Spring 2019 Funded Projects

Engineering Escape Room
Petchey Academy
Greater London
Primary , Secondary

The Petchey Academy would like to use students to design and create an 'Engineering Escape Room' for both primary and secondary aged children to experience in the summer term 2019.

The aim of the escape room is to enthuse students about engineering and its application through problem solving activities. All activities will be linked to various career opportunities within engineering. Students will have the opportunity to evaluate their skills and enjoyment in relation to the different challenges. 700 children across 6 schools will participate in the Engineering Escape Room during a 2 week Engineering Focus which is part of the school's STEM programme.

They will work together to complete a series of tasks and challenges to escape the room within the timeframe allocated. The senior teachers at school will be filmed attempting the challenge, with a highlights video made. This video will then be used to launch the Engineering Focus and to mark the Escape Room open. We will be working in partnership with a local university and their cohort of engineering students. The game will be supervised by a qualified engineer and students from a local university. Following the game, students will have a careers related talk from the engineer who leads their session.

We will also continue our successful working relationship with Freewheel, an online digital media copmany which is part of the Comcast Group. We will take some of our students to visit their office as part of their initiative to recruit more women into digital engineering.

Aerospace and Aviation Camp
South West
Primary

This project will give children in year 5, across 17 Cornish schools, the opportunity to become fully immersed in the most exciting science project to come to Cornwall in generations - Spaceport Cornwall! The project will involve science teachers across 17 Cornish primary schools working together to develop 6 weeks of lesson plans and auxiliary learning resources which culminate in an Aerospace and Aviation Camp residential.

The plan is for all year 5 pupils (and subsequent year 5 groups there after) to take part in an immersive and inspirational term of activities around aviation and aerospace and for as many year 5 pupils as possible to have the opportunity for a weekend centered around careers and opportunities in aerospace. Aerospace and Aviation Camp will consists of the following activities: All year 5 children learning about aviation, space flight and astrology, linking into the Primary STEM curriculum for 6 weeks leading up to the camp. A Friday night residential i.e. sleeping in the dome over night with a space food super. A Saturday of activities in the school hall hosted by partner organisations – It is hoped that the list of partner organisations will grow as the Aerohub and Cornwall Spaceport develops but will start with Aviation Skills Partnership to talk about career pathways, Air Cadets, Cornwall Aviation Heritage Centre, Kernow Astronomy Society, Marjons Sports and Science Lab. A ‘camp graduation’ ceremony where pupils are awarded a certificate to acknowledge their learning achievement and the partners they have worked with.

Marine Engineering
Tile Cross Academy
West Midlands
Secondary

The Engineering Laboratory at Tile Cross Academy will provide excellent facilities to teach engineering to pupils at the school during curriculum time and members of the school's Sea Cadet unit as an extra curricular activity. In the evenings, at weekends, and during the holidays the facility will also be available to the Sea Cadet movement at a local, regional, and national level to run Basic, Intermediate, and Advanced Marine Engineering courses, both mechanical and electrical.

CIGPE STEM Engagement 2019
Channel Island Group of Professional Engineers
Channel Islands
Primary , Secondary , FE

The CIGPE STEM Engagement 2019 project consists of a variety of events held in both Guernsey and Jersey, aimed at increasing the awareness of STEM based subjects to involve young people with the engineering profession. The 2019 schedule consists of 9 different events hosted at various different locations accross the two islands. Each event is targeted at a specific primary or secondary school age group. The events are hosted at schools or public spaces (in the case of careers shows), run by members of the CIGPE committee and supported by school teachers and other professional engineers on the island where appropriate. All the schools events are interactive encouraging students to design, manufacture, test and improve concepts to achieve a goal. All the events are designed to have a tangible connection with "real world" engineering problems and often take on the theme of local engineering topics in the news. Students are all provided with Tomorrows Engineers carers handouts as well as the opportunity to speak to professional engineers for advice at all our events. The 9 core events are detailed below, however further to this the group arranges talks in local secondary schools in both islands for all 8 of our visiting speakers, these events have been run in this way for a number of years and have always proven popular. School lectures are considered to be cost-neutral as visitors travel expenses and overnight accomodation is covered by the public evening lecture budget.

