

These notes accompany the section titled 'And Now for the Weather!' to support teachers in carrying out the three activities. They provide background information, tips for advance preparation, opportunities for cross curricular links and a suggested reading list and useful website links for enrichment.

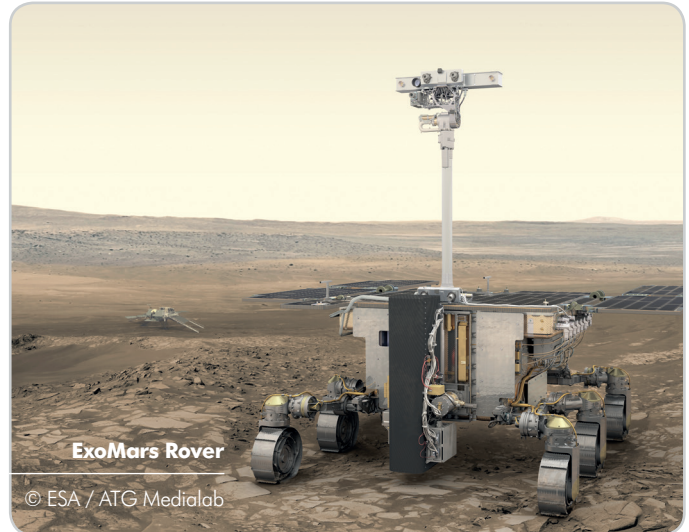
### Background information

Earth orbits the Sun in an almost circular path and is at a relatively constant distance from the Sun. The weather on Mars is much more extreme than on Earth because Mars has a very thin atmosphere, and also when it travels in space it follows a path that takes it very close to the Sun and then very far away. It has huge changes in temperature from day to night. It does not rain and has very few clouds, so although very cold it is sunny, except when it experiences strong winds and huge dust storms. However, there are some similarities between Earth and Mars. For example, both have seasons and polar ice caps. Flyby and orbital spacecraft provide data from above, whilst landers and rovers collect data by sampling on the surface.

The Moon is a natural satellite which orbits Earth but here, there are many kinds of artificial satellites, made and launched into space; they help in navigation, weather forecasting and mapping other planets.

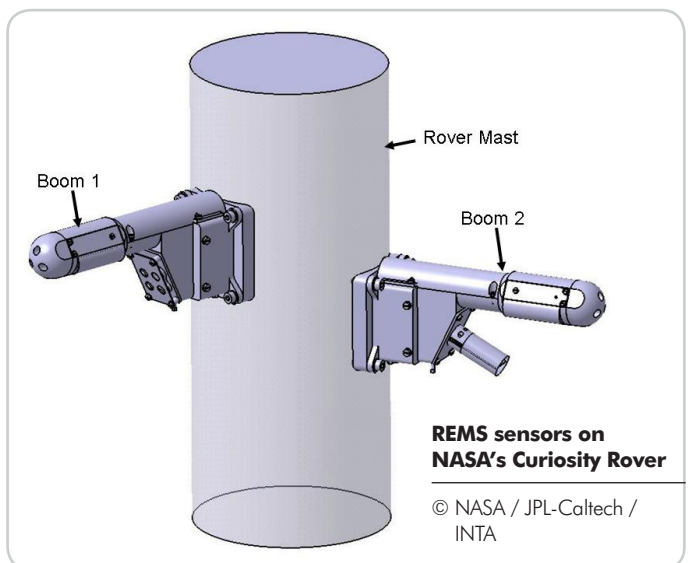
In 2016, the ExoMars orbiter was launched into orbit around Mars. Its job is to measure trace gases in the atmosphere. It will also relay communications from the rover and lander due to launch in 2020. The ExoMars mission 2020 has two science elements. The rover will investigate the local geology and search for signs of past and present life, while a surface platform or 'lander' will study the Martian environment. The lander will have a suite of instruments designed to monitor the climate and atmospheric conditions; it will investigate the amount of water vapour in the atmosphere, daily and seasonal variations in ground and air temperatures, and the levels of UV radiation. Four European instruments will monitor pressure and humidity, UV radiation and dust, and the local magnetic field. *The activities in this section are based upon this element of the mission.*

Much climate data has already been sent and continues to be collected by NASA's Curiosity rover, which landed on Mars in 2012. Its rover environmental monitoring station (REMS) provides measurements of temperature, humidity, pressure, dust storms and levels of solar radiation.



