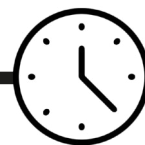


8. Investigating Water Channels



1 hour

Children carry out and evaluate practical tasks to mimic the creation of channels and deltas.

OBJECTIVES

- To think about what might happen or try things out when deciding what to do, what kind of evidence to collect and what equipment and materials to use
- To know that it is important to test ideas using evidence from observation and measurement
- To know that flowing water can wash away or make patterns in a surface body text

RESOURCES

(Per group of 4 children unless otherwise stated)

- Activity sheet 11
- [Images](#) O-P, T-U
- Trough (wallpaper or planting) or deep tray
- 3cm layer of sand/gravel mixed, covering $\frac{3}{4}$ of tray's length
- $\frac{1}{2}$ cup of fine grit
- $\frac{1}{2}$ cup small stones
- $\frac{1}{2}$ cup larger stones
- Jug
- Filter funnel
- Bucket

ADVANCED PREPARATION

- Drill a drainage hole at one end of the tray or trough
- Activity sheet 11 made in to cards

INTRODUCTION

The teacher asks the children to look carefully at the two images O-P, showing some interesting patterns on the surface of Mars, and explains that scientists believe that they could possibly have been made by water flowing across and washing away its surface a long time ago. Their task is to carry out investigations to discover whether water can change a surface such as sand. Their measurements and other observations could help scientists to understand more about the fascinating landscape of Mars.

ACTIVITY

The children prepare their trough with sand, grit and gravel, to a depth of 2-3cm. They smooth the surface of the sand and press out a short channel at one end. Pouring water through a funnel directs the water flow to the channel. The pupil cards (Activity sheet 11) provide challenges, hints and facts to support the activity.

The children are encouraged to:

- make predictions about the effects of altering the angle of the trough
- change the volume or speed of the water they pour
- make careful observations and measurements of shapes and patterns formed on the surface or channels carved into the sand
- test whether water flows faster on the inside or outside of a bend
- discover how obstacles such as pebbles placed along the channel might produce
- a delta
- put tiny particles, such as grit, at the head of their 'stream' measuring how far and how quickly they are carried
- investigate adding a mixture of different sized particles

Images T-U showing channels from Earth or deltas, such as the Nile delta could be compared to the patterns they have made. They should discover that tiny particles are carried further along their 'stream' than larger particles. This would represent sediment in a natural situation.

The children can record their observations in a variety of ways, including video, photographs or drawings

PLENARY

When discussing their observations, the children should look again at the image of channels on Mars and draw conclusions based on patterns they noted. They read the information about Eberswalde provided by the experts (Activity sheet 12), and consider the following:

- *Do their ideas match those of the experts?*
- *How do they think the channels were made?*
- *Do they think water once flowed on Mars?*

