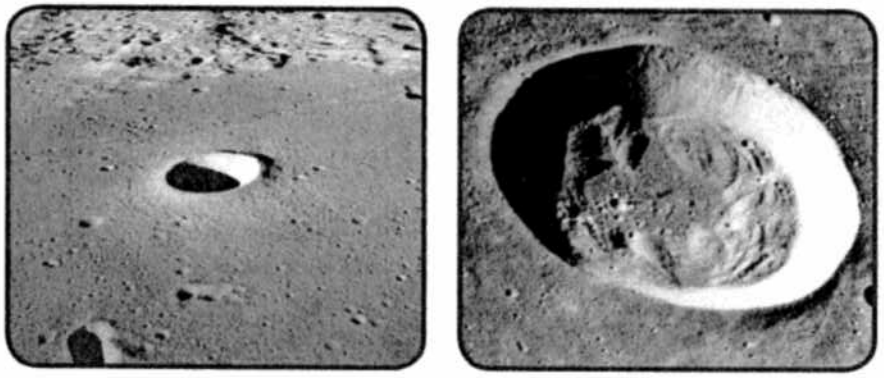
Reading 2.1 – Impact Craters

Getting Ready

Look at the photos of impact craters on the moon. The right one is called the Bessel Crater. Its diameter is 16km. The left one is called the Moltke Crater. It has a diameter of 7km. You can see many other small impact craters. Why do you think the craters are such different sizes?



In this reading, you will learn more about factors that affect the size of craters, and you will read about a way to investigate this at home.

Impact Craters

Impact craters form when objects from space fall on the surface of a planet or a moon. These objects could be asteroids, comets, or pieces of either one. When the objects hit the surface, they are called meteorites. Meteorites create craters, which are large depressions in the ground.

The surface of the moon is covered by impact craters of many sizes and shapes, like those in the pictures. The diameter of most craters is about ten times greater than the diameter of the meteorite that made it. Some meteorites are as small as a fingernail. When a meteorite hits the ground, the impact can be tremendous. Many meteorites actually explode on impact, or they explode just above the surface. When that happens, they leave nothing visible except a crater. Although most meteors are tinier than your fingernail, they have a lot of kinetic energy. Why?

Are There Impact Craters on Earth?

Both Earth and its moon are bombarded by lots of tiny meteors all the time, but the atmosphere prevents most of them from reaching the ground. In the past, there were many impact craters

on Earth, but they were worn down by wind erosion. The moon has no atmosphere to wear down its craters, which is why the impact craters are still visible. About 150 impact craters have been recognized on Earth. One of these is Meteor Crater in Arizona. Workers in the crater area discovered fragments of the meteorite within the impact crater itself.

Investigating Impact Craters

In class, you learned how the speed and mass of an object influence its kinetic energy. When you threw down a tin can, you gave it greater speed than when you just dropped it. Throwing the can compacted the modeling clay more than dropping it did. A heavy tin can compacted the modeling clay more than a light can. If you drop any hard object on snow or on sand, you can create small impact craters similar to those created on the moon. Design your own experiment and create impact craters at home.

Try this activity:

- Fill a pan with sand to a depth of about 2.5cm. Smooth the surface. Then tap the pan lightly a couple of times so the sand settles evenly.
- Take the pan outside, or set it on newspaper or a large towel.
- Choose two marbles or small rocks. One should be heavier than the other.
- Plan an experiment to investigate how the mass or speed of the marble influences the crater's size.
- Answer the following questions. Then, report the procedure and results of your experiment.

1. What is the purpose of your investigation?

2. Which variables you will hold constant?

3. Which variables will you change in a controlled manner?

4. Which variables will you measure to determine the influence of those that you have changed?

How did you carry out the experiment? What were your results? What is your conclusion? How is your conclusion related to energy?