### Activities

Children in EYFS will think about different kinds of weather and will learn that Mars can be very windy. Using the story 'The Wind Blew' by Pat Hutchens, as a stimulus, the children investigate materials that will blow in the wind; they use their imagination to make and decorate wind testers. A poem is the starting point for KS1 investigations using home-made anemometers to measure wind speed, whilst KS2 children use thermometers to measure the temperature of ice and water, use real data to compare and contrast the climate of Earth and Mars, and research and prepare a weather report.



### Activity for 4 to 5 year olds

#### Advanced preparation

Prepare a blank weather chart for recording the weather. Print out suitable weather symbols or use those on Activity sheet 1.

Have available a collection of streamers, coloured papers, card, ribbons and other materials for the practical activity.

To play the weather game in Cross curricular links below, you will need two large plastic or rubber dice. Stick a weather symbol on each face of the first dice and stick movement words, eg skip, on each face of the second dice (Activity sheet 1a).

#### Cross curricular links

##### Communication and language:

- Describing their wind testers, talking to others during practical activity; creating a class shape poem; making a list of windy weather words.

##### Expressive art and design:

- Using imagination and creativity when designing and making the wind tester.

##### Physical development:

- Testing the wind devices provides opportunity for physical activity. In addition, the further activities promote physical development. Play a weather-related game. Place large weather symbols around the room. Use two large dice, one with weather symbols, the other with types of movement. Roll or throw the dice and the children move accordingly eg skip towards the Sun, hop towards rain, twirl towards the wind, float towards clouds etc.

### Activity for 5 to 7 year olds

#### Advanced preparation

Make a simple wind speed tester for demonstration.

1. Cut two strips of cardboard approximately 4cm wide and 23cm long.
2. Staple together to make a cross.
3. Staple a disposable cup to each end, ensuring that the cups all face in the same direction.

4. Press a pin through the centre of the card cross into the eraser of a pencil.

5. Make sure the cups rotate when blown.

Source a telescope or image to show to the children. Some telescopes are based on Earth, whilst others called space telescopes such as the Hubble space telescope are in orbit around Earth or other planets.

[www.nasa.gov/mission\\_pages/hubble/main/index.html](http://www.nasa.gov/mission_pages/hubble/main/index.html)  
[www.nasa.gov/mission\\_pages/hubble/story/index.html](http://www.nasa.gov/mission_pages/hubble/story/index.html)



#### Cross curricular links

##### English:

- Discussing activities, writing reports, explaining results

##### Maths:

- Counting when calculating wind speed; measuring when making wind testing devices

##### Computing:

- Researching information about Mars and its weather

##### Design and technology:

- Making and evaluating

### Activity for 7 to 11 year olds

#### Advanced preparation

Prepare photocopies of a weather forecast from the local newspaper, or upload the BBC weather [www.bbc.com/weather](http://www.bbc.com/weather) or Met Office weather [www.metoffice.gov.uk](http://www.metoffice.gov.uk) on the whiteboard.

Familiarise yourself with the MARCI website: [www.msss.com/msss\\_images/latest\\_weather.html](http://www.msss.com/msss_images/latest_weather.html)

Check NASA's latest REMS' Martian weather report. Scroll down to the bottom of the web page for the overview of temperature, conditions and UV levels.

Why not set up a mock TV studio with maps of Mars and the UK as a backdrop, plus a table with a microphone, for the children's weather reports?

#### Activity

Remember! Keep the thermometer in the water or ice whilst reading the temperature. Allow time for the level of liquid in the thermometer to stop moving, and ensure your eye is level with the top of the liquid before making a reading.

The charts that show extremes of temperatures in the UK and on Mars can be used to stimulate lots of questions and maths activities. The children might like to think of their own questions too.

#### Cross curricular links

##### English - writing, speaking:

- Preparing a weather report
- Delivering a TV style weather report for Mars and Earth

##### Computing:

- Researching weather conditions on Mars and Earth

##### Maths - number, measure:

- Calculating differences between temperatures
- Using scales and reading temperatures accurately

#### STEM clubs

Preparing a weather station and taking weekly readings would be a suitable activity for a STEM club.

#### Books

Mostly related to windy weather!



#### Useful links

[www.esa.int/kids/en/learn/Life\\_in\\_Space/Exploration/ExoMars](http://www.esa.int/kids/en/learn/Life_in_Space/Exploration/ExoMars)

[exploration.esa.int/mars/45084-exomars-rover](http://exploration.esa.int/mars/45084-exomars-rover)

[www.nasa.gov/mission\\_pages/msl/index.html](http://www.nasa.gov/mission_pages/msl/index.html)

[www.nasa.gov/mission\\_pages/msl/videos/index.html](http://www.nasa.gov/mission_pages/msl/videos/index.html)