

2019 Ingenious Awardees

National/multicentre

**An Interactive Engineering Exhibition of WES Violets,
Women's Engineering Society**

Amount awarded: £30,000

As part of the centenary celebrations of the Women's Engineering Society (WES) thirty-six engineers will be trained in public engagement and given the opportunity to showcase their areas of engineering. The project will culminate in an exhibition of interactive, creative and inspirational pieces that represent the area of engineering in which the engineers work, while capturing the WES logo, a violet. It will provide members of the public with the opportunity to interact with engineers and broaden their understanding of the engineering industry, and what it means to be an engineer.

BLAST Fest Caribbean Sound SySTEM Project, Manchester, Bristol, Leeds and Birmingham

BLAST Fest UK

Amount awarded: £30,000

The Caribbean Carnival is well known for its bright costumes, banging sound systems and spicy food, however, many people do not appreciate the amount of engineering behind it. The BLAST Fest Caribbean Sound SySTEM Project will bring together engineers, carnival artists, designers and sound system experts to learn, exchange and develop activities to communicate to the public the science, technology, engineering, arts and maths that goes into producing and improving the music and performance at Caribbean cultural festivals.

Space Plague: Immersive Engineering Experience, Bradford and London

SMASHfestUK

Amount awarded: £28,930

SMASHfestUK returns with Space Plague: Immersive Engineering Experience, which will create a touring theatrical experience, giving an unusual insight into the engineering profession. The show will play at two venues and be delivered free of charge. The project will see four daily live performances performed across Bradford and Deptford, as well as workshops relating to the event in three schools in each location.

Scotland

The Ingenious Circus, Glasgow

University of Glasgow

Amount awarded: £29,991

Led by Glasgow Science Festival, the Ingenious Circus, will bring together University of Glasgow and University of Strathclyde engineers, the Aerial Edge Circus School and local primary schools for a truly unique collaboration. The partners will work together to co-develop and deliver an engineering-themed workshop series launching during Glasgow Science Festival and the James Watt bicentenary 2019 celebrations. The project will give engineers a platform to share their passion and expertise in a creative and memorable way.

Robosense: Sensing Your Environment with Robots, Edinburgh

University of Edinburgh

Amount awarded: £28,050

Robosense will give young people from Edinburgh, West Lothian and Fife the chance to learn to program the Limpet robot, a low cost, robust, multisensor robot deploying them around their schools to monitor the environment. Groups of local pupils will be invited to the University of Edinburgh for a day, where they will learn how the robots are designed and fabricated and will make their own robots. They will also visit Heriot-Watt University to work with research level robots.

Young Chemical Ambassadors: Diverse Engineers of the Future, Glasgow

University of Strathclyde

Amount awarded: £22,227

The Young Chemical Ambassadors Programme will train diverse engineers of the future to be ambassadors for chemical engineering. The project will use hands-on engineering outreach to accelerate improvement in the diversity of the future engineering profession, by engaging particularly with schoolchildren from low income backgrounds, females and those with additional support needs. Chemical Engineering researchers will mentor groups of local third year secondary school pupils with in interest in physics and chemistry to undertake mini chemical engineering research projects, before sharing the results with their classmates.

Ingenious on Tour, Scotland-wide

Glasgow Science Centre

Amount awarded: £30,000

Ingenious on Tour brings a Scotland-wide programme of school and community engagement, connecting Glasgow Science Centre's hugely successful On Tour programme with engineers in the energy sector. The programme has recently expanded with the creation of Powering the Future on Tour, a programme of hands-on interactive exhibits, shows and workshops that allow audiences to explore how energy underpins our everyday lives. Ingenious on Tour will develop partnerships with engineers in the energy sector and allow them to engage hard-to-reach audiences, and tour remote and deprived areas of Scotland delivering a programme of schools and community engagement.

Building School Raingardens: Growing future Engineers for Greener Built Environments, Dundee

Abertay University

Amount awarded: £28,984

Sustainable urban drainage systems such as raingardens can bring multiple environmental benefits from mitigating the impacts of climate change and flood prevention to pollution control. The key objective of this project is to raise awareness of the diverse engineering disciplines that come together to deliver these solutions. Working with schools the project will explain the urban water cycle and how raingardens fit into this cycle. Ultimately, it aims to provide a legacy that will promote a generation of future engineers from the schools that can articulate, motivate and demonstrate the need for greener built environments.