Blackpoolrobo
Blackpool & the Fylde College
North West
Secondary , FE

This is a flagship series of very high quality robotics activities, developed and refined over several years, by local engineers and academic staff, aimed at engaging and enthusing pupils of secondary school age, who are either already demonstrating early signs of interest in engineering; or those who have yet to experience a really good engineering project. This year, the project will be focusing on how people can use robotics to simulate and emulate different human activities. Students will be introduced to programming, designing, building and operating robots to execute a wide range of everyday tasks. The participants will gain an understanding of the potential use of robots in different domains such as social care, healthcare, manufacturing, environment, transportation and construction. Each activity focuses on one particular domain where engineering can help improve and enhance lives. Students and their teachers will be introduced to aspects of coding for robotics, the social and technical impacts of robotics engineering with an ultimate aim of boosting their interest in engineering and introduce them to the many career pathways available in the field. The activity includes the following: Teacher CPD at Blackpool & the Fylde College, Advanced Technology Centre Scholarly research on STEM teachng, student motivation and engagement Initial Activity (local competition rounds) In schools across Blackpool Local Authority Final Activity at Blackpool & the Fylde College, Advanced Technology Centre

Educational Low Speed Wind Tunnel
D2H
South East
Primary , Secondary

The aim of the project is to design, build and use a Wind Tunnel to raise awareness and teach children about aerodynamics and its importance in modern day engineering for energy generation, drag reduction and making aircraft fly. Aerodynamics, the study of air moving over objects, has applications throughout engineering, for example in the design of aircraft, buildings, cars, trains, spacecraft and wind turbines. However, visualising or quantifying the impact of the air is problematic as it cannot be seen and easily measured, which makes giving young people hands-on experience to help their understanding difficult. The wind tunnel is the primary experimental tool that aerodynamicists use to develop and refine their designs as it provides a controlled environment in which forces can be measured and visualisations of the air flow can be performed. This project will see groups of students firstly contribute to the design and assembly of a small wind tunnel before that wind tunnel is taken more widely to classrooms and science fairs across the region to provide a tangible, tactile and visual tool to aid students in understanding the science of aerodynamics, the rigour of experimentation and the process of engineering design. The wind tunnel will allow the measurement of forces and pressures on wings, such as those used in aircraft and wind turbines, or Lego models to allow the children the chance to test their own creations. The aim of the project is to bring aerodynamics to life in an enjoyable and educational manner.

Physical Computing, Engineering, Robotics workshops including construction, electronics and programming
Scratch Code 4 Kids
South West
Primary , Other Independent workshops conducted on Saturdays and Evenings

The project is a development and growth of an existing series of workshops; which provide a fun, immersive, exciting, practical and structured insight into the engineering of all disciplines through the media of robotics. The workshops are held on Saturdays, Tuesdays and Wednesdays. All workshops are registered through the West England Hub of STEM Learning. Workshops activity is run in accordance with the Scratchcode4kids constitution and safeguarding policy. Scratchcode4kids is a not for profit organisation governed by a formal committee, supported by parents, who run the accounts. Workshops take children from the age of 5 to 14 through a journey of exploration of the building blocks of engineering, including electronics and programming. The building blocks are then combined and used to engineer working robots, escalating in complexity as the children become more proficient. The results are children used to working in collaborative creative environments, experiencing tangible feelings of achievement and self-confidence. These will be passionate ambassadors for engineering within their communities and the future of our nation's engineers. I am passionate about my workshops and have committed significant levels of personal finance (£7,000) to get the project up and running. I regularly commit 20 hours a week to STEM work and more recently more than 30 hours as I develop the enhanced workshops for this project. The success has outstripped my expectations and resources and I am looking for further investment to enable more children to engage in this exciting opportunity.

Walsall Engineers- Past, Present and Future
Blackwood School
West Midlands
Primary

This project is designed to give children opportunities to explore the different aspects of engineering. We want to change perceptions about engineering and show that there are chances for all children from all backgrounds. We want the children and parents to gain a better understanding of engineering. Ultimately we want to encourage children to take up STEM subjects at high school.The project is split into three parts and focuses on Walsall engineers. We felt that by linking the project to the children's locality they are more likely to relate to engineering and show that they too can be like these people in the future. The first part of the project is to show Walsall children that there have been great engineers who have manufactured great products over the last 200 years. The second part of the project is to show the children that there are people of Walsall developing and engineering solutions to everyday problems and selling these products around the world. We want to highlight the 'hidden engineers' as many of these industries are located in areas where children would not frequent.The final part of the project is for the ambassadors to upskill the teachers in engineering so they feel confident in leading future engineering projects. With the ambassadors help we want to inspire the children to design their own projects and see that there are many opportunities open to them in this industry in the future no matter who they are.

