Robots in Hazardous Environments

Robots are machines that help people by doing work for us. In our Introduction to Robotics session, which you might like to try before this one, we learnt about three different kinds of robot:

1. Unmanned **Ground** Vehicles (robots on land)
2. Unmanned **Aerial** Vehicles (robots that fly)
3. Unmanned **Marine** Vehicles (robots that swim)

What kind of jobs can robots do for us?

The jobs that people find boring, the jobs that are too messy, and the jobs that aren't safe for people to do. These are known as the 3 Ds:

Dull. (Boring)
Dirty. (Messy)
Dangerous. (Unsafe)

Dangerous places robots can go

Space - The surfaces of other planets aren't very friendly places. They can be too hot or too cold and don't have the right air for us to breathe. Plus, they're a very long way away. So we send robots to these planets to help us understand them better.

Image: Pixabay on Pexels.

Nuclear power stations supply our homes with electricity, but they need dangerous materials and chemicals that give out lots of radiation to work. When they need fixing or demolishing, engineers use robots to do the work and handle the materials and chemicals that could hurt people.

Rescue - Robots can be used to rescue people from dangerous places. This could be during natural disasters such as earthquakes or floods, or when a building is too dangerous for human rescuers to enter.

Image: National Institute of Standards and Technology, Public domain, via Wikimedia Commons

Volcanoes are important landforms that can tell us more about our planet. However, some of their features are not safe or accessible for people to explore (they might be too narrow for a person to get into, for example – you can find out how a scientist solved this problem with robots here from Raspberry Pi) and it can be too dangerous to get close to an erupting volcano.

Image: Steve Dock, OGL v1.0, via Wikimedia Commons
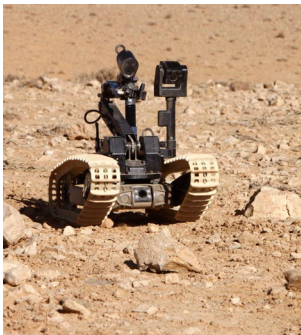
Bomb Disposal - After a war, there may still be bombs or explosives that have been left behind on the ground. Robots are often used to find and get rid of these bombs and explosives, so that people don't get hurt by them.

A robot equipped with a firefighting cannon. Image: Abeborah at Portuguese Wikipedia, Public domain, via Wikimedia Commons.

Fires can damage a lot of land, burn down houses and be very dangerous to fight. To keep firefighters safe, robots have been fitted with hoses and other tools to help fight these fires, whilst the firefighters can stay a safe distance away.

Minecraft Challenge

Build a dangerous environment using one of the examples you have read about in this activity. Here are some things to think about when making your environment in Minecraft:

- Which kind of robot would you use to investigate in that place?

Image of a rocket and launcher built by a Minecraft Club participant.

- How will the robot get in and out of the environment to explore?

- Can you think of any special tools the robot might need?

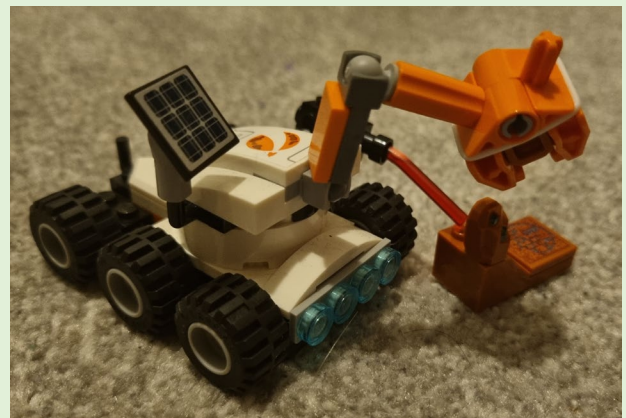- Make your robot move use redstone. You can watch 'redstone basics' video here.

Image of a Mars rover made in Lego by Thomas Murray

If you don't have Minecraft you could build your own model robot to explore hazardous environments out of simple materials e.g. building blocks, plasticine, clay or papier mâché.