

Spring 2021 Funded Projects

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Primary school successes, ages 4-11

Curious Investigators

One Tenth Human, North West

Curious Investigators is an innovative partnership between award-winning theatre company One Tenth Human and Lancaster University's world-class Engineering Department: a live digital adventure that will Zoom directly into classrooms across Morecambe Bay (future home of Eden Project North). This bid is to support delivery in schools in autumn 2021 and to develop and deliver an innovative follow-up live via Zoom, in partnership with our local STEM Ambassadors Hub: "This Is Me Key Stage 1". At least 500 Key Stage 1 children will meet "Investigator Toni" via Zoom. Toni's unexpected and magical adventure requires the children to create prototype inventions in the classroom to help solve her challenge: how to return a mysterious egg to a nest on her windowsill. Having discovered what awesome engineers they can be, the children will meet at least two real life engineers via a Zoom hosted by Toni. These STEM Ambassadors will have been specially trained and supported to develop short, engaging presentations introducing themselves and their work to young children. 5-7-year olds will discover how real engineers grapple with their own challenges and prototypes; how diverse engineers are; and how fascinating their work is. Finally, they'll have the opportunity to take their newfound enthusiasm into an even bigger challenge: each school will host a live workshop session, using simple machines to create an amazing Egg Returner device, with support from LU engineering outreach experts.

Whitchurch Children's Festival

Whitchurch Conservation Group, South East

Whitchurch Children's Festival is an outdoors arts festival on Saturday 31st July and Sunday 1st August 2021 (10am-5pm) to be held at the water meadow by the River Test at Fulling Mill in Whitchurch, Hampshire. The uniqueness of the festival is as much afforded by its special location; it is one of the few places in North Hampshire where the public can access the River Test and its SSSI (Special Site of Scientific Interest) riverbanks. Over the course of the two-day festival, a STEM element will be introduced, so that children learn about the industrial heritage of Whitchurch. Hands-on workshops will help primary-school aged children learn how the River Test has powered the mills on the River Test for over 200 years, how the waterwheel transfer's power. The workshop activities will investigate materials, types of waterwheels and gears and pulleys.

Stemmed is a female-run magazine aimed at getting young women into STEM. Every member of the Stemmed team is a woman who is either currently in university or is working in the STEM industry. They will be running a stall with an experiment looking at how moving water can be used to generate energy to power machinery, to do this they will create a hands-on, interactive experience for the children involving a DIY mini replica of Whitchurch Silk Mill.

Primary and Secondary successes, ages 7-14

H2 the Future

North East Environment Networking Limited, North East

We wish to engage young learners, from diverse backgrounds, in understanding the emerging hydrogen generation and use economy in the Tees Valley and South Durham region. We will do this by running fun and inspiring practical activity sessions in primary and secondary schools, with the pupils designing, building, and trialling hydrogen powered vehicles. Through the project we hope to: enable the young people to appreciate the importance of STEM subjects; enthuse the young people about engineering generally; and inspire the young people to seek out careers in engineering (particularly in this emerging field).

Engineering ZERO

STEMFirst Ltd, North West

Engineering ZERO is a STEM programme focussing on the engineering aspects around the environment and carbon emissions. It consists of a game where students are given a starting Carbon Footprint and work in teams to solve a selection of STEM Challenges that if successful will reduce this Carbon Footprint to net-zero. The winning team reaches a footprint of net-zero first.

Engineering ZERO links to the KS2/KS3 curriculum in, Maths, PSHE (Personal, Social, and Citizenship). Pupils will develop their own skills whilst understanding how Engineering/STEM can tackle environmental issues and how Engineers develop clever solutions to protect our planet and resources whilst providing the infrastructure for the future.

Engineering ZERO consists of a virtual set of resources supplemented by STEM Ambassadors and Engineers telling their environmental-STEM stories and video briefs to set the challenges. Engineering and STEM are everywhere in our world, yet young people do not realise that Engineering is as much about process, safety, disposal, repurposing and improving as it is about 'making stuff'. This programme will give young people awareness of the environmental considerations of STEM, an insight into a broad range of STEM sectors and the chance to meet a wide range of role models from the Engineering and STEM. By utilising a train-the-trainer model as with our successful Engineering Fairy Tales programme we will ensure teachers, youth leaders and our STEM Ambassadors understand key STEM messaging, local and regional STEM priorities and how to signpost young people to future STEM opportunities.

Sustainable travel challenge for STEM Clubs

Graphic Science, South West

The Sustainable Travel project aims to inspire students to think about sustainability and pollution throughout an engineering challenge, starting from the investigation stage through to design and presentation. Greta Thunberg sailed across the Atlantic twice in 2019 to attend Climate change conferences, making a carbon neutral journey in both directions on two different sailing vessels. The Bristol Gulls, an all female team, rowed 3000 miles across the Atlantic in 2020/21 in the first ever specifically designed Eco Ocean Rowing boat. Renewable land vehicle challenges are entered by companies and universities annually as technology advances. This project will challenge schools to find unique sustainable solutions to long distance travel in line with the UN Sustainable development goal - Sustainable Consumption and Production. The project will deliver the sustainability and pollution message into schools, using unique resources developed in conjunction with The Bristol Gulls as a local example. Virtual support for each team will be provided by an engineer to share their expertise whilst highlighting the range of opportunities and subjects within the field of engineering. By undertaking this project and presenting their work, the students will develop teamwork and communication skills and an understanding of the roles of an engineer. Resources will be created to launch the challenges and provide background information. Success will be celebrated at an event to showcase the student work, attended by Engineers and The Bristol Gulls team. The resources developed will be available to run the challenges as CREST projects in future years.

