To create a sustainable lunar outpost, people living and working on the Moon will learn to live off the land, utilizing local resources in place of materials from Earth.

**Figuring Out What’s Where**

Geophysical sensors onboard spacecraft provide data about the materials on the Moon’s surface. This information helps us better understand the processes of how the Moon formed and has changed over different ages. Scientists and engineers can now study missions and locate areas for future missions. What resources does the Moon offer and how will we use them?

**Soil** Solutions

Cowpats igneous rocks have pulverized the Moon’s rock and created a layer of lunar ‘soil’—regolith—on the surface. Regolith can be a useful resource! Astronauts may extract oxygen from regolith to make breathable air. They may cover lunar habitats in regolith to protect themselves from dangerous solar and space radiation.\n
**Metals from the Moon**

Iron and titanium harvested from basalt rocks, and aluminum from lunar highland rocks, can be manufactured into materials for buildings, rovers, and solar panels.\n
**Water at the Poles?**

Data from spacecraft missions suggest that water ice may exist at the Moon’s poles. Because the poles are not tilted toward the Sun, sunlight never reaches the bottom of the deep craters. They are permanently dark and very, very cold. Water ice, perhaps delivered by comets, may be trapped in the craters. Water is an important resource for future outposts not only for drinking, but also because hydrogen and oxygen, the elements that make up water, can be separated and used to make fuel.

**Reduce, Reuse, Recycle**

Astronauts need to use their resources carefully. Shipped materials from the Earth to the Moon will be expensive, costing more than $20,000 per pound! Existing and new technologies such as water recycling, robotic activities, and the use of fuel cells to produce electricity will help conserve resources.

**Solar Energy**

A Renewable Resource

With sunlight lasting 18 Earth days, sunlight can be collected, stored, and used to power the outpost, providing energy for lighting, instruments, and life support. Crater rings at the Moon’s polar regions receive sunlight for even longer periods.

By living and working on the Moon, we will develop the skills and technologies we need to explore our solar system.