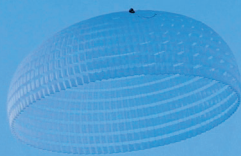


For 5 to 7 year olds

Context

ESA's ExoMars mission is sending a lander, and rover called Rosalind Franklin, to Mars in 2020. The capsule containing the lander and rover will separate from its spacecraft shortly before reaching the Martian atmosphere, and will use two large parachutes, along with other technology, to slow its descent before landing on the Red Planet. In this activity, the children watch a video clip of ExoMars; make parachutes; are introduced to some geographical features of Mars; and use language of direction and position to try to land a toy rover on a Martian surface after identifying suitable landing sites. They may go on to test parachutes of different sizes, designs and materials.



Testing a 35-metre parachute
from the ExoMars missions

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National curriculum links

Science - working scientifically, materials:

- Experience simple practical enquiry
- Compare the suitability of different materials

Maths - shape, space and measure:

- Talk about direction, shape, distance and position

Resources

- | | |
|---|--------------------------|
| • Toy parachute for demo | • Balloons |
| • Tape, cones, hoops, images, 2D shapes, for Mars surface | • Sticky tape |
| • Plastic bags | • Scissors |
| • Paper | • String |
| • Fabric | • Plasticine |
| | • Lego bricks or similar |

Lesson starter

Show the children a large piece of plastic cut from a thin plastic bag and a ball of scrunched up plastic. If they drop them, what will happen? Which do they think will fall faster? Try! Can they explain the difference between the way the two fell? Now, compare the fall of a small toy and a similar toy attached to a parachute. Can they describe what happened? Can they suggest who would use or need a parachute? Scientists are sending a rover called Rosalind on a long journey to Mars: exploration.esa.int/science-e/www/object/index.cfm?fobjectid=58091

The rover will need a parachute to help it land on Mars. This ESA video clip shows how it all happens: www.youtube.com/watch?v=9NpkbExlNiA

Rosalind has to land in a safe place on Mars but there are lots of obstacles. Show the children a few images of key surface features of planet Mars from Activity sheets 1-1b or using this link: mars.nasa.gov/mro/multimedia/images/?ImageID=7731



Main activity

Show the children the area you have set out as the surface of Mars, divided into squares using tape or chalk. (See support notes.) In some squares, add an image of a Mars key feature or object to represent it eg rocks, craters, volcanoes, hills; in other squares, place 2D shapes.

We are going to make some parachutes and see whether we can land a little model Rosalind rover on planet Mars. What might happen to Rosalind if she lands on rocks? Where is a good place to try to land? Mark a few landing areas with rope or paper.

The children use the pieces of plastic and strings to make their own parachutes. See support notes for examples. These links show how to make a simple parachute: www.youtube.com/watch?v=wjhox79tXk4 www.wikihow.com/Make-a-Toy-Parachute

Attach a Lego brick or plasticine as the rover. Throw up the parachute as high as you can and watch it float down. Can you throw the parachute into the air and land the rover on Mars? Where did it land? (hills, volcano, crater, shape). Choose where you want it to land. Where will you need to stand? The children work with a partner and give them directions using the squares as a guide. They could take turns to collect the parachute from its landing place, one giving clear directions for their partner to follow, such as forward two squares, turn right, etc.



Parachute made from plastic food bag, strings and plasticine 'rover'

Further activities

- There are many more opportunities for more parachute fun. Try different sizes, types of materials, toys or strings. Do balloons work? How about two parachutes?
- What happens if we put a hole in the parachute?
- Draw your own Mars map, add some features such as volcanoes and mark where Rosalind should land.

Plenary

The children talk about their parachutes. Which ones worked well? Which travelled fastest, slowest?

The rover Rosalind will have a huge parachute to land on Mars. Why does it need a parachute? What does the parachute do? Explain that the parachute slows the rover as it falls through the air.

What might happen if we make a bigger parachute or a smaller one? What might happen if you use two parachutes or when you attach a balloon? What else can you think of to try?

The scientists would love to hear about your parachute investigations. End the lesson with the children drawing a picture, writing about, or taking photos of their activities, to send to the UK Space Agency.

STEM Vocabulary

Parachute	Slow, fast	Direction
Air	Large, small	Right, left, turn
Fall	Forward	

Images of geographical features on Mars

mars.nasa.gov/mro/multimedia/images/?ImageID=7731