Primary, Secondary and Further Education successes, ages 7-19

STEM Activity Day

St James Guiding, Greater London

We want to run a STEM day with a Girl Guiding family unit in SE London. We currently have over 100 girls participating in the unit and would anticipate at least 75 of them attending this event based on past experience. The event would be a day of STEM based activities to engage and encourage the girls in science and engineering, including exploring careers that are available. There is a Science and Engineering Careers Challenge badge which has 6 sections to it. It explores electronic engineering, mechanical engineer, data science, software engineering, physics, and science communication. We would be looking to run the activities in a day, with some follow up activities in the months to come. Inspiration will be taken from the Science & Engineering Careers Challenge badge, the Clever Cogs Engineering Challenge and the STEM Activity Pack provided by the 148th City of Edinburgh Guides. The guiding unit has been running meetings on Zoom for the past 12 months and we have missed out on a lot of science and engineering-based activities due to the nature of online meeting. We want to provide a day where the girls can meet face to face, even if it needs to be in a socially distanced way. Meeting face to face will allow them to spend some time with their friends, and provide some activities that a lot of them may be unable to afford to work on at home, whilst developing their skills and knowledge in an informal setting.

The Young Engineer Ambassador Programme

STEM Education Ltd, Northern Ireland

Post Primary Sixth form students from four schools will develop an "Engineering in a Box Kit." The kits will initially be used with their own school junior pupils and then with three local Primary schools or Community groups. A STEM Ambassador, IET Education Officer or IMechE Education Officer assigned to each team will support the development of the Engineer in a Box kits. The Young Engineer Ambassadors will receive credit for their work through the STEM Ambassadors Programme and the British Science association CREST Award scheme. The Primary school pupils will have an Engineering experience and receive a Discovery CREST award. Their teachers will keep the kits for future use. At the end of the programme there will be a celebration event with the Young Engineer Teams displaying their kits and the journey they have embarked upon. Engineers from a range of STEM Industries will be invited to judge their work and provide feedback. Participating schools and their parents will be invited to the celebration event to include the awarding of BSA CREST awards and prizes.

Boxcar Pedal Racers

Lemmiout Activities Ltd, All UK regions

Our Project Is designed to give students a challenge to work on that teaches them new concepts in a practical hands on fun way including simple engineering, science, design, simple calculations, presentations and above all fun. The activity (in a nutshell) is to build a pedal powered Go-kart that will take on a number of obstacles and challenges on their very own 'Race day'. "Boxcar Pedal Racers" is a scalable project for ages 7-20. The program is centred around a uniquely engineered pedal go kart which has a wide range of adjustability designed to represent some of the key aspects of designing a real-world vehicle. The aim is for students to design their kart to complete a series of obstacles in the fastest time on "Race Day". Each obstacle will test their kart and will favour some design features over others. The students will be taught the engineering principles behind the adjustment options available to them, then they choose the configuration they think will best suit overall. Adjustments will include turning circle, centre of gravity, gearing, track width, suspension travel, aerodynamics etc. For older students the complexity of the obstacles and the karts adjustments can be increased, and for younger ages it can be simplified. The project is customisable and can include a range of additional STEM skills depending on a school's requirements i.e. electrical circuits, bodywork. The project is exciting, and practical it uses basic tools and construction methods, providing an experience for students and staff alike.

Secondary and Further Education successes, ages 14-19

Prospering Peckham

Motivez C.I.C, Greater London

In the light of COVID-19, the Green New Deal is at the forefront of Southwark's recovery to help shape its economic future. To bring this to fruition, the "Prospering Peckham" project will help young people to be at the heart of the long-term strategy to reach the borough's climate change commitments by helping to cut emissions and becoming prepared for green, STEM-based jobs. "Prospering Peckham" will connect STEM employers with 60 ambitious students aged 14-16 at Harris Academy Peckham (HAP) to develop an engineering-based solution to mitigate the local pollution issues. Through a series of activities, talks, intimate workshops, and mentoring led by relatable young professionals and inspirational figures, the students will increase their awareness of how engineers can solve these issues. The students will also develop the soft skills such as leadership, public speaking, teamwork, and planning to become well-rounded engineers using social action as a vehicle. Here, they will build a campaign to advocate for their greener solutions to decrease the pollution levels around the community for the benefit of the residents, students, and businesses, underpinned by the engineering knowledge acquired over the course of the project. This will overcome employment barriers through increased visibility and engagement with diverse professionals. This will also build a community of young engineering leaders, strengthening their voices and increasing community cohesion through campaigning, bridging the intergenerational gap between the youth and the older generation in Southwark.