

Engineering Educates

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SEERIH's Engineering Educates equips teachers with hands-on engineering challenges for primary and secondary lessons. Focused on real-world sectors like robotics, the programme blends science, design, and computing, inspiring 7-14-year-olds to think like engineers while linking learning to future careers.



The recent UK STEM skills pipeline report tells the tale of ongoing concerns around the availability of STEM skills in the UK workforce.

49% of engineering and technology business report difficulties with recruitment because of skills shortages (UK Parliament 2025).

This narrative hasn't changed for decades. The increase in vocational routes to improve availability of technical skills, or the introduction of the Modern Industrial Strategy may go some way to chipping into the issue. The Science & Engineering Education Research and Innovation Hub (SEERIH) team are taking a different tack by influencing the influencers. So the teachers of our primary and secondary pupils. We're impacting on young people's awareness of engineering and skills through lessons that are innovatively aligned to the curriculum.

A Launchpad for Future Engineers

Over the years, we have had many opportunities to work with teachers and experts, and it has been inevitable that Design & Technology has naturally emerged as the key route into engineering in schools. It's a win-win, not only does it raise the

profile of the subject itself, but it also helps pupils understand just how vital engineering is to the fast-moving world of technology and industry around them.

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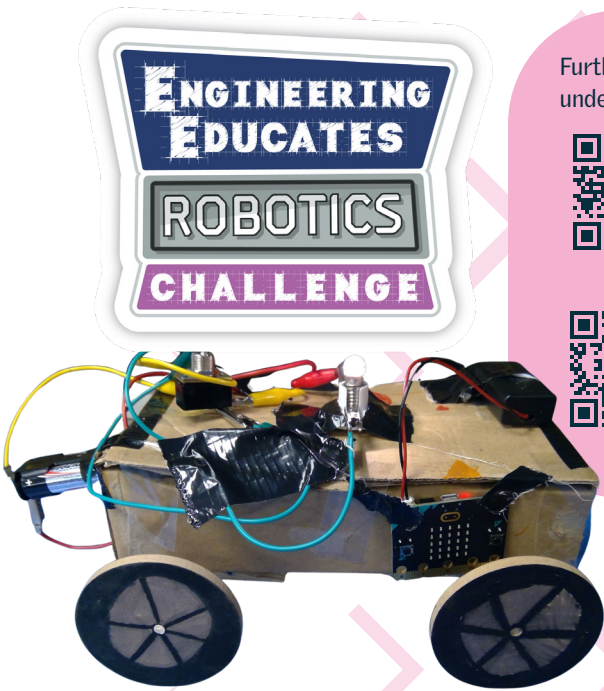
We suspect that it is highly unlikely that the government will introduce Engineering as a subject. Yet we also know that it has relevance and resonance if teachers have support and confidence to embrace making and tinkering using D&T, Science and Computing.

What is Engineering Educates?

First designed in 2017, Engineering Educates has become the trademark of a non-competitive, inclusive, campaign to inspire your 7-14-year-olds to:



Grounded in the research undertaken with the Royal Academy of Engineering (Lucas et al, 2017; Bianchi et al 2021; Bianchi & Wiskow, 2023) SEERIH has moulded the curriculum to embrace a culture of making in the junior and lower secondary age phases.



Further information about the underpinning research:



Engineering Education in Primary Classrooms
tinyurl.com/yh9sbfk3



Progressing to be an Engineer: The Approach Report
tinyurl.com/5aebewe5



Explore Engineering

This time is when young people are forging their identity with STEM yet teachers have few professional learning opportunities in which to explore the potential of engineering as a mechanism to invigorate the curriculum. Since its inception, the campaign has offered a range of contexts, from civil engineering, mechanical, agriculture and now robotics. Each two years the campaign refocuses on new engineering sectors, developing awareness of the multiple disciplines and areas of innovation. In the current campaign robotics is the focus, with 8 Challenges involving:

Teacher notes: direct-to-the-classroom pupil resources aligned to the National Curriculum for England and the Scottish Curriculum for Excellence

The EngEd Toolkit: including templates, prompts and technical guides to support the teaching of designing and making

Careers Chats: profiles of diverse engineers and innovators who are working in industry and academia across the UK Webinars, teacher training events and showcase exhibitions.

Harnessing an Engineering Mindset

'The Secrets Within Challenge' offers an example of how teachers can benefit from the campaign resources.

Context: Pupils are introduced to the pioneering work of the specialist team of engineers from the University of Leeds who collaborated to expose never-seen spaces within the Egyptian temples in the Djedi project.

Task: Pupils design and build their own robots to navigate and collect data from hard-to-reach locations within their own setting. They create prototype ideas that include electrical circuits with bulbs, buzzers, motors and sensors.

Timing: 6 hours across 3 sessions. EngEd Toolkit resources to support: Design Specification and 5D's Decision Maker

In this task, 9-year-olds are asking questions to better understand the problem of discovering hidden spaces. They consider how designing a robot could help to reveal the secrets hidden in hard-to-reach places. They then apply this thinking to relate to an area in their own school before designing a robot that can assist them to reach these difficult, dangerous and dirty places.

Pupils write their own design specifications based on their robot idea and then use sketches to communicate their thinking. By scaffolding this activity, pupils begin to appreciate how the robot is fit-for-purpose and what functions they can incorporate into their design idea.

Pupils from St. Michael's R.C. Primary School in Greater Manchester, designed buggies with light and motion sensors to explore what was above the tiles in

their classroom suspended ceiling. Using micro:bits they were able to mimic how a robot could move into difficult places, just like the robots used by the Leeds University professionals in the Djedi project. The cross curricular nature of this challenge lends itself to pupils using and apply their learning about electrical circuits in Science, coding in Computer Science and making skills from D&T. The context undoubtedly provided opportunity to have a real-world learning context and to find out more about the people and careers related to this area of engineering.

"The pupils really embraced the cross-curricular challenge - from writing a design specification and completing sketches to building the chassis, adding a circuit with switches and bulbs and programming the light sensor in a micro:bit. It's been great to see this approached modelled and something that I'll be able to use year on year."

Year 5 teacher at St. Michael's R.C Primary School.

To find out more about Engineering Educates visit the website Engineering Educates or email: engineeringeducates@manchester.ac.uk



Engineering Educates Robotics Challenge
tinyurl.com/4pnwjj9z