

Power on Mars

Energise Anything!

Did you know?

In the UK, most of our fuel for domestic use comes from natural gas (63%), while a quarter comes from electricity (including renewables, like the ones in our animation). Different appliances use different amounts of power. Old-fashioned light bulbs used a third more energy than the ones we use nowadays.

Science scene-setter

In the UK, we use a lot more energy than people in the developing world. If everyone on Earth lived like we do, we'd need 2.4 planet Earths to provide the energy we need and absorb our carbon emissions. Perhaps it's time to look elsewhere? In fact, The Mars One Project and NASA are both planning to set up a human colony on Mars in the next 10-20 years.

The challenge

Imagine they got there, how could your students power a colony on Mars? Design a power generation solution.

Learning outcomes

- Explore and use science inquiry skills
- Critical analysis of information and data
- Communicate scientific ideas and work in a group setting



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Key activity steps

1 Research



Watch our animation **Generations of power**: eonenergy.com/secondary

- Assume that we've already overcome the technological challenges of getting people there, landing safely and setting up a base. Tell students they are going to design a power generation solution for Mars
- Ask the students to work in groups and list all the activities people would need power for. Can they estimate the amount of energy required for each activity?
- Then list some solutions for how people could generate power on Mars e.g. solar power
- Now assign each group a different power generation solution to investigate further.

2 Design

Tell the students they are going to design a power generation solution for Mars.

- Encourage them to brainstorm by asking them to explore a few different ideas within their solution
- Think about the pros and cons of each one before narrowing it down to one idea
- Discuss the resource requirements and other implications of their idea
- Ask them to research, then draw up a plan of their idea and be able to explain it to others.

3 Test

Help the students design and build a prototype (if possible) of each idea.

- Ask them to present their prototype or plan to the class
- Each group should be ready to give other groups feedback on their ideas
- Discuss whether any of the ideas could be merged to work well with the other groups.

4 Reflect

- What challenges and environmental constraints would the colony face on Mars?
- How could the colony be as efficient as possible? How could you get water? What types of food or transport would be most sustainable?

Equipment and resources

- ✓ Access to internet/library for research
- ✓ Flip chart paper, pens
- ✓ Optional: materials to build their design
- ✓ More information about Mars colonisation:
bbc.com/future/story/20141030-five-steps-to-colonising-mars
sen.com/feature/mars-one-plans-for-human-settlement-on-mars
- ✓ Information about energy requirements:
bbc.co.uk/schools/gcsebitesize/science/add_aqa_pre_2011/foodchains/foodchains4.shtml
scientificamerican.com/article/webber-more-efficient-foods-less-waste/,
en.wikipedia.org/wiki/Energy_efficiency_in_transportation

E.ON's Energise Anything has already engaged over 25,000 young people. We asked some of their teachers to describe it in three words. Here's what they said most often!



Interested in this? They could be...

- An astronaut – travel outside Earth and perform scientific experiments in space
- An astrobiologist – look for the possibility of life beyond the Earth
- An aerospace engineer – develop aircraft and spacecraft
- A renewables engineer – specialise in renewable energies

Visit our careers page to see where a love for STEM could take you: eonenergy.com/stickwithstem