



# MARS

## 1. Mars – so similar to Earth, yet so different

Mars is like Earth in some ways. Mars is also a rocky planet, but smaller than Earth. Mars has seasons, just as Earth does. Mars has ice at its poles – like Earth does. Mars takes just over 24 hours to spin on its axis, which means its day is about the same length as a day on Earth. There is also an atmosphere on Mars. But the atmosphere on Mars consists mostly of carbon dioxide gas. Mars is much colder than Earth, because it is further from the Sun. During the day the temperature on Mars hardly rises above freezing. And at night the temperature on Mars can drop to  $-200^{\circ}\text{C}$ .



## 2. The moons of Mars

Mars has two small moons called Deimos and Phobos. The two moons orbit around Mars. They are such small moons that they don't have enough gravity to pull themselves into a tight ball shape.



**Deimos and Phobos.**  
These two moons of Mars are a little bigger than the size of Table Mountain.

## COOL FACTS

How far from the Sun? 228 million kilometres  
 Size (diameter)? 6 787 kilometres  
 How fast does it travel? 24 kilometres per second  
 How long is the day and night? 24 hours and 37 seconds  
 How long is the year? 1.9 Earth years  
 How many moons? Two – Phobos and Deimos  
 Average temperature at the surface?  $-23^{\circ}\text{C}$



Where is Mars in our Solar System?

Mars is Earth's closest neighbour. Mars is easy to see by its red or orange colour.

# OUR RED COUSIN

## 3. Exploring Mars

Mars is often in the news because scientists and astronomers are making new discoveries all the time. When we study the pictures taken of Mars we can see things that look like dry riverbeds and ice caps at the poles. Was there ever water on the surface of Mars? On Earth, almost everywhere that we find water, we also find life.

This has made people wonder whether there was life on Mars long ago. We also wonder if there is life on Mars now, and whether there could be life on Mars in the future.



**The Mars Rover**  
Humans have not walked on Mars yet. However little robots with cameras have landed there and taken wonderful clear photographs.

## 4. Scientists have planned many explorations of Mars for the future

NASA's exploration of Mars has the following four goals:

1. To find out whether life ever existed on Mars.

NASA scientists will look for:

- Water
- Places where living things might use heat energy from underground
- Signs of carbon, which is an element needed for life, as we know it.

2. To learn about the climate on Mars.

Scientists will study:

- The weather on Mars
- The melting and freezing of the polar ice caps
- The many dust storms on Mars.

3. To learn about the geology (rocks) on Mars.

Geologists will study:

- The rocks of Mars
- Volcanoes on Mars, like 'Olympus Mons', the largest volcano in the whole Solar System!
- Craters, valleys, ridges, cracks, crannies, and other land formations to try to work out how they were formed.

4. To prepare for humans to go to Mars.

- NASA will develop ways to help humans to survive on Mars.

Source: [www.nasa.gov](http://www.nasa.gov)

(NASA stands for: National Aeronautics and Space Administration in the USA)



The planet Mars



## ACTIVITY 1. Looking at Mars

Learning area: Natural Sciences and Languages

Interpret pictures and talk and write about them

- Imagine that you are a NASA scientist and you have received the photos taken of Mars.
  - Describe what you see.
  - What do you think could have made these features in the landscape?
  - Can you think of a way to prove your ideas?
- Share your answers with a partner. Were any of your answers similar?
- Together decide whether you think people could live on Mars or not. Give reasons for your answers.



Rocks and hills on Mars.

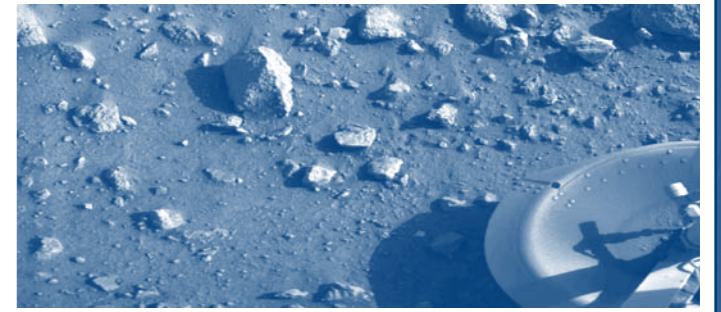
## ACTIVITY 3. Exploring Mars

Learning area: Technology

Design a vehicle to explore Mars

- Read about exploring Mars.

Scientists have sent spacecraft to explore Mars. Two identical 'rovers' (robot vehicles) called Spirit and Opportunity were sent to Mars. The rovers are space vehicles specially designed to move around over rocks and sand on the surface of Mars. The rovers were sent to Mars in a spacecraft that went into orbit around Mars. Each rover was carefully dropped onto the surface of Mars, protected inside a balloon. The rovers were sent to explore two different places on Mars. They were instructed to move around over the surface and take rock samples and photographs on Mars. The photographs are sent back by computer to scientists on Earth who are studying Mars. Now we have many pictures of what Mars looks like. Scientists have to use vehicles like the rovers to explore Mars. It is too dangerous to send people to Mars to explore it. This is because there is no air or water on Mars as far as we know, and it is also very far away.



