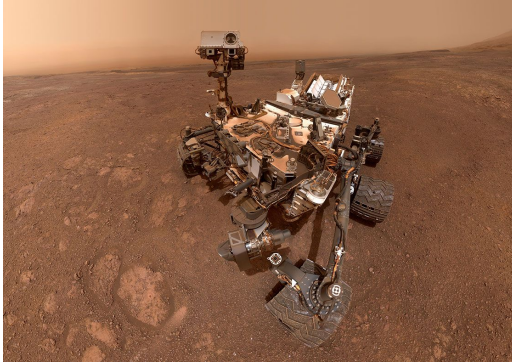


Please use the following resources to learn about Engineering Rovers

Watch this Video: <https://youtu.be/a4YqNoLkmxE>



NASA Curiosity Rover on Mars

Answer these questions:

- What are some challenges NASA faced landing the Curiosity Rover safely on Mars?
- What type of workers at NASA were important to solving these challenges?
- What are some designs seen in the video that helped Curiosity land safely? How do you protect the Rover as it is falling to the surface?

Activity: Engineer a safe Mars Lander design to land a mock-rover on Mars!

Goal: Imagine you are a NASA engineer tasked with landing the next rover safely on Mars. Our rovers will be represented by modeling clay (like Play-Doh). You've been given a budget of \$50 million to construct a lander for your rover so that it can land undamaged when dropped from a height of 8-10 feet.

Materials and their costs:

Essential: Modeling Clay (like Play-Doh), rolled into a smooth ball

Additional Materials: Gather as many of the supplies below as you have on hand. The prices are for your design purchases. For instance, you might have a pack of straws on hand, but use only 2 in your design. This would cost you \$2 million out of your \$50 million budget.

2 pipe cleaners	\$1 million	30 cm of tape	\$6 million
1 straw	\$1 million	1 baggie	\$7 million
1 piece of paper	\$2 million	Scissors	\$8 million
1 balloon	\$5 million	1 paper cup	\$10 million
30 cm of string	\$3 million	15cmx15cm piece of bubble wrap	\$4 million

Instructions:

1. Design a lander to protect your clay rover using only materials “purchased” with your \$50 million
2. Construct your lander around your clay rover
3. Test your design! Ask a parent for help to drop your lander from 7-10 feet. Was your clay rover damaged upon landing or did your design protect it?
4. Adjust your design (still staying under budget) and try again!

Make observations & use Claims, Evidence, and Reasoning!

1. **Claim:** Lander designs are limited by available funding and usable materials.
 - **Evidence:**

 - **Reasoning:**
2. **Claim:** Each material serves a different purpose, but some are better at protecting against impact than others.
 - **Evidence:**

 - **Reasoning:**