

## IMPACT CRATERS

Use objects from around your home to create your own impact craters- just like those we can see on the moon

### Overview



Have you ever wondered how those holes on the moon got there? They are impact craters and are formed when meteors (lumps of ice and rock) crash into the surface of a larger solid object like a planet or a moon. You can investigate your own impact craters at home using balls, a bowl or tray and some sand, soil or even flour!

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### What you'll need

- A variety of balls, marbles or beanbags (or any toys that can be dropped from a height without being damaged).
- A large bowl or tray with sides.
- Sand, soil, flour or similar powder.
- A ruler and pencil or pen and paper if you want to record your investigation.

### What to do

#### Step 1



Collect your objects for testing. Fill your bowl or tray with sand, soil, flour or the powder you are using. Smooth the surface so that it is flat.

### Duration

20 minutes or so.

### Suitable for...

Age 3 and up.



## Step 2



Put your bowl or tray onto the floor.  
Drop your first object into it.

## Step 3



Carefully, take the object out of the hole it has made, without disturbing the surface around it. You have made your first crater!

## Step 4



One at a time, drop all of your objects into your bowl or tray. Carefully, remove the objects to observe your craters. Try to drop each object into it's own space so that your don't destroy your earlier craters.

## Step 5



When you run out of space for craters in your bowl or tray, smooth the surface

## Safety notes

You know your children better than anyone, and you should judge whether they're ready for this activity. You might want to think in particular about:

- Supervision: if you are using marbles, the activity involves small parts, so there's a choke hazard.
- Ensure feet and other body parts are away from the dropping and impact area.
- Ensure children don't climb on unsafe surfaces to drop their objects.

## Careers link – Geologist

Geologists work to understand the history of our planet so that they can predict how events and processes of the past might influence the future. Geologists study past climates of Earth and how they have changed across time. This provides an understanding of how our current climate is changing and what the results might be. They also study the age of rocks, attempting to piece together a timeline of events for



over so that it is flat and start again.



## Things to discuss

- Do big objects make big craters?
- Do small objects make small holes?
- Do heavy objects make deeper holes?
- What happens if you drop the object from higher up?
- What happens if you drop the object from lower down?

## Measuring your craters



To find out how wide your craters are, you need to measure their diameter. To do this, measure across the top of your crater at the widest part of your circle rim.



Most rulers have a gap between the edge of the ruler and where the measurements start. To find out how deep your craters are, you need to push your ruler right into the surface so that zero on your ruler is level with the deepest part of your crater.

| Object      | Width of crater | Depth of crater |
|-------------|-----------------|-----------------|
| Bouncy ball | 6cm             | 2.5cm           |
| Golf ball   |                 |                 |
| Marble      |                 |                 |
| Penny       |                 |                 |

You might want to record your results on a table. Can you drop your different objects from the same height to make this a fair test?

the formation of the Earth's land masses and changes over time. Astro-geologists are geologists that study the geology of other planets.

**Attributes:** observant, curious, creative

## Asteroid, meteor or meteorite?

Which is which and what is a comet?

**Meteoroids** are rocks traveling through space, between the size of a grain of dust and a small asteroid.

**Meteors** are meteoroid that enters a planet's atmosphere and burn up.

**Meteorites** are meteoroids that have hit Earth's surface.

**Asteroids** are rocks orbiting the sun and are between a meteoroid and a planet in size.

**Comets** are objects made of ice and dust, often with a gas halo and tail.



*Iron meteorite from Chaco, Argentina. One of the 'Campo del Cielo' fragments first found in 1576.*



## How it works

When making your craters, you may have noticed that the higher you drop the ball from, the greater its velocity (or speed) at impact. The greater an object's velocity, the larger the impact crater.

If you dropped two objects from the same height, the heavier the object, the larger the crater created. If you dropped two objects from the same height, the bigger the object, the larger the crater created.

Impact craters are formed when an object is traveling extremely fast (thousands of miles per hour) through space. When it crashes into a surface at these speeds, it forms a crater regardless of how hard or tough the surface is. The object immediately vaporises (turns from a solid into a gas) and creates enormous shockwaves through the ground that melt and recrystallize rock. So the crater is formed not only by the impact, but by the damage done by the object vaporising.

## Other things to try

### Drop the same object from different heights

Drop the same object into your bowl or tray from different heights.

What happens to the width of the crater?

What happens to the depth of the crater?

### Create this cool crater



Fill a bowl or tray with a layer of flour, then cover this with a layer of cocoa powder.  
Drop your object into your bowl or tray and watch what happens!