Mind The Language Gap
Business Language Champions
East Midlands
Secondary

Mind The Language Gap is intended to be our second cross-curricular event combining STEAM subjects and languages to show how languages are used in engineering careers. It will be run in conjunction with the Rail Alliance. Mind the Language Gap is a business language and engineering challenge aimed at students studying French, German or Spanish in Years 10 and 11, who would like to find out about international opportunities in the rail industry and put their language skills into practice. As well as putting 4 out of the 5 STEAM subjects into real-life practice, students will also practise language skills and key employability skills. It will be open to all schools. We intend to run this event twice in the academic year 2019/20, in Derby and in Yorkshire. The exact dates are to be confirmed with the venues. The rail industry employs 190,000 people in the UK and with its many partnerships on the continent offers ample opportunity to use languages and engineering in a business context. Both Yorkshire and Derbyshire are centres of the rail industry in the UK, so it is fitting that we are basing these events there. Mind The Language Gap is a one day event bringing in up to 14 teams of 6 students from schools across each region to compete in the challenge with a prize for the winning team. In order to win, the teams will need to show good engineering and design skills as well as good language skills and teamwork.

Beechview Science Hub
Beechview Academy
South East
Primary , Secondary

Our aim is to create a primary science hub, located at Beechview Academy. This will support the extension and enrichment of primary science teaching by improving the knowledge of primary teachers, and by supporting a range of locally organised science fayres. This work will be supported by a specialist Science teacher(s) from our partner schools, assisted in their outreach work by Sixth Form Science students and also mentored by professionals working in the field of science and engineering from our partner companies. Training will be provided on site at Beechview, a "lending library" of resources will be made available at no cost and sixth form mentors will be trained and offered to go out to work alongside primary teachers as mentors to the children, with professionals from our partners attending both at Beechview as part of the training, and as outreach to the primary schools, including support for the science fayres. The project therefore brings together the key elements of high quality STEM professionals, working with excellent A level Science students to train local primary classroom teachers for the benefit of a wide range of primary children all in a sustainable fashion.

Get ready to be Magnetised!
UTC South Durham
North East
Primary , Secondary , FE

Primary schools will be invited to work with UTC students on a STEM programme that will see UTC students delivering a series of sessions throughout the year using our outstanding facilities. Participants will be introduced to the world of engineering via our students, staff and our extensive range of industry and business partners all of whom are in the STEM sector. Participants will be invited to attend a programme of learning activities. Week one - introduction into engineering and STEM careers where they will also get the opportunity to science busk with our Science Magnets. Week two - an opportunity to work within our engineering hall with engineers from industry to support the students to learn, design and make a product. Week three - completing their project and evaluation about their initial three week programme. To ensure that learning continues throughout the year all primary students will be given a task book to complete and teachers will be given careers resources to ensure that engineering careers continue to be embedded in their curriculum. They will receive a visit from a STEM Ambassador and UTC student alumni who will deliver another activity with them. Participants will then be invited back to a celebration event at the end of the academic year where they will share their learning and take part in STEM activities delivered by a wide variety of industry partners. Once they have completed the project they will be 'magnetised' into entering an engineering or STEM related career!

Archway STEM Festival
Archway Learning Trust
East Midlands
Secondary

The 2019 Archway STEM Festival is free to attend and is intended to enthuse year 5, 6 and 7 children from across Nottingham in STEM subjects. Below are details about the 2018 event: Bluecoat Beechdale Academy was the setting for the third annual STEM Festival. Mad Science delivered another superb science show, and finished by launching a rocket – luckily it had a parachute to slow it down before it landed! The Institute of Engineering and Technology, who partly funded the event, delivered a circuit building activity. The University of Nottingham were again very supportive of the event, and their STEM buskers inspired the primary students with crazy experiments and demonstrations. The University of Derby made a full crime scene, and Nottingham Trent University showed the ingenious ways in which plants and animals shed water. The Institute of Mechanical Engineers ran a rocket launcher activity which was particularly popular. We had worms that had been sent into space, fingerprint key rings, fossils, robots, 3D printers, maths games and too many more activities to mention! Although we couldn't advertise it at the time, we had actual rocks from the Moon with had been brought back by the Apollo astronauts – it really was a once in a lifetime experience for those who got to hold them! What was particularly inspiring was seeing the number of students from across the Archway Learning trust deliver activities, and I'm sure that they inspired the engineers, mathematicians and scientists of the future.

