Roper Mountain Science Center

Pre-Visit/Post-Visit Guide   *Lesson Name: Explorabotics-*
                                                Mars Mission- X

Summary of Lesson:

The mission to Mars starts now! Students will work as international space agency teams to complete their mission to survive on Mars by exploring position, direction and speed. Using programmable LEGO robot technology, student teams will work collaboratively to collect and analyze data to program their rover to design a solution to complete their missions. Students will engage in hands-on problem-solving, computational thinking and the engineering process to complete their mission to survive on Mars!

South Carolina Science Standards- Science Standards: 5.P.5A.1; 5.S.1A.5; 5.S.1B.1

Pre-Visit Resources
- Teacher/Chaperone Expectations: Please help us by letting us know of any special accommodations for your children prior to the lesson. Students will be working in pairs or in groups of 2 as needed. Your assistance with classroom management and distribution of lesson materials will also be greatly appreciated.
- Key Vocabulary: position, direction, distance, time, speed (velocity), computer programming, coding
- Key Questions Addressed in Lesson: What is speed? How do we analyze speed data? How do we use the position of an object and its motion to determine its final location? How do we use computational thinking to program a robot?
- Content Preview Video: This is NASA's video which describes the inspirational engineering steps to design, build and program equipment to get the Curiosity Rover to Mars : https://www.jpl.nasa.gov/video/details.php?id=1090

Post-Visit Resources
- Writing Prompt: Imagine that you were a researcher at an outpost on Mars, choose one of the missions (drilling, generating oxygen, extracting and treating water, generating power with solar panels, building a habitat to live, or building a habitat to grow plants and food), and describe the steps you would take to successfully complete your mission.
- Possible Lesson Link: https://mars.nasa.gov/mer/classroom/roverquest/lesson01.html
  - To allow students to gain experience in the use of maps, measurements and observations to determine location of objects.
  - REAL-WORLD APPLICATION: To demonstrate how objects can be located with precision accuracy when distances are great (e.g. millions of miles away).
- Video Link:
  - A real robot on Mars: https://www.youtube.com/watch?v=1Ll-VHYxWXU