

## MAKE AN IMPACT! >>>>>

Rocky planets such as Mars are often littered with craters: holes, usually circular in shape, made when a piece of rock (meteorite) or an ice and rock mixture (comet) from space crashes into the planet. But how big did those meteorites have to be to make such huge impressions on Earth?

Find out with this mock meteorite exercise, learn about the impact of rock size, weight and velocity on a crater.

### EQUIPMENT

- Tray half filled with sand
- A variety of 'meteorites' (e.g. marbles, rubber balls, stones)
- Tube for safely directing dropping/rolling 'meteorites'
- Measuring scales
- Ruler
- Metre stick

### ACTIVITY STEPS

- ① Investigate the effects of dropping various masses, such as marbles, into a tray of sand.
- ② Place the tray on the floor, this allows the height of the drop to be increased safely. Drop the 'meteorite' object from a certain height and measure the size of the crater produced.
- ③ Repeat the experiment, but change some of the key factors. Drop the object from a greater height or make the object bigger. Make the changes one at a time so the comparison is fair; different sizes or mass of object should be dropped from the same height, or the same mass from different heights.

- ④ Record the results and compare them. Discuss in groups how to make the tests fair, how the speed, density and size of the object is important, and how and why this affects the size of the crater produced.
- ⑤ In reality, meteorites would break up into pieces and probably produce secondary craters, but in this experiment the objects dropped remain in the craters they produce.



### SAFETY TIP

Be careful when dropping objects; using a tube through which to drop the objects can direct them safely onto a tray.

### TAKE IT FURTHER

Investigate dropping the masses at different angles rather than straight down or dropping rocks of similar mass but different sizes and shapes. Try making meteorites from a material that will break on impact, such as damp sand.

### DID YOU KNOW?

The Leonid meteor shower happens at intervals of approximately 33 years, though the next one is predicted to occur in 2028 - 26 years after the previous one. It causes meteors to shower the earth at a rate of thousands per minute, and creates the overall effect of lighting up the sky.

*This activity will help you meet the Scout Astronautics Activity Badge requirement:*

1. Show how craters are formed. Use marbles, rubber balls or stones as meteorites and a tray filled with sand as your planet/moon surface.
2. Try the same experiment again but this time make changes to the speed, density and size of the meteorite. How does it affect the crater formed? Test the different effects fairly by keeping one element of your experiment the same, like the amount of sand in the tray.

**SCOUTS** 

© 2015 The Scout Association. Registered charity numbers: 306101 (England and Wales) and SC038437 (Scotland)



# RECORD SHEET

Type of 'Meteorite' (include description of size, shape and weight)	Height	Diameter of crater	Sketch of crater shape
eg rubber ball			

