



How were the Martian canals formed?

Journey to Mars

time

45 & 30 minutes, spread over 2 days

learning outcomes

- To:
- know that a canal can be formed by water
 - see that canals formed by water are more rounded than canals dug by people or machines

end product

- a piece of Mars with Martian canals

materials needed

- photograph of Martian landscape (Appendix)
- photograph of Mars (Appendix)
- photograph of Martian canals (Appendix)
- 12 materials containers
- 24 small paper plates
- 12 small and 12 larger containers
- 12 plastic spoons
- 12 wooden ice-lolly sticks
- 12 bowls (to catch the water)
- 12 plastic cups
- A4 paper
- plaster of Paris
- embroidery needles
- reddish-brown paint
- paintbrushes

Preparation

For the activity **What can you see on Mars?** you will need the photographs of the Martian landscape, Mars, and the Martian canals from the Appendix.

For the activity **Make a Martian canal** prepare 12 containers, filling them with the items listed below.

Each should contain some plaster of Paris, a small container of water, an empty container to mix the plaster of Paris in, a plastic cup, a wooden ice-lolly stick, an embroidery needle, sand, two small paper plates and a bowl (to catch the water).

For the activity **What is the difference?** the children will need the photograph of Mars from the Appendix. Make colour photocopies of this for the children.



What can you see on Mars? 15 min.

Give each child a sheet of A4 paper and a pen. Show the children the photographs of the Martian landscape, Mars, and the Martian canals briefly one after the other. Then ask the children to record what they can remember of what they have seen. Encourage them to write and draw pictures. Ask the children if they noticed any canals. Show the photograph of the Martian canals again. Explain to the children that experts think the canals on Mars were formed by liquid water which once flowed across the surface of the planet. The astronomer Giovanni Schiaparelli thought he could see dark, straight lines on Mars. He called these lines 'canali', which was translated as 'canals'. This suggested that the canals were artificial, and that they had been dug by intelligent beings living on Mars. The American

astronomer Percival Lowell in particular was convinced that the Martian canals were dug by Martians. We now know that this is not the case. The canals were probably created by running water.



The children investigate how the canals on Mars may have come into being.



Make a Martian canal 30 min.

The children work in pairs. Give each pair a container.

Explain that they will be working with plaster of Paris and that this hardens very quickly. It is difficult to remove from your clothes etc once it is dry, so the children will need to work very carefully. The children follow the instructions in [Task 1](#) on the worksheet. Make sure they wait around 20 minutes for the plaster to set before they use water or a spoon to make canals in their Martian landscape. This task is intended to investigate whether naturally formed canals look different from canals made by people. Assist the children where necessary with mixing the plaster and making the canals. When all the children have finished make sure their names are on their landscapes and put them in a safe place. Leave the plaster to dry for one day.

Good to know.

The Martian landscape is not really made of plaster, but you can use plaster to show the difference between natural and artificially formed canals.



What is the difference? 15 min.

The next day the children examine the two sorts of landscapes.

They look at the difference between the canals made by a spoon and the canals made by running water. The children complete [Task 2](#) on the worksheet.

Distribute the coloured photocopies of Mars and encourage the children to use them to paint their own landscape reddish-brown.



What the scientists think 15 min.

Discuss the worksheet and explain to the children that the scientists looked carefully to see if the canals could have been made artificially. Just like the children, the scientists carried out experiments to investigate this. The experts reached the conclusion that canals made by water have a different shape from canals made artificially.

This is why experts today are convinced that water once flowed through the canals. Show the children the photograph of the Martian landscape again.

Explain that the canals may have been formed by the water washing the soil away, so that a channel is worn away in the ground.



How were the Martian canals formed?

1 *Make a Martian canal*



Your teacher will give you a container with the items you need for this experiment.

Read the instructions carefully before you begin. The plaster sets very quickly.

What do you need to do?

1 Take the plastic cup. Prick a hole in the bottom of the cup using the embroidery needle. Take care: don't hold your hand under the cup while you do this.

2 Put two spoonfuls of plaster powder in the empty container.

3 Now carefully pour on some water (not too much!).

Use the spoon to stir the mixture until it starts to thicken.

4 Spread the plaster mixture onto two paper plates. Smooth the surface of the plaster using the back of the spoon. Wait 20 minutes.

5 Now the plaster should feel like clay. Be sure you make both plates at the same time. For the next step you should each choose one plate. This is so you can work more quickly.

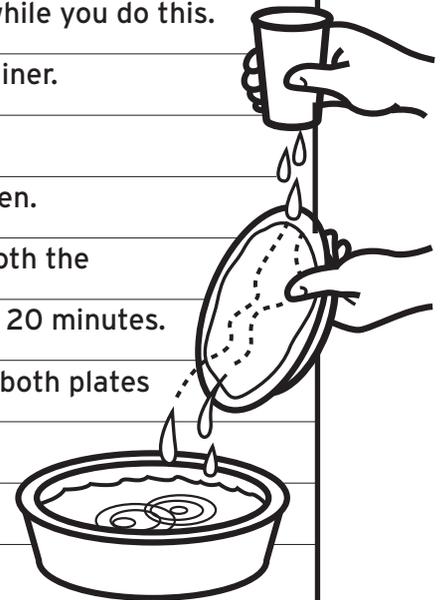
6 Plate 1: Use a wooden ice-lolly stick to scratch some lines into the plaster on Plate 1. These are your artificial canals.

7 Plate 2: Hold plate 2 at an angle over the large drip bowl.

Make sure the plaster doesn't run off the plate.

8 Take the plastic cup with a hole in the bottom. Cover the hole with your finger. Ask your partner to pour some water in the cup.

9 Take your finger off the hole and drip some water onto the plaster, starting at the top of the plate. Be sure to drip the water onto the same place for a little while before doing the same in another place. You will see canals being formed by the water. When you have made some canals you can put the cup down.



Use the large drip bowl to catch the water as it runs off your plate.

Put down the plate when you are finished.

10 Leave the plaster plates to dry.

2 What's the difference?



You have now made two plaster landscapes. When they are dry examine both landscapes closely.

a What differences can you see?

b What do you think made these differences?

c Researchers have studied the surface of Mars.

They carried out similar experiments to the one you just did with the plaster.

Do you think that the canals on Mars were made by people, like the astronomer Percival Lowell thought?

yes / no, because

 **CIRCLE** the correct answer and write the explanation

d Have you finished the tasks? Paint your landscape reddish brown like the surface of Mars in the photograph. Does it look the same?

