission?
- What are some of the big challenges to landing a rover on mars?
- What is the atmosphere and surface of mars like?
- What is new about the Perseverance Rover compared to Curiosity?

DUE DATE: _____

Stage 2 – Writing task (500 words)

Select one of the 4 Science Goals that NASA has set for the 2020 Mission.

For your chosen Science Goal you must research and compose a mini report that covers the following:

Section	What to cover
Introduction (50)	What science goal is your report exploring? Why is this science goal important to NASA?
Science Understanding (200)	What do we currently know about this science goal? What research has been done in the past? How have scientists learned about this so far? How do they plan to find out about it?
Collaboration (150)	Explain how scientists have collaborated (worked together) from different science backgrounds to find design solutions and ideas for the 2020 rover (Perseverance). Explain how scientists have collaborated to find out about the science goal.
Career (100)	Choose one job or career that is associated with NASA 2020 mission, and explain what science that job requires and why it is important in the exploration of mars.

Requirements for writing task:

- It must be your own words. Plagiarism is not acceptable.
- You are required to use footnotes for key information that you have found. Footnote must include (1) author, (2) title of article/page), (3) web address, (4) date accessed.¹
- Use paragraph form and headings to divide each section as in the above table.

DUE DATE: _____

¹ Badger, T. 'How to use footnotes', <https://badgerfootnotestgalore.com.au>, accessed 29 March 2022.