

ELABORATE

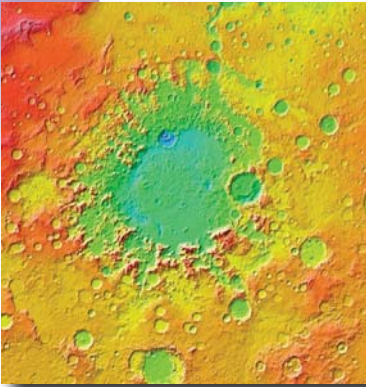
WHAT MADE THAT?! CRATER MAKING

60 MINUTES

SUMMARY

What happens when a space rock hits Earth? Sometimes they make a crater. In this activity, students will drop 'meteorites' onto a soft surface to experiment with making craters.

Students will be running their own experiments and testing different variables but it will be important to start with some free investigation. This will let students experiment with all of the variables randomly, for them to get the idea of the experiment. Afterwards, you can discuss how to make it a fair test? For example, discuss the difference when students drop or throw the meteorite down.



False colour moon crater

OUTCOMES

1. Students respond to and pose questions, make predictions about craters and explore answers by experimenting with materials to make craters
2. Students make informal or formal measurements and sort information
3. Students investigate how force moves or changes the shape of the impacted surface and relate it to changes that occur in our landscape

EQUIPMENT

- Crater making surfaces, in desk trays, such as:

loose earth sawdust flour
sand pit dirt

- Range of 'meteorite' samples, of different weights/sizes such as:

tennis balls marbles ping pong balls dice
bouncy balls sinkers playdough building blocks

- Recording and measuring equipment:

rulers pencils
tape measure camera

- Circle sizes template, page 55
- Results table worksheet (younger students - page 56, older students - page 57)
- Broom, dust pan and brush for smoothing surface and tidying up
- Safety glasses

SAFETY

This experiment requires dropping/throwing objects and loose sand etc. Discuss safety considerations with the students. Safety glasses are recommended and extra adult helpers would be advised.

THE EXPERIMENT

Plan:

A student will drop a 'meteorite' onto the surface in order for the group to find out what kind of crater it makes. What are the things that can be changed?

Choose what things you will keep the same, and what you will change. e.g. Keep the surface (sand pit), height of hand (50 cm), the same and test all of the different meteors.

This is very important in science experiments and makes it a fair test. Discuss what's fair when running a race, or doing a maths test. Things that can change in an experiment are called variables. Things that are kept the same are constant variables.

Predict:

Each student predicts how big (diameter) the crater will be, using 'greater than, less than' terminology

Test:

Student drops each meteorite in a fresh patch of the sand pit/other surface

Analyse:

Students measure the impacts, comparing them to the meteorite that made them, and other craters. Measuring can be with formal (metric) units or informal units (finger depth, counting blocks, which number circle?). Take some photos to record the data. Were the predictions correct?

Communicate:

Students share their findings with other groups and draw pictures of their craters.

As a class, graph the results: what size crater comes from different objects? You could repeat the experiment with different variables, for example, changing the surface and compare the findings across experiments.



Craters in flour

SUGGESTIONS FOR THE CLASSROOM

- Watch the video 'Kandimalal - Aboriginal and Scientific views on Wolfe Creek Crater on the Fireballs in the Sky website
- Use Google Earth, Google Moon and Google Mars to observe craters visible from space. How are they similar and different to the ones you have made?
- Discuss how the angle of approach changes the crater. Can an object coming from space hit at any angle?
- Using a hand sifter, spread a thin layer of cocoa over the flour. This will make the impact craters more visible.
- At the impact calculator online you can choose the size, angle, velocity and density of your meteorite to see what kind of crater it will make:

http://education.down2earth.eu/impact_calculator