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Wales

11 Mile Journey: Discovering North Wales' Amazing Engineering, Denbighshire, Wrexham and Shropshire

Techniquiest Glyndwr

Amount awarded: £17,514

A programme of celebratory events will take place in North Wales to mark the 10 years since the Pontcysyllte Aqueduct and Canal near Llangollen was designated as a UNESCO World Heritage Site. Techniquiest Glyndwr will develop workshops and activities that demonstrate the amazing feat of engineering that makes the 11 miles of canal, including two aqueducts, so special, and engage local communities with the strong engineering heritage of the area. Activities will explore the work of Thomas Telford and his significant contribution to civil engineering, as well as looking at other engineering heritage linked to the World Heritage Site, such as the Ironworks and Collieries.

Empowering Engineers, South Wales

Cardiff University

Amount awarded: £28,660

Cardiff University's School of Engineering will work with the Go Girls Academy and Girlguiding as part of their Empowering Engineers project. Engineers from Cardiff University and their industrial partners will receive public engagement training and will develop several hands-on activities. These activities will be delivered at Go Girl camps and Girlguiding groups and will be turned into online resources for other groups to use. The project will culminate in a two-day camp at Cardiff University.

Photo-Electric Light Orchestra, Bangor, North Wales

Bangor University

Amount awarded: £30,000

Coding and light will be used in this project, teaching school children aged 9-13 in North Wales to engineer musical instruments. The younger audience will develop their instruments implementing coding skills, while the older audience will develop their instruments harnessing the properties of light, using photonics as the source of production. The project will conclude with a musical performance at Pontio Arts and Innovation Centre.

Northern Ireland

Get-Smarter, Belfast

Queen's University of Belfast

Amount awarded: £29,993

Through hands-on workshops based on smart programmable devices the Get-Smarter project will introduce primary school students to the exciting new world of Internet-of-Things and teach them how to use it to solve real-world problems. Each of the activities will be designed and delivered by engineers from industry and the ECIT Global Research Institute at Queen's University Belfast and held at W5 Science and Discovery Centre.

North West

Engineering the Human Body, Manchester

University of Manchester

Amount awarded: £9,027

In this project, school children in the Greater Manchester area in key stage 4 will be challenged to 'think like engineers'. They will be provided with a design challenge where they must apply engineering concepts to choose materials, design surface properties and determine 3D printing manufacturing parameters. The project will particularly encourage underrepresented groups including women, people from Black, Asian and minority ethnic backgrounds, and those from low-income backgrounds to consider a career in engineering.

Engineer! What's Your Story?, Fleetwood, Lancaster and Barrow

Lancaster University

Amount awarded: £8,850

A storyteller will create bespoke local engineering stories from Morecambe Bay to engage pupils with engineering challenges, supported by mentor engineers who will develop their public engagement skills. Together, the primary pupils and engineers will develop their personal engineering story narrative through these engineering-thinking experiences, building resilience, communication and collaborative skills from which they can discover answers to the question, "what is engineering?"

Future Engineers: Raising Aspirations in Partnership with Local Engineers, Oldham

St Bede Primary Academy

Amount awarded: £30,000

There is a wealth of engineering opportunities in Oldham. At any given moment, around 500 engineering vacancies will appear on local job sites within a 20-mile radius of Oldham and industry leaders are struggling to recruit engineers. Yet Oldham struggles with unemployment and social mobility. The Future Engineers project aims to address this gap by providing training with an engineer and exciting classroom activities to all 91 primary schools in Oldham.

Engineering Hack Camp: inspiring the engineers of the future, Wigan

Wigan STEAM CIC

Amount awarded: £30,000

Project partners Wigan STEAM, Edge Hill University, the Foundation for Digital Creativity and MakoCreate will collaborate to equip engineers across the North of England to plan and deliver sustainable engineering workshops to young people. Engineers will be recruited and equipped with the knowledge and skills to run engineering workshops. The engineers will then be paired with partners from a network of regional organisations including schools, colleges and libraries. Engineers and educators will co-design a portfolio of workshops to engage, focused on solving an issue linked to the UN Sustainable Development Goals.



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North East

Tales of Engineering, Newcastle

NUSTEM, Northumbria University

Amount awarded: £17,971

Tales of Engineering will connect professional engineers from academia and industry with young children (age 4-5) and their influencers. Participants will share the experience of reading an engineering-related story book, then jointly undertake an engineering activity, designed by the engineers, using everyday inexpensive materials that will reflect their jobs and the impact of engineering in the world. The project will take place in schools in Newcastle and surrounding areas and in other public venues.

