



GEARING TOWARDS THE FUTURE

Presented By **Honeywell**



GEARING TOWARDS THE FUTURE

Science, Technology, Engineering and Math! Barrett-Jackson, The World's Greatest Collector Car Auctions, is partnering with Arizona SciTech Institute to bring you Gearing Towards The Future — a community, education and outreach initiative focused on STEM education.

Barrett-Jackson's Gearing Towards The Future aims to encourage and develop future automotive engineers and technicians through age-appropriate STEM challenges focused on teaching students how to solve problems and develop new skills using real-life scenarios related to automobiles.

2024 CHALLENGES

Grades K-5

Create a Mars Rover That Can Navigate the Martian Terrain
Presented by Arizona SciTech.

Grades 6-8

Design and Build an Advanced Air Mobility Vehicle Presented by Honeywell.

Grades 8-12

Life Cycle Analysis, Energy Engineering and STEM Careers in Dairy Production Presented by Arizona Milk Producers.



<https://stem.barrett-jackson.com>

CREATE A MARS ROVER THAT CAN NAVIGATE THE MARTIAN TERRAIN

Congratulations, young engineers! NASA has selected you to design and build a prototype Mars Rover to explore the Red Planet, Mars. Your mission is to create a Mars Rover that can navigate the Martian Terrain.



Option 1. Balloon Powered Mars Rover

Design a balloon-powered Mars Rover capable of traveling one meter distance on a simulated Martian surface. How can your Rover overcome obstacles?



Option 2. Magnet Powered Mars Rover

Imagine your Mars Rover powered by magnets! Design a rover that utilizes magnetic forces to move across the Martian surface. Think about how magnets can help your rover navigate along the surface of Mars.



Option 3. Recycled Materials Mars Rover

In this eco-friendly challenge, use recycled materials to construct a Mars Rover. What features will make your Rover resilient and navigate the rocky terrain of Mars?

Safety Crash Test with Mars Rover: Once your Mars Rover is built, it's time to ensure its safety during the landing on Mars. Set up a scenario where your Rover will be going down a slope to simulate the Martian rocky surface. How well does your design protect the Rover's astronauts? navigate the Martian Terrain.

Engineering Design Thinking: Project must demonstrate the use of the Engineering Design Process and include evidence of each of the following elements:

1. *Identify:* What is the problem you want to solve with your rover?
2. *Brainstorm:* Brainstorm what your vehicle could look like.
3. *Select a Design:* Choose a plan that your teammates come up with. Sketch the plan for your vehicle.
4. *Build:* Build your rover using the materials on the list
5. *Test and Evaluate:* Test your rover by going through a crash test. Evaluate & add notes to your plan.
6. *Optimize:* Redesign your rover based on your notes.

Materials List: This challenge is designed to be cost-effective for both teachers and students. Below, you'll find a list of recommended items to construct the rover and ramp. Please explore your classroom (or house!) for recycled materials or utilize resources readily available in your classroom (or house).

- Ramp - Books, whiteboards, cardboard, etc. Ramp should simulate the Mars surface - crumple up paper and bottle caps to represent paper on the ramp
- 4 Astronauts - Pipe cleaners, clay or playdough,
- Bottle Cap, Lego, Printed
- Plastic Bottles
- Paper Cups
- Paper Clips
- Straws
- Rubber Bands
- String
- Paper Clips
- Tape (Masking, Duct)
- Scissors
- Markers or Paint
- Balloons
- Plastic Drinking Straws
- Magnets
- Metal Washers
- Recycled Materials: bottle caps, paper scraps, or small plastic containers etc
- Old CDs or DVDs
- Egg Cartons

