

ACTIVITY 4.3 MARTIAN MECHANICS

From the Chapter Four of the Mission Mars Diary
marsdiary.org/activities/martian-mechanics

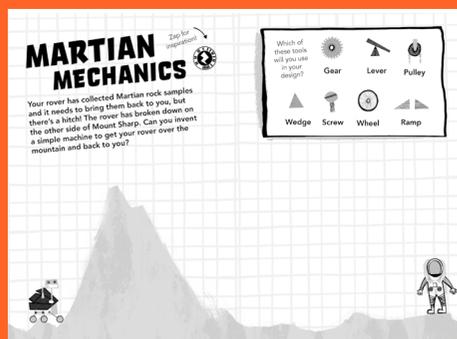
LEARNING LEVEL

KS2, P5-7, Y4-6

CURRICULUM LINKS & DIFFERENTIATION IDEAS

View detailed curriculum links for England, Scotland, Northern Ireland and Wales in the Teacher Toolkit, plus differentiation ideas for your region and year level.

marsdiary.org/resources/#teacher-toolkit



Resources Required

- Smartphone or device for Zap code (optional – see Useful Links)
- Loose parts and materials that would allow the pupils to explore the 'space mechanics toolkit' and how the elements work

Background to this Activity

Although the ExoMars rover will use its built-in instruments to analyse samples, this activity asks students to create a machine to get their rock samples back to an astronaut on Mars. This creative and technical challenge asks students to think about how they would resolve this problem. With inspiration from real-life structural building toys, students will have to construct a machine to bring their rover over a mountain. This is an ideal way to introduce students to forces, structures and machinery.

Running the Activity

Provide resources so that children can explore the 'space mechanics toolkit' prior to designing their machine.

Lower ability pupils may find it more useful to go on a 'mechanics' hunt around school, looking for places where gears, levers, pulleys etc are in everyday use. They can bring this knowledge back to share with their peers in class, collecting evidence using photographs and sketches.

It may be preferable to design a machine in a large group (even as a whole class) initially. Then allow the pupils to redesign it to make it 'better', or lower ability children can copy it and verbally explain to their peers and classroom adults how it would work.

Questions for the Class

- Why is it important to analyse rock samples from different places in Mars?

- Why would you need to bring the rover over the mountain, rather than around it?
- What do you think the rover will be bringing back to you? What might the scientific analysis of the rocks tell you?
- What machines do we use for lifting objects on Earth?

Additional Challenges / Extension Activities

Consider what might happen if Mount Sharp was a different height or shape.

Create a more technical drawing of your machine, fully labelled.

What materials would you make your machine from? Research different materials you would need and why they would be the best.

Ideas for Differentiation

Lower:

- Spend a greater amount of time creating a lifting machine using construction resources and exploring the properties of the different mechanics and materials.

Upper:

- Support pupils to accurately produce a scale drawing or model, using appropriate measurements.
- Encourage exploration of different methods of lifting and which would be most appropriate for Mars.

Useful Links

Zappar Content: Download or view the Zappar content for this activity on its webpage (URL to the left) or access it via the Zap.

ZAP! Students can independently access multimedia

Your Mission **MARS DIARY**

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resources using the Zappar mobile/tablet app. See Zappar instructions at the link below and note that the mobile/tablet will need to be on a WIFI connection:

marsdiary.org/resources/#teacher-toolkit

If you don't have access to the internet in the classroom, all Zap code content is available to download on the activity's web page (see link to the left) as a PowerPoint presentation or as bundles of images.



Find more great space-themed STEM resources at <https://www.stem.org.uk/esero>