Midlands

STEAM - Bringing engineering to life with the arts, Derby

Déda

Amount awarded: £28,250

This project will work with Key Stage 2 students from three primary schools across Derby. It will aim to give young people from disadvantaged backgrounds an insight into how engineering plays a role in large entertainment events. Students will be invited to an interactive workshop following a performance, where they will see how tricks are performed, what role engineering plays in the process, and have a go themselves. This will be facilitated by engineers, Déda Artists, and teachers, who will run 12 STEAM club sessions in each school.

South West

Bristol Open Doors: Engineering Futures, Bristol

The Architecture Centre

Amount awarded: £23,875

This project will see Bristol's Architecture Centre work with teams from 10 local engineering firms to help each of them produce a built environment themed family event or activity as part of Bristol Open Doors, the South West's biggest festival of architecture and design. The aim of the project is to both upskill engineers and increase engagement with STEM subjects among diverse audiences.

Epic Fail, Bristol

Kid Carpet

Amount awarded: £28,930

Failure can be a hard lesson, but artist Ed Patrick – aka Kid Carpet – along with two engineers and a collection of young people and their families, will be producing a performance lecture to show how failure can have a positive impact on young people's wellbeing. Epic Fail will use the lenses of engineering and art to explore failure as a virtue, using fun, engaging, interactive and participatory methods. Taking up residence in three Bristol schools, the project will work with 8-11 year olds and encourage them to re-imagine their school as a place of exploration where they can make, talk, create, play and test ideas.



South East

Are We There Yet?, London

Children's Radio UK

Amount awarded: £29,810

This project tracks the progress of British roads, from the early muddy roads to the engineered Roman roads that replaced them, connecting towns and aiding security, only to be replaced again by tarmac roads built for cars. Today, our roads are transforming again, with new engineering practices and smart technology making driving faster, greener and easier. Are We There Yet? plays on the age-old phrase used by children, engaging them and their families with how our roads have historically been built, and in the process, young engineers are given the opportunity to improve their public engagement skills.

A million dreams for the world we're gonna make, Portsmouth

University of Portsmouth

Amount awarded: £25,076

This project is focused on the problems associated with water pollution and drainage. Students will be challenged to investigate what happens to the water when it rains on their school and to dream up a solution to any problems they discover in the drainage process. The project will work with six local primary schools in Portsmouth; digital teaching resources and information relating to the project will be made available to any primary school to use after the project. Other local primary schools will also benefit from being able to borrow any physical resources.

Your Town: Transformations by Young People and Engineers, East Sussex

Culture Shift CIC

Amount awarded: £30,000

Following a successful pilot during the Year of Engineering, and backed by Lord Lucas, the Your Town project is expanding. Initially, the project brought together staff and pupils from eight schools, representatives from local services and engineers in Eastbourne to tackle issues such as air pollution, safe cycling and city centre traffic. The project now aims to visit several seaside towns enabling more young people to develop a project concept that they believe will enhance their town.

City Survival, London

Guerilla Science

Amount awarded: £29,800

The rise of megacities is the focus of the City Survival project in London. With cities rapidly developing and over 50% of the world's population living in urban areas, this project aims to bring engineers and artists together to empower young people and adults to discover future scenarios and develop solutions to the challenges surrounding increasing urbanisation and climate change. Through a programme of creative workshops, young people will work with engineers to produce school projects connected with the challenges of urban life.



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Ingenious Creative Futures: Empowering Engineering Outreach, London

Imperial College London

Amount awarded: £29,760

The 4Cs – Creativity, Communication, Critical Thinking and Collaboration Skills, have been identified by the World Economic Forum as crucial for the innovation-driven economy of the 21st century. Ingenious Creative Futures will provide training for engineers to deliver engineering workshops for students aged 9-16, focusing on the importance of the 4Cs. The workshops include low-cost team-based activities covering structural robotics, global positioning, structural and environmental engineering.

Escape the Classroom: Contamination Busters, Cranfield

Cranfield University

Amount awarded: £25,344

Taking inspiration from escape-room games for adults, pupils will solve environmental engineering problems in a scenario-based learning environment. The pop-up Escape the Classroom activity will utilise Cranfield University's state-of-the-art visualisation facilities, which provide near real-time data from an on-site treatment works. Pupils will complete a series of problem-solving tasks to identify the cause of contamination, possible effects on the environment, and ultimately how to treat it and escape the classroom (laboratory).