



## Moon, Mars, and ISS



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Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_ Exercise# \_\_\_\_\_

### Craters (Lab) Student Worksheet

#### Background Information:

Impact craters are the remains of collisions between an asteroid, comet, or meteorite and the Moon. These objects hit the Moon at a wide range of speeds, but average about 12 miles per second (20 kilometers per second).

The surface of the moon is scarred with millions of impact craters. There is no atmosphere on the moon to help protect it from bombardment from potential impactors (most objects from space burn up in the Earth's atmosphere). Also, there is no erosion (wind or water) and little geologic activity to wear away these craters, so they remain unchanged until another new impact changes it.

The size, mass, speed, and angle of the falling object determine the size, shape, and complexity of the resulting crater. Small, slow objects have a low energy impact and cause small, simple craters. Large, fast objects release a lot of energy and form large, complex craters. Very large impacts can even cause secondary cratering, as ejected material falls back to the ground, forming new, smaller craters, or a series of craters. Most of the craters on the Moon are circular. Lunar craters with a diameter over about 15 kilometers have more complex forms, including shallow, flat floors made of solidified lava, central uplifting (a single peak, multiple peaks, or a ring), and terraces on the inner-rim walls.

#### Materials:

Pie pans	Metric ruler
Flour	Meter stick
Cocoa	Newspaper
Sifter/Shaker	Safety Glasses
Marbles	

#### Procedure:

1. Cover the floor with newspaper.
2. Fill the pie tin with an even layer of flour (4-5 cm).
3. Using the sifter/shaker, cover the top of the flour with a light dusting of cocoa.
4. Place the pie tin on the newspaper and place your meter stick, with the zero end down, on the floor by the pie tin.
5. Put on your safety goggles. Drop 3 marbles into the pie tin from the 30 cm height.

6. Choose a crater. Measure, in metrics, the diameter and the depth of the crater using your ruler. Record the information on your Data Collection Chart. Draw a picture of the crater.
7. Remove the marbles.
8. Smooth out the flour.
9. Repeat steps 4-6 using the heights of 50 cm and 90 cm.

**CAUTION: The next part of the experiment can either be teacher demonstrated or student performed. Check with your teacher!**

10. Drop a marble into the pie tin using some force. Record your measurements.
11. Throw a marble into the pie tin so that it strikes the surface at an angle. Record your resulting measurements.

### **Conclusions**

1. How were the craters different when the marbles were dropped from different heights?

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2. Are the craters in step 10 different from the rest? How?

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3. Are the craters in step 11 different from the rest? Why?

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### Data Collection Sheet

Type of Meteoroid Strike	Depth of Crater	Diameter of Crater	Drawing of Crater
30 cm			
50 cm			
90 cm			
From above With force			
At an angle			