

About this activity



In this activity you will investigate the size of impact craters made by 'meteorites' dropped from different heights. Just like scientists, you will make careful observations and take precise measurements.

Kit List

- ☑ Baking tray or flat-bottomed container (e.g. shoebox) half filled with flour, or sand.
- ☑ A variety of 'meteorites' to test e.g. marble, rubber ball, stone, ball of plasticine or salt dough.
- ☑ Tube for safely directing dropped/rolled meteorites e.g. inner tube from kitchen roll or wrapping paper.

Items to make crater measuring device:

- ☑ Tape measure (ideally rigid) to identify drop height.
- ☑ Card circle cut from a cereal box.

Time: 1 hour



Important words to understand:



- collision
- crater
- density
- depth
- diameter
- impact
- meteor
- meteorite
- speed
- surface
- trajectory
- variables

Not sure what they mean? You could use a dictionary to check (paper or online).



The Challenge



An impact crater is a bowl-shaped hole left behind on the surface of a planet or moon following a collision with a meteorite.

The Space Agency would like you to find out whether different kinds of meteorite make different kinds of crater by dropping some model meteorites into sand/flour. You can also explore the craters left by meteorites dropped from different heights.

Watch out!



- Ask an adult to help make a cut in the centre of the card circle.
- Place tray/flat container on the floor to allow for safely dropping meteorites from increasing heights.
- Use the kitchen roll or wrapping paper tube to safely direct your meteorites.

OUR METHOD

- Select the items you will use as meteorites. Make sure you have a range of different meteorites with various sizes, weights, and materials – see the **example meteorites** pictured below for some ideas.
- Drop your first meteorite from at least three different heights e.g. 25cm, 50cm and 75cm. Use your crater measuring device to carefully measure the depth of each crater. Level the crater between each drop.
- Repeat the process for your other meteorites ensuring that you drop them from the same heights as your first meteorite.

Example meteorites

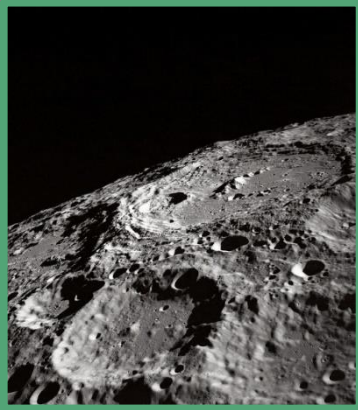


Remember, to make the test fair, you must only change one thing at a time. You could use the results table on the next page to help you keep track of the variables you are changing. You might start, as suggested, by testing each meteorite at different heights before moving on to the next, or you could test all meteorites at the same height before repeating the test for each different height.



How will you investigate... ?

Making your own crater measuring device



Crater measuring device

rigid tape measure

circle of card

1. Push the tape measure through a small cut in centre of the card circle and lightly rest the device on the bottom of the crater.
2. Move the card circle up or down the tape measure and rest it gently on the edge of the crater.
2. Read the tape measure just above where the card is resting and record your measurement.

Recording your Results



Height of drop (cm)	Crater depth (cm)		
	25	50	75
Meteorite 1			
Meteorite 2			
Meteorite 3			

Once you have completed your observations and recorded your results, it is time to advise The Space Agency about the impact craters caused by the different meteorites.



THEY WILL WANT TO KNOW...

- How did you carry out your tests and make them fair?
- How did you test each meteor and each height?
 - What are your results?
- Which meteorite left the largest/smallest crater?
- How reliable was your measuring device?

Write a short report or make a video to share your results with

The Space Agency
Share it with us [@ciecyork](https://twitter.com/ciecyork)

TAKING IT FURTHER

Follow up activities:



- Could you investigate to see what happens when you drop the meteorites from different angles?
- By using a set of scales, you could find items which are different shapes or sizes but have roughly the same mass (weight) and investigate the effect of mass.
- Add a thin layer of chocolate powder to your flour/sand to find out what happens to the surface and the layer below when a meteorite lands.
- Perhaps investigate what happens when you use meteorites which break apart on impact such as those made from damp sand.

Things to think or talk about:



- What is the difference between a meteor and a meteorite?
- Could you try alternative surfaces for your investigation such as flour, cornflour, sand, or salt?
- Is a crater different if the same meteorite lands on wet sand or dry sand?
- Is there a link between the size of a meteorite and how wide and deep the crater is?
- Is there a link between the weight of the meteorite and the diameter and depth of the crater?