LIVE O2 MARS
Engineering UTC Northern Lincolnshire
Yorkshire and the Humber
Primary , Secondary , FE

Live O2 Mars is a project aimed at promoting STEM to year 6 Students in local primary schools through biology, physics, maths and robotics. It is a 2 stage activity process, combing work in schools with visits to our college. Stage 1 is the use of a Martian Soil Kit to explore the possibility of growing plants on mars and the use of Crumble controls and tracked kits to make Mars Rovers. Stage 2 is a visit to our college to take part in a day of activities based around a Martian Exploration Theme. 1. Launch - Design and Launch an Air Rocket (the payload will simulate the seedling/plant grown in stage 1) 2. Re-entry - Design a capsule to withstand landing on mars (the payload to be protected will simulate the seedling/plant grown during stage 1). 3. Delivery - Design a Mars Rover to plant the seedling/plant grown in stage 1.

3D Virtual Reality Wind Energy Programme - STEM Peer Mentor development
University Technical College Norfolk
East Anglia
Secondary , FE

This project (co-developed by Vattenfall UK/3Dwebtech and UTCN) utilises innovative industry-leading wind farm development software and 3DVR technology as the stimulus for an educational team-based design challenge, building student's STEM skill development, leadership and employability. The concept was born from the need to stimulate student interest, awareness and informed consultation feedback about the emerging offshore wind energy sector (a significant provider of future energy and potential career opportunities - directly, through the construction processes/O&M and additionally, via the significant supply chain). The project was initially piloted and evaluated in a limited number of local schools. UTCN students showed such enthusiasm and aptitude, they were subsequently trained to deliver the programme, providing a more cost effective sustainable and inspiring peer mentoring model. These students proposed a wider outreach programme for schools across Norfolk and Suffolk. Their proposal provides an immersive experience that is engaging, fun, thought provoking and full of engineering, technical and business principles. The programme provides learning across the STEM framework including a detailed engineering design phase and wider social/environmental research. Students involved in the pilot programme gained confidence and expertise that has led to a variety of exceptional career opportunities (degree apprenticeships and internship opportunities). They are passionate about enabling this opportunity for their peers. In order to deliver the 20 sessions proposed (10/academic year for 2 years) an investment in hardware is required, and an IET grant could make their idea a reality. The equipment would then allow for cost effective ongoing delivery.

Principles of Flight - Balsa in a Box
Royal Air Force Marham STEM team
East Anglia
Primary , Secondary

'Balsa in a box' is an activity designed to enrich the curriculum using an interactive two hour session explaining the principles of flight while building and flying a simple balsa glider. With links to the curriculum for Key Stages 1-5 the activity can be delivered to up to 60 students. The kits produced, using the funding provided, will allow 60 students per kit to experience the excitement of building flying and perfecting their own flying machine. Delivered via Direct Engineer Engagement, Empowered and Mentored teachers or Indirect Engineer interaction the project will provide up to 3000 students and 100 teachers with this exciting opportunity to learn through doing. The model is simple yet adaptable and can easily fulfil the requirement of the various curriculum key stages, from basic balance and symmetry through to wing design, positioning and weight distribution factors. Forming the basis for scientific experimentation the glider can be use beyond the initial delivered session, or provide a fun take away for the younger age groups. Expanding on an already established session that we regularly deliver, this project, if funded, can increase the reach of the project 5-fold across the Norfolk region. If successful then these kits could be produced to support a wider are delivery project in the future.

Road to Engineering
BAE Systems
North West
Primary

Road to engineering (RTE) is a new interactive event, to be held within BAE systems (Barrow –in-Furness). The event will be held over three days; each day will see 150 Key Stage 2 (KS2) pupils attend from a range of local schools. The event will demonstrate to the pupils that engineering is a wide and diverse subject, offering a unique range of experiences to anyone who is interested in progressing into the field. Through discussion with the participating schools, it was discovered that there are certain areas of the curriculum that are 'difficult to cover', for example light and sound or electricity, so the programme of activities will relate to these topics. The event itself will incorporate historical engineers from the local Furness area. These engineers are from a range of backgrounds such as Dorothee Pullinger who oversaw a munitions facility in World War I or James Ramsden who was Managing Director of the Barrow Shipbuilding Company. By including these figures, the event team hopes to highlight that engineering is an inclusive field and the local area has a rich history of esteemed engineers. If successful, the EEGS funding will be utilised to help create interactive activities for the pupils. These will demonstrate; how sound travels, quality control and testing done on site, interactive puzzles utilising virtual reality, electrical circuit design and a brief talk from a senior engineer within the business.