**Mission to Mars: Space Launch System (SLS) Design Challenge**

**PART 1: IDENTIFY THE PROBLEM**

**Background:** Preparing for deep space exploration and a potential journey to Mars requires a team of scientists and engineers who are prepared to evaluate and construct the materials needed to successfully launch and transport astronauts beyond the moon. NASA is currently working to land astronauts on the moon, again, in order to prepare for a trip to Mars.

**Problem/Your Task:** You will work as a team of NASA Mechanical and Chemical Engineers who have been asked to develop a Space Launch System prototype that will launch to the highest possible height. The data you obtain will help us to evaluate the needs of the SLS rocket and its engines.

**PART 2: SLS RESEARCH**

*Visit the websites titled below (and found on the teacher page). Summarize based on the prompts provided. You may use bullet point lists to write your summary.*

**Section 1:** [**We are Going**](https://www.youtube.com/watch?time_continue=8&v=vl6jn-DdafM&feature=emb_logo)

1. How will we get to the moon by 2024?

**Section 2:** [**NASA Artemis**](https://www.nasa.gov/specials/artemis/)

1. What are goals of the Artemis program?
2. How long will it take to achieve the goals of the program?

**Section 3:** [**The SLS Rocket**](https://www.nasa.gov/sites/default/files/atoms/files/0080_sls_fact_sheet_10162019a_final_508.pdf)

1. Construct a model of the rocket that will be used to carry astronauts to the moon.
2. What do you believe are the most important structures of the rocket?

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| **Claim(s) - Most Important Structures** | **Reasoning** |
|  |  |

**Section 4:** [**The RS-25 Engines**](https://www.teachengineering.org/content/mis_/activities/mis_alloy/mis_alloy_lesson01_activity1_article_v2_tedl.pdf)

1. Describe the amount of pressure each engine will experience.
2. Since the SLS will use four, instead of three engines, what recommendations would you make regarding the mass of each engine?

**Section 5:** [**Rocket Science in 60 Seconds**](https://www.nasa.gov/exploration/systems/sls/multimedia/rocket_science_in_60_seconds)

1. Watch 5 videos that you believe are most important for your mission of achieving the highest launch height.

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| **Topic of Video** | **Summary** |
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**Section 6:** [**I am Building SLS**](https://www.nasa.gov/exploration/systems/sls/profiles.html)

1. Read the profiles of 3 individuals who are currently hired by NASA. Be sure to scroll down and click ‘More Stories’.

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| **Name** | **Job Title** | **Summary of their Work** |
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