5. Investigating Powdery Surfaces

1 hour

Children carry out and evaluate practical tasks to mimic crater formation and discover how meteors expose deeper layers of soil and rock on a planet's surface making it easier for scientists to collect samples.

OBJECTIVES

- Identifying scientific evidence that has been used to support or refute ideas or arguments
- To know that science is about thinking creatively to try to explain how living and non-living things work, and to establish links between causes and effects.
- To know that comparing Mars' key landscape features with similar features on Earth can help us to understand their formation.

RESOURCES

(Per group of 4 children unless otherwise stated)

- As in Activity 3 plus:
- A tray ½ filled with layers of sand, flour and thin top layer of chocolate
- Powder (to represent layers of Martian 'soil')
- Basalt rock samples (optional)
- 4 pairs of safety glasses

INTRODUCTION

In order to simulate what may happen to the surface and underlying layers of Mars when a meteorite impacts, a second tray can be prepared to represent the Martian surface. The teacher points out that the cocoa/chocolate powder could be the iron oxide (rust) covering and the layer below represent the rocks of Mars, then explains what types they might be, e.g. Basalt (rocks from volcanoes). If rock samples are available in school, they could be shown to the children.

ACTIVITY

The children choose suitable 'meteorites' and drop them on to the surface. After one or two drops, the children are encouraged to look at the pattern produced e.g. ejecta blanket (ejected matter that surrounds a crater) of white flour, and may notice that the material which was once low down is now on top. Explain that this can help scientists, allowing them access to look at the rocks under the surface of Mars.
The children continue to investigate dropping meteorites of various sizes and from different heights. They can smooth the surface and add a fresh layer of flour and chocolate powder when necessary.

PLENARY

The children look again at the images and compare the patterns produced by their investigations with those on the images from Mars. Can they find similarities? What conclusions can they make?

SAFETY NOTES, PRACTICAL TIPS AND GUIDANCE

Since there is a danger of fine particles being dispersed into the air, it is advised that the children wear safety glasses during this investigation to prevent fine powder entering the eyes and care should be taken to prevent powder inhalation.

Landscape

Images can be downloaded from www.cciproject.org/topicbank/space.htm

Image K

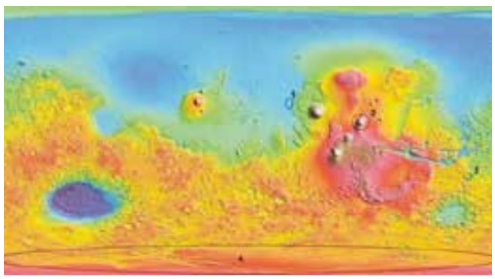


Image of Mars with landscape features for pupils

Image Q

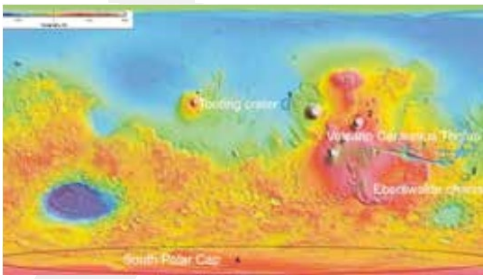
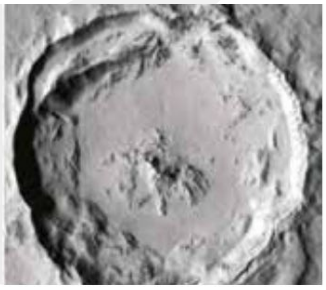


Image of Mars with landscape features marked and named for teachers pupils

Image L

Tooting Crater

Image M

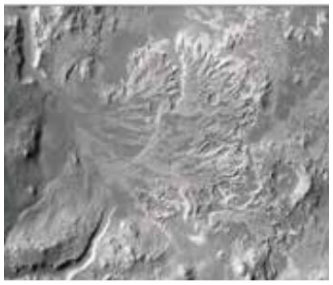


Tooting Crater close up

Image N

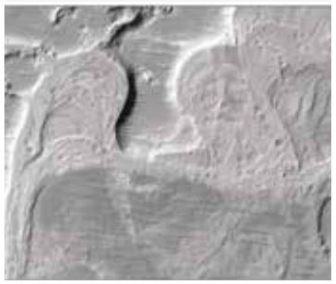
Volcano Ceraunius Tholus

Image O



Eberswalde Channels

Image P



Eberswalde Channels close up

Image R

Crater on Earth viewed from space

Image S

Volcano on Earth

Image T

Water channels on Earth

Image U

River delta on Earth viewed from space