**Seeing More**

To characterize materials on the Moon, scientists use reflectance spectroscopy, a measure of the amount of electromagnetic radiation at different wavelengths that reflect from the Moon's surface. We can see some electromagnetic radiation — our eyes detect visible light. The different colors we see are from different wavelengths. Spectrometers are special instruments that also detect different wavelengths of light. They can measure what our own eyes see and more, including ultraviolet light, infrared radiation, and beyond!

**Mineral Fingerprints**

Many of the rocks on the surface of the Moon may look similar, but they contain different minerals or amounts of minerals. Each mineral reflects very specific amounts of the different wavelengths of electromagnetic radiation, so each mineral has a characteristic spectrum of reflected light — a spectral fingerprint.

**Expanding the Whole Moon**

Spectrometers on board spacecraft collect data as they pass over different areas, allowing scientists to gather spectral data from the entire Moon.

**Matching Fingerprints**

Scientists examine the spectral data collected from the Moon's surface and compare these measurements to spectral curves gathered from lunar soil and Apollo rock and mineral samples. This comparison allows scientists to determine how much of each mineral is present at a location on the Moon's surface. Using spectral measurements, scientists can create a very detailed map of the mineral and chemical composition of the entire Moon — without collecting more rocks from the surface.

Spectrometers and other special instruments onboard orbiting spacecraft help scientists discover more about our Moon than our eyes alone can detect. Knowing where different rocks and minerals and chemical elements are located on the Moon will help us plan our future exploration.