A picture of the surface of Mars taken from the 'Spirit'.

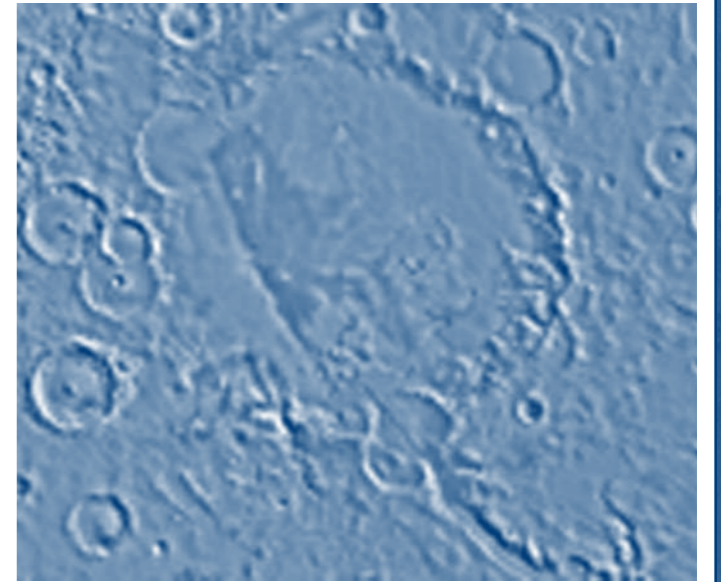
- Design a vehicle for exploring Mars.

**Brief:** Design your own rover for exploring Mars

**Specifications**

The rover must:

- Have enough power to move for at least a month.
  - Be steered by scientists using computers on Earth.
  - Be able to move forwards and backwards.
  - Move over small rocks.
  - Take photographs and videos.
  - Pick up rock samples to photograph.
  - Be able to recognise water if it finds water.
- Draw your design.
  - Label all the parts.
  - Write a few sentences about each part to explain how it works and why you have included it in your design.
- Display your design and explain it to the class.
  - Discuss with your group how you can improve your design.



The Gusev Crater.

## ACTIVITY 2. Mars and Earth

Learning area: Natural Sciences

- Read the information in the table about Earth and Mars

| Features                | Earth   | Mars  |
|-------------------------|---|---|
| Size (diameter)         | 12 750 kilometres   | 6 787 kilometres                                  |
| Atmosphere              | Consists of a mixture of gases (Nitrogen, Oxygen and a small amount of Carbon Dioxide (CO <sub>2</sub> )) | Consists of Carbon Dioxide (CO <sub>2</sub> ) gas |
| Presence of water       | Has water   | Has no water                                      |
| Seasons                 | Has seasons   | Has seasons                                       |
| Length of day and night | About 24 hours  | About 24 hours                                    |
| Temperature (average)   | 15°C  | -23°C   |
| Number of moons         | One moon  | Two moons (Phobos and Deimos)                     |

- Compare Mars with Earth.

- Write a paragraph that begins: Mars is similar to Earth because ...
- Write a second paragraph that begins: Mars is different from Earth because ...

## ACTIVITY 4. The Martians have landed!

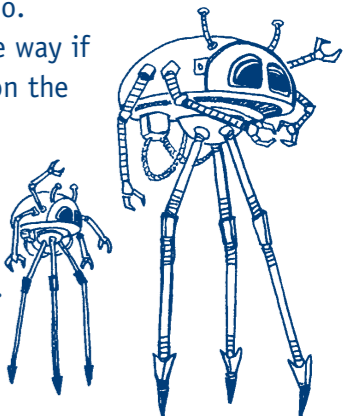
Learning areas: Arts and Culture and Languages

Write a play and draw a picture

*The Martians landed*

In 1938 a famous writer Orson Welles, wrote a play for radio, based on a book called the 'The War of the Worlds' by H.G. Wells. In this play on the radio, Martians (creatures from Mars) attacked Earth and landed in the USA. The listeners thought the play was a real news flash. They believed that creatures from Mars had really invaded the USA. All over the country, people panicked and they rushed to defend their homes and families from the 'invasion'. This just shows how easy it was, then, to persuade people that there really was life on Mars.

- Read the paragraph about the play for radio.
- Do you think people would act in the same way if they heard a modern version of that play on the radio today? Discuss what you think with your partner.
- Write a paragraph that describes the plot (story) of a play or movie with creatures (aliens) from Mars arriving in South Africa.
- Draw what you think the aliens would be like. (Remember that they have to survive on Mars.)



People made drawings of what they thought Martians could look like.