

Recreate an Asteroid Impact

In this activity, children will model an asteroid impact and record information about the craters they create. Scientific models help children develop their understanding of how the world around them works.

Impact craters are caused when an impactor (a meteorite or asteroid) collides with a planet or moon. A crater's size and shape depend on the mass and velocity of the impactor. Scientists use craters to learn about the geology and age of the surface of planets and moons.

Resources needed:

- A large, high walled container (needs to be at least 5cm centimeters deep). The larger the better!
- Marbles or other small round objects such as ball bearings, golf balls, or wooden balls.
- Any dry powdery material. It's important to create different layers so make sure you use at least two different colours. We recommend sand or flour, and powder paint or cocoa powder.
- Something to protect the floor around the container from any mess.
- Ruler or meter stick (optional).
- Sieve (optional)
- Safety goggles.

Preparing the equipment:

- Fill your container with a base layer of powder about 3 cm thick.
- Sprinkle a fine layer of a contrasting colour powder on top. You can use a sieve.
- You can now recreate an asteroid impact by dropping the round object into the tray.
- Please ensure that all participants wear protective eye goggles during this experiment.

Carrying out an investigation:

Younger children could draw and label the craters they make, using the image on Page 2 for guidance. They could also count the number of "rays" (*see image on page 2*), observe whether they can see all the different colored layers, and compare their craters to images of craters on the Earth or Moon.

Older children could plan and carry out an experiment. There are a variety of **independent variables** that can be used. Children can also decide what **dependent variable** to measure and record in their results. We have suggested some variables to choose from on Page 2.

Encourage children to think about **fair tests** when planning their experiment - what are the **control variables** and how will they make sure they are the same each time. A common error is to throw the object into the container, rather than drop it.

Independent variable suggestions:

- Mass of object (requires a variety of objects to drop into the container)
- Height from which object is dropped

Dependent variable suggestions:

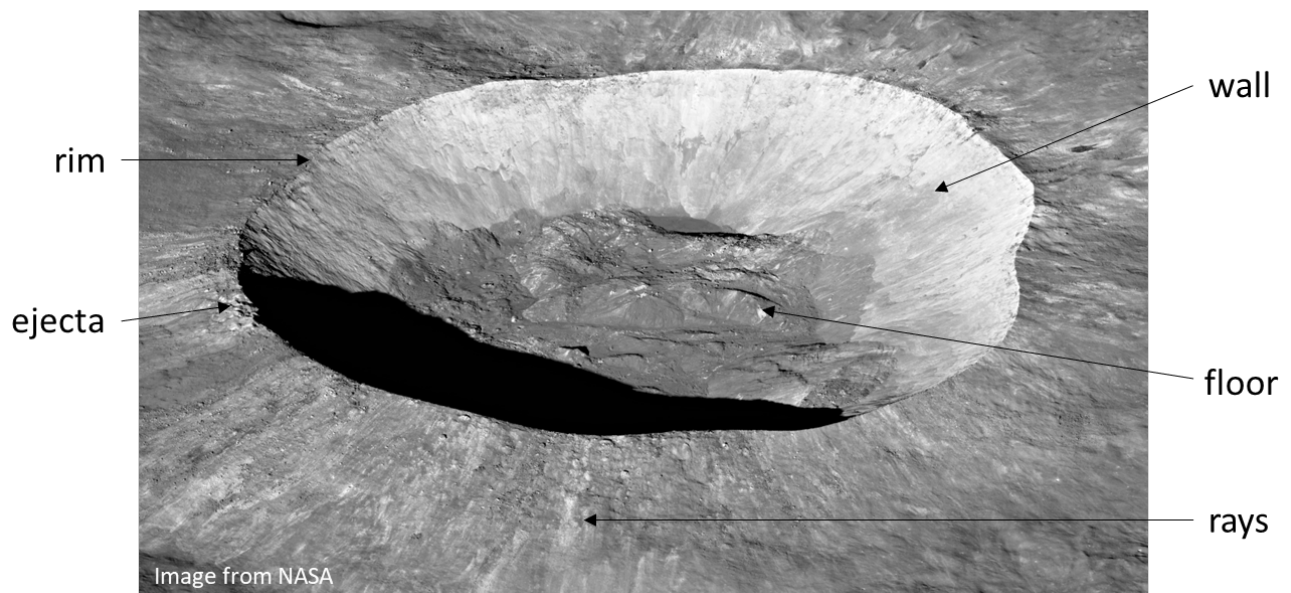
- Diameter of crater
- Depth of crater
- Shape of crater
- Number of ejecta rays
- Length of longest ejecta ray

Working Scientifically:

- Ask children to **predict** what the relationship will be between their independent and dependent variables.
- Encourage children to be **accurate in their measurements**. They may want to practice dropping the object before they start collecting their data.
- Children can **record their results** in tables and plot them on graphs.
- Children could repeat the experiment several times and **calculate average results**. Encourage discussion about why scientists repeat experiments.

What children should see:

Features of an Impact Crater



- The impactor has made a depression in the material, called a “crater”.
- The shape of the crater includes steep ‘crater walls’, leading to the circular ‘rim’.
- The coloured layer shows the patterns created by the ‘ejecta’. Ejecta is material thrown out of the crater on impact.
- Long streaks of ‘ejecta’, sometimes thrown long distances from the crater, are called “rays”.