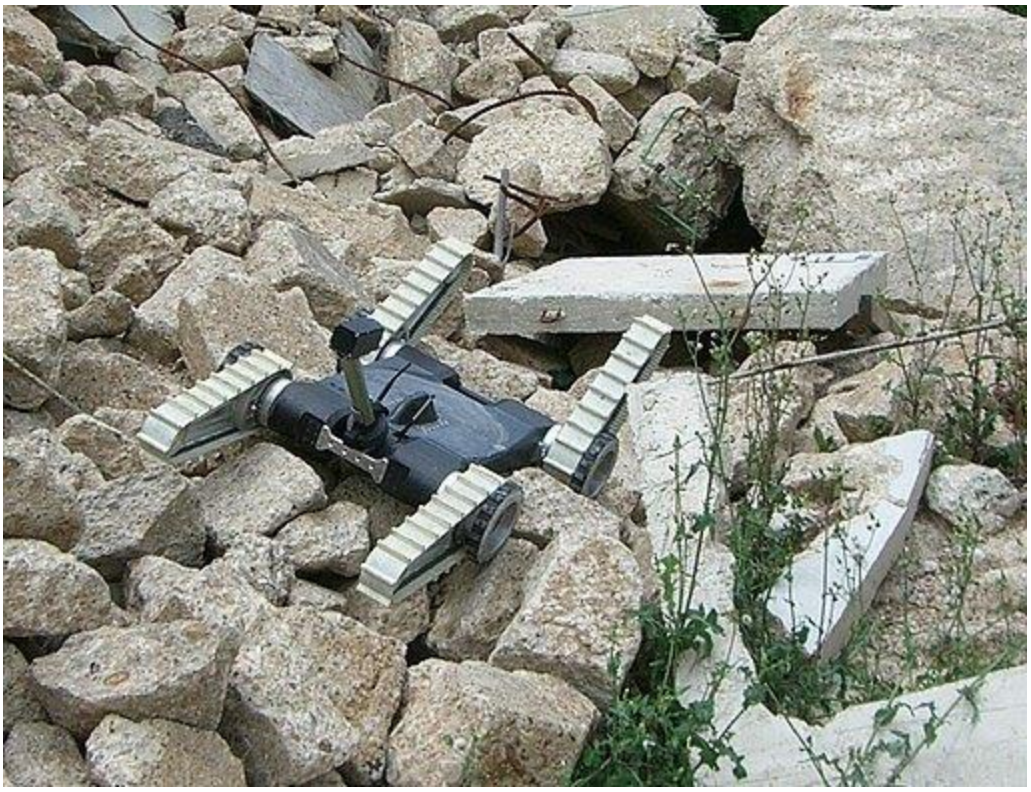
Exploration and Rescue Robots

Today's robots have the ability to complete many complicated tasks and can be used to help solve 21st Century challenges. Many of today's robots have to have the ability to maneuver through difficult terrain and unknown passages. These robots are quicker, more efficient, and can travel in places that humans cannot. This technology is used to aid in exploration of difficult terrain, and even help with search and rescue missions.

A Dragon Runner Robot moves through the desert
Photo: Steve Dock/MOD [OGL v1.0 (http://NationalArchives.gov.uk/doc/open-government-licence/version/1/)]

Exploratory robots are essential when scientists are investigating uncharted areas, such as oceans, caves, and other planets. These robots are designed to be durable in harsh conditions including in water and deep, dark areas. Exploratory robots can map these areas, take soil and air samples, and detect other hazards that would put people at risk if they were performing the same actions. Some of these robots are even used in space. The Mars rovers use many camera sensors to take pictures that are instantaneously converted into 3D maps that the rover will use to avoid obstacles in its path.

Today's exploratory robots have the ability to complete many complicated tasks, such as the Dragon Runner Robot. This robot uses many operations and movements to find and remove dangerous items to keep people safe.



An urban search and rescue robot moves across a rubble pile
Photo: NIST [Public domain in the United States]

Search and rescue robots are sent into hazardous areas to help locate people and bring them to safety. Finding people faster can save their lives, especially if they have serious injuries, by bringing much needed assistance to them.

Today's robots have the ability to complete many complicated tasks. However, robots didn't start out being able to carry out complicated programs. The very first robot, the Unimate, was created by General Motors to work in a factory in 1961. It was programmed to complete very simple movements, like moving forward and backward, in order to move pieces of hot metal on an assembly line. Over time, engineers have developed robots to be able to complete tasks that benefit humans in many ways. These advancements have led robots to become widely used in our communities. Some of the many benefits of exploratory robots include:

- ➔ They are capable of lifting heavy loads without injury.
- ➔ They are more precise in their movements.
- ➔ They can perform tasks that are dangerous to humans.
- ➔ They can work in hazardous conditions, such as poor lighting, toxic chemicals, or tight spaces.

Discussion:

- How can exploratory robots be used to help us understand and slow down climate change?
- What are some areas of research in which exploratory robots can improve on human efforts?
- How does the environment in which an exploratory or rescue robot must perform influence how the robot is designed or programmed?
- What are some environments in which rescue robots could perform more effectively than humans to bring people to safety?