VIRTUAL MISSIONS

Mission Goal:
Build new satellite technologies to monitor data from Earth.

Earth-monitoring sensors on the International Space Station are outdated and need to be replaced with new, state-of-the-art hardware.

Your students will work together to program robotic arms, capture a cargo craft using a robotic arm, monitor astronaut vitals during a spacewalk as they install new sensors, and collect and analyze data from Earth-monitoring satellites. The new sensors will collect data on Earth processes and events taking place on our planet.

As crew members complete mission objectives, they'll communicate with each other while monitoring real-time events occurring on Earth. It's critical the crew maintains communications so they can respond to any emergencies should they arise.

Crew members will help protect people and the environment by monitoring global events and predicting outcomes. The data retrieved from this mission are critical for scientists as they continue to investigate Earth and how it is changing.

What to Expect

- Approximate program time: 1 hour
- Delivered in real-time by Challenger Learning Center Flight Directors
- Closed captioning available
- Next Generation Science Standards (NGSS) aligned
- Common Core State Standards (CCSS) aligned

Featuring
Kenneth Harris II
Senior Project Engineer,
The Aerospace Corporation

In our interactive Observation Earth simulation, students are placed into teams to conduct research and collaborate to find solutions to urgent challenges, while experiencing real-world STEM careers.

Suggested Grade
6-8

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Devices with audio/video capability and internet connection are required for our software program. Program delivered using video conference technology. No personal student data is collected.

www.challenger.org/programs/virtual-programs

Teams:
Teamwork is critical to our mission. Each student is assigned to a team and works with their small group to complete their research and analysis.

Life Support

Objectives:
Explore components of Spacecraft and spacesuits, monitor astronaut vitals during the spacewalk, and apply critical thinking and decision-making skills to design a functional spacesuit within a budget constraint.

Branches of Study:
Engineering, Materials Science, Biomedical Science

Career Connections:
Aerospace Engineer, Mission Specialist, Medical Doctor

Geology

Objectives:
Analyze geological processes occurring on Earth by using satellite imagery to collect data, plot event locations, construct timelines, and predict outcomes.

Branches of Study:
Earth Science, Environmental Science, Remote Sensing

Career Connections:
Meteorologist, Climate Scientist, Geologist

Robotics

Objectives:
Analyze the structure and function of robotic arms, apply geometry to program Spacecraft's robotic arm to capture the cargo craft, and explore potential enhancements and adaptations for tools used by astronauts and robotic drones.

Branches of Study:
Engineering, Robotics, Computer Science, Mathematics

Career Connections:
Robotics Engineer, Mission Specialist, Software Engineer

Communications

Objectives:
Collaborate with all mission teams to lead and communicate critical messages during the mission. Establish connections with Earth-monitoring satellites, lead communications with the general public, and conduct press releases and Spacecraft downlink sessions.

Branches of Study:
Communications, Public Relations, Communications Technology

Career Connections:
Flight Director, Satellite Engineer, Communications Engineer

Learning Objectives

- Study Earth processes and events, both natural and anthropogenic
- Apply geometric calculations to real-world problems
- Collaborate with peers to achieve a common goal
- Enhance scientific vocabulary

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Observation Earth was developed in partnership with Challenger Learning Center at Wheeling University.
Pre- and post-mission activities were made in partnership with NASA and the National Institute of Aerospace.

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