Overview
Exploring and understanding Mars has become one of the key challenges in space exploration. From remote sensing to landing rovers, our Museum scientists are actively involved in learning more about the red planet. But how do we study a planet that is millions of miles away?

In this workshop, pupils will work in small teams to design and build a LEGO® Martian rover. They will then code, test and evaluate their designs. After receiving missions from our scientists, they will have to decide what their rover should investigate and build appropriate tools for the challenge. In a final challenge, pupils will see how their rovers perform on a large-scale realistic Martian surface.

The workshop has been created in partnership with the LEGO Group and LEGO Education Partner, Raising Robots.

This workshop is divided into four sections:

1) Section one (20 mins): pupils will discover the importance of space exploration and previous missions to Mars. They will learn how our Museum scientists are actively involved in space exploration and why using models such as LEGO is important for engineers.

2) Section two (30 mins): pupils follow a basic prototype to build a rover, which they will then learn to code using LEGO WeDo 2.0 robotic sets. They will have the opportunity to test their rover on different surfaces and make improvements to their design.

3) Section three (30 mins): pupils regroup to receive additional challenges via video from our space scientists, who outline their current fields of study and what they would want to find out about Mars. Pupils will then decide on the aims for their own rover and will build, to a given specification, appropriate tools for the challenge. (The challenges can be differentiated in difficulty for different groups.)

4) Section four (20 mins): in an exciting finale, pupils will see how their rovers perform on a large-scale realistic Martian surface. They will be encouraged to reflect and report on their own achievements and evaluate other teams’ designs.
Learning Outcomes

Students will:

• Gain an appreciation of the previous missions to Mars and the challenges and importance of exploring planets.
• Develop skills in design and technology (in particular designing pulleys, motors and gears) by making their LEGO rover.
• Develop skills in coding by making programs that accomplish specific goals.
• Develop skills in presenting and evaluating their own work as well as their peers by presenting their findings.
• Increase their excitement and positive perceptions of science by taking part in this fun, creative workshop.

Curriculum Links

The activity content falls within the following statements, but does not necessarily support the breadth of content to which the statement refers.

Science

Working scientifically (Upper KS2)

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

• planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
• reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations

Earth and Space – Year 5

• Describe the movement of the Earth, and other planets, relative to the Sun the solar system
• Describe the Sun, Earth and Moon as approximately spherical bodies

Forces

• Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
Design and technology

Design
- Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces, and computer-aided design.

Evaluate
- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.

Technical knowledge
- Apply their understanding of how to strengthen, stiffen, and reinforce more complex structures.
- Understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers, and linkages).
- Apply their understanding of computing to program, monitor, and control their products.

Computing
- Design, write, and debug programs that accomplish specific goals, including controlling or simulating physical systems.
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.

Resources
All resources are provided. Please note no food or drink is allowed during the session.
## Your Booking: Essential Information

### Mission to Mars: LEGO® Explorers Workshop - KS2

| **Meeting point** | When you arrive please go to the **School Reception**, Green Zone, Lower Ground Floor, to check in. Your activity meeting point is the **Darwin Centre Learning Space**. Please arrive here **five minutes** before your session is due to start. See the map overleaf for details. |
| **Contact** | **Pre-visit:** If you have any queries regarding your visit contact Schools Booking on +44 (0)20 7942 5555.  
**On the day:** If you think you may arrive late, please call the Learning Engagement Manager on +44 (0)7887 995953. |
| **Preparation** | Please be aware that central London and South Kensington station can be very busy during the week. Additionally, the Museum often has long queues for entry in the morning. If you are travelling from outside central London please ensure you leave plenty of time to get to the Museum before your session start time. Missing the start of your session may lead to your session being cancelled.  
Before your visit be sure to read and understood our payment and cancellation conditions: [www.nhm.ac.uk/school-payment-cancellations](http://www.nhm.ac.uk/school-payment-cancellations)  
For more information on school group visits to the Museum visit: [www.nhm.ac.uk/schools-essential-info](http://www.nhm.ac.uk/schools-essential-info) |
| **Duration** | **1 hour 45 minutes** |
| **Ratios** | For health and safety purposes, please ensure you have the following ratio of adults to children:  
1 adult : 8 students  
35 children maximum |
Activity meeting point for LEGO® Explorers Workshop

Check in point at Schools Reception when you arrive at the Museum.