Robot Space Explorers in Night Sky Museum - Educator's Guide (Ages 8-11)

At the end of these Night Sky activities students will understand:

- Most spacecraft do not carry people
- Explorer 1 was the first scientifically productive satellite
- Planetary rovers can explore larger areas than landers
- Uncrewed space missions are cheaper, less complex and safer than crewed missions

Astronomy background information

In this activity your students can explore some of the robotic space vehicles in the Night Sky Museum. The vast majority of spacecraft sent into space do not carry human beings. Humans need living space and protection from the radiation and temperature variations of space. A crewed spacecraft must carry 5.5 lb (2.5 kg) of food, up to 0.8 gallons (3 litres) of water and 2.2 lb (1 kg) of oxygen per person for each day. Uncrewed spacecraft can be much smaller and cheaper than spacecraft with people on board.

Two of the first satellites placed in orbit are included in the Museum. Sputnik 1 was the first satellite. It did not carry any scientific instruments, just a radio transmitter to announce it was in the sky. In contrast, Explorer 1 used its built-in Geiger counter to detect unexpectedly high radiation levels. This came from the Van Allen Radiation Belts around the Earth. The Belts were the first major discovery made by a spacecraft.

Spacecraft have made soft landings on some of the moons, planets and asteroids in the Solar System. Landers like InSight in the Museum are equipped with rocket motors and three or four legs with footpads to make soft touchdowns on surfaces. Most landers carry cameras, sampling arms and other instruments. However, as they cannot move after landing they can essentially only explore a zone within a few yards of the landing site. Some landers can deploy rovers. These are wheeled spacecraft that roam for large distances, hugely expanding the exploration area.

Accessible Learning:

- Text size can be increased in the Preferences section

- Star numbers can be reduced by sliding two fingers down the screen

Night Sky App Essential Settings
No essential settings are required for this activity.

NOTE: Night Sky Museum requires a subscription to Night Sky+