Try This --- Make an Impact

Students model impact events and develop an understanding of the processes that cause cratering on the lunar surface.

What's Needed

An image of the Moon (example: http://photojournal.jpl.nasa.gov/jpegMod/PIA00405_modest.jpg)

For each group of 4–6 students:

- A sturdy box at least 2' × 2' wide and 6" deep
- Sand or oatmeal to fill the box to a 3" depth
- Flour to cover the sand to a 1" depth
- Cocoa to cover the flour to a 1/8" depth
- Several impactors of different sizes and weights (marbles, pebbles, golf balls, etc.)
- Eye protection

Prepare the impact box with a bottom layer of sand or oatmeal, a middle layer of flour, and top layer of cocoa. Smooth each layer before you add the next layer.

Getting Started

Show the students an image of the Moon.
What features do they observe?
Do they see the large round areas that have smooth dark interiors? Do they see smaller circular features?
How might these have formed?

What to Do

- Invite the students to drop an impactor into the box. ***What do they observe? Can they identify different features of the crater? How do craters help geologists "see into" the inside of a planet?***
- Experiment by dropping an impactor from different heights, simulating different velocities of incoming impactors. ***How did impactors traveling at different "velocities" influence the crater size or distribution of ejecta?***
- Experiment with different impactors dropped from the same height. ***Do the crater sizes or depths change?***

Wrapping Up

Return to the images of the Moon. Discuss how impact basins and craters form. When meteoroids strike the Moon, they create a circular depression and eject material onto the surrounding landscape. What remains is a crater, surrounded by a raised rim, and a debris blanket of ejecta. Sometimes the debris can be seen as long, bright rays radiating great distances from the crater. If a crater is greater than 185 miles (300 kilometers) in diameter, it is called a "basin." Different basin and crater sizes result from different sizes and velocities of impactors. The larger and faster the impactor, the larger the crater that results.

Invite the students to observe the Moon. ***Can they identify impact basins, craters, and rays?***

This activity can be made more quantitative by having students carefully perform the experiments and measure the resulting crater dimensions. An expanded classroom lesson plan can be found in NASA's Exploring the Moon Teacher's Guide.