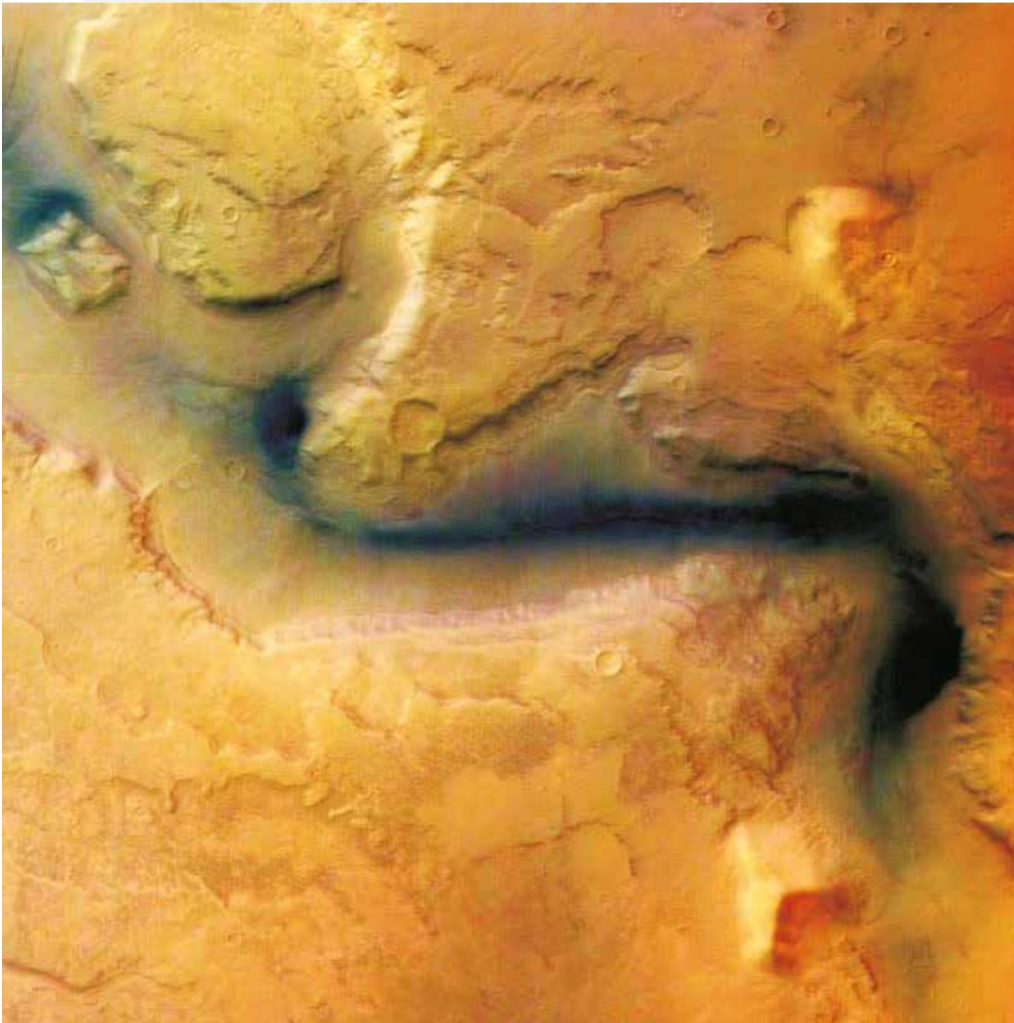
The children could prepare a report for the UK Space Agency. The children should be encouraged to include any measurements or other evidence to support conclusions. Communications managers from each group could act as 'envoys' (Appendix 2), moving on to a new group in order to summarise and explain their group's ideas to others.

SAFETY NOTES, PRACTICAL TIPS AND GUIDANCE

Teachers should ensure that excess water is drained or scooped out of the trough and into a bucket. A fresh layer of sand and gravel may be added each time if required. The children will soon discover that the sand is washed along the trough if they pour too much water too quickly or if the trough is supported at too steep an angle. If a small volume of water is poured slowly then the pattern of flow can be seen. The best results are obtained by positioning the tray at a very slight inclination.

BACKGROUND INFORMATION

Water makes distinct patterns when it erodes a landscape and deposits sediment. Most river beds have a very slight incline, less than 5 degrees. Gently flowing rivers carry sediment and distribute the particles. Small, light particles are carried further and more easily than large heavy ones. Martian images seem to support the hypothesis that water once flowed on its surface. Mars would have to have had a different climate in the past, warmer with greater pressure, to have allowed water to flow.



