

LAVA TUBE EXPLORATION





Next Giant Leap: Lava Tube Exploration

Objective:

Students drive and program a Sphero Robot to navigate through a pathway of cones, simulating the exploration of lunar lava tubes below the surface of the Moon.

Materials Needed:

- ✓ Sphero Mini Robot
- ✓ Play Cones
- ✓ Tablet

Summary of Student Action:

Lava tubes are hollow subsurface cave features that once allowed magma to flow during volcanic activity. Lava tubes have been discovered on the Moon, and it is theorized that humans could use these tubes as locations for habitats to avoid exposure to radiation and extreme temperature fluctuations. However, for this theory to be confirmed, the lava tubes must be deemed safe for human exploration by rovers. Students will simulate the exploration of a lava tube by a rover using cones and a Sphero Robot.

Setup Instructions:

- Download the Sphero App onto the tablets and place them at the station within reach. <https://edu.sphero.com/d>
- Place the Sphero Robots at the station within reach.
- Place the cones on the floor and arrange them in such a way to create a pathway. Similar to the path that a lava tube or cave might make.
- Designate a starting point and ending point.

Additional Notes:

As an option, allow students to arrange the cones into paths as they see fit to make their own “lava tubes”. Encourage younger participants to use the remote-control feature in the app that allows for direct control. Encourage older participants to use the programmable feature for more exposure to computer programming and coding.



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Lava Tubes have been Discovered on the Moon

Your task: Use a Sphero Robot to explore Lunar Lava Tube.

You will need:

- ✓ Sphero Mini
- ✓ Play Cones
- ✓ Tablet

Procedures:

1. Arrange the cones on the floor near the station to make a path that resembles a lava tube or cave.
2. Use the tablet to control the Sphero Robot and navigate through the lava tube.
3. Try to program the Sphero to navigate through the lava tube without your direct control