

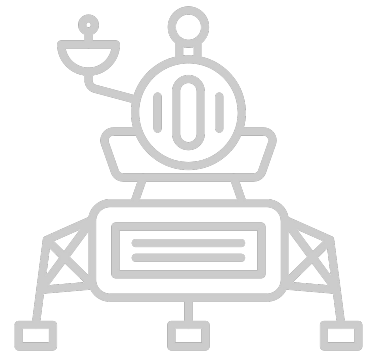
STEM STUDENT PACKET



NAME: _____

SECTION: _____

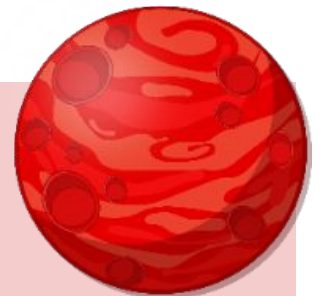
STEM #1 CHALLENGE: MARS LANDERS



Inspired by NASA Flight Director Diana Trujillo, a Colombian-American aerospace engineer who helped lead the Perseverance rover mission, your team will follow in her footsteps. Learning from the success of Perseverance's landing on Mars, your challenge is to design and build a space lander that can safely deliver your crew to the Martian surface by slowing its descent and cushioning the impact upon landing.

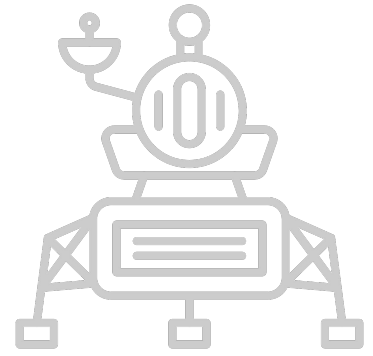
YOUR TEAM'S MISSION

Design and build a space lander to keep your two astronauts alive when landing on Mars!



Group # _____
Team Member Names

FLORIDA AND THE SPACE RACE



After watching the video “*How the Space Program launched the Florida we know today?*” , answer the following questions.

<https://www.youtube.com/watch?v=pH2HGbwFOus>

1. Why did NASA choose Florida as the place to launch rockets?

2. How has space exploration helped Florida’s economy and tourism?

STEM #1 CHALLENGE: MARS LANDERS

Planning - Research lander designs, discuss ideas and decide on materials.

Give your space lander a name: _____

Design the Prototype - Create a labeled diagram of your prototype.

Materials

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STEM #1 CHALLENGE: MARS LANDERS

Prototyping - Use the selected materials to build your lander, be aware of the constraints.

MISSION

- 2 Astronauts (ping pong balls) stay inside the spaceship (cup)
- Survive a drop of at least 60 cm measured from the lowest point of the lander

CONSTRAINTS

- Only use materials provided
- Only build **underneath** the lander
- Do not place anything inside the cup
- Do not cover the cup

Insert a photo of your finished design.

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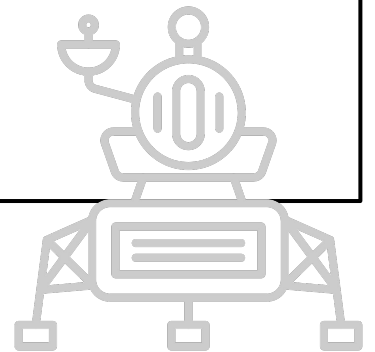
Testing - Test your landers and collect data.

Drop your lander from 60cm and record your data.

Trial	Time to reach the surface	Astronauts landed safely?	Observations
1			
2			
3			

—> *Use Numbers app to collect, organize and graph the data above.*

Areas to improve:



STEM #1 CHALLENGE: MARS LANDERS

Redesign - Reflect on the test results. What worked? What didn't? Make changes and test again.

Sketch your new design.

Retesting

Trial	Time to reach the surface	Astronauts landed safely?	Observations
1			
2			
3			

Notes:

Challenge: If your redesign works, drop your lander from a greater height!

New height : _____ cm

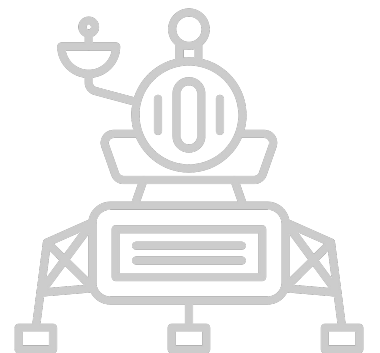
STEM #1 CHALLENGE: MARS LANDERS

Communicate Findings - Keynote

Create a **Keynote Presentation** including:

- Photos of your designs.
- Videos of your testing and explanation of the results.
- What improvements you made?
- How your final design performed?

Upload on Seesaw!



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Reflections

1. What part of your design failed or didn't work as you expected?

2. What specific change did you decide to make first?

3. How did you expect this change to help your lander perform better?