European Space Agency image showing possible evidence of erosion by water

Landscape

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

Image K

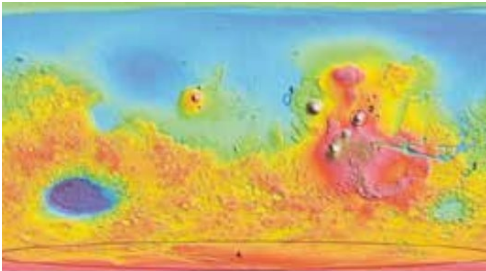


Image of Mars with landscape features for pupils

Image Q

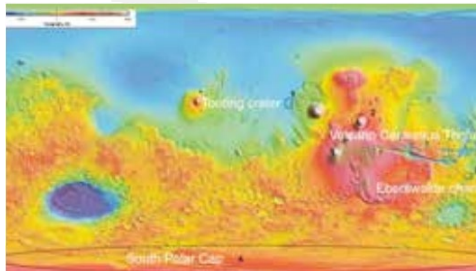


Image of Mars with landscape features marked and named for teachers pupils

Image L



Tooting Crater

Image M



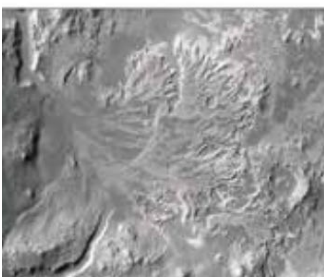
Tooting Crater close up

Image N



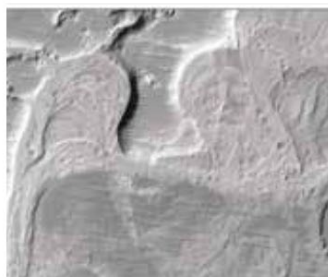
Volcano Ceraunius Tholus

Image O



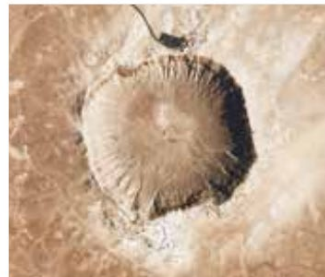
Eberswalde Channels

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



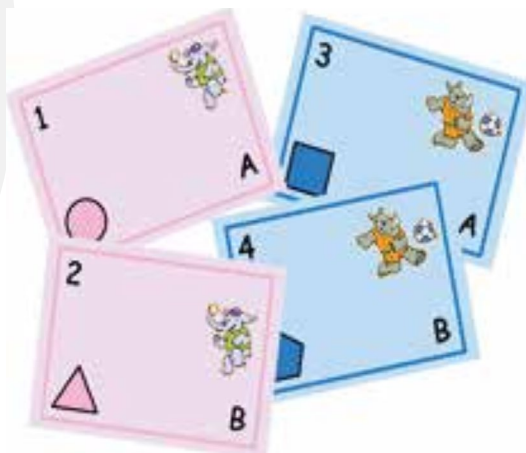
River delta on Earth viewed from space

Appendix 2: DIPS STRATEGIES

DISCUSSION STRATEGIES

The following strategies are used extensively as part of the Discussions in Primary Science (DiPS)¹ project, and have been proven to be successful when developing children's independent thinking and discussion skills.

Use of these strategies is strongly recommended during the activities on this website. Icons shown here with a description of each strategy are provided on each activity's web page, suggesting the type of discussions best suited to each activity.



TALK CARDS

Talk cards support the teacher in facilitating these discussions, with the letters, numbers, pictures and shapes enabling the teacher to group children in a variety of ways.

The example provided here shows one set for use with four children. The set is copied onto a different colour of card and talk groups are formed by children joining with others who have the same coloured card.

Children can then pair up by finding a partner with the same animal or a different letter eg. elephant, rhino or a + b pair. Each TALK pair would then have a card with a different number or shape.

The numbers or shapes may then similarly be used to form alternative groupings and pairings.

Note: The example talk cards are provided in MS Word format so you may make changes if you wish.

ITT (INDIVIDUAL THINK TIME)



Each child is given time to think about the task individually before moving into paired or group work.

TALK PARTNERS



Each child has a partner with whom she/he can share ideas and express opinions or plan. This increases confidence and is particularly useful where children have had little experience of talk in groups.

A > B TALK



Children take turns to speak in their pair in a more structured way, e.g. A speaks while B listens B then responds. B then speaks to A while A listens and then A responds to B.

¹ For more information go to www.azteachscience.co.uk

SNOWBALLING



Pupils first talk in pairs to develop initial ideas. Pairs double up to fours to build on ideas. Fours double up to tell another group about their group's ideas.

ENVOYING



Once the group have completed the task, individuals from each group are elected as 'envoys', moving on to a new group in order to summarise and explain their group's ideas.

JIGSAWING



Assign different numbers, signs or symbols to each child in a group. Reform groups with similar signs, symbols or numbers, e.g. all reds, all 3s, all rabbits and so on. Assign each group with a different task or investigation. Reassemble (jigsaw) the original groups so that each one contains someone who has knowledge from one of the tasks. Discuss to share and collate outcomes.