



Employment and Skills Board

Education and Industry

STEM Programme

Projects | South
2016-2017



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INTRODUCTION

The Education & Industry (E&I) STEM Programme was created to tackle the ever growing skill shortage in STEM careers. Nationwide counties have identified a decrease in suitable STEM applicants. This programme aims to rectify this by working with a select group of schools that have identified 30 young people who have the ability/passion to pursue STEM related careers.



CHANGES FOR 2016-17

- Schools need to identify a core group of circa **30 students in years 9 and 10**
- Certificates will be given to the students at the end of the two year programme
- Schools will pick a **minimum of one project for each term**
- We will help support 1-2 enrichment days to inspire pre-GCSE students to think about STEM subjects
- It is envisioned that schools will use their minibuses for travel. On occasions where this is not viable please contact your Skills Manager.

CLAIMING FUNDING

We will endeavour to support the best we can on any projects/events we have listed; if a school wishes to claim any financial help please check with your Skills Manager first before making arrangements.

We have strict procedures regarding the end of the financial year. This means we cannot retrospectively pay for anything after we have submitted our accruals in March 2017. Please be diligent regarding any funding promised – we will send reminders at the end of the year but be aware that without your input your school may miss out.

2016-17	First day of term	Last day of term
Autumn Term	Thursday 1 September 2016	Friday 21 October 2016
Autumn Term	Monday 31 October 2016	Wednesday 21 December 2016
Spring Term	Thursday 5 January 2017	Friday 10 February 2017
Spring Term	Monday 20 February 2017	Friday 31 March 2017
Summer Term	Tuesday 18 April 2017	Friday 26 May 2017
Summer Term	Monday 5 June 2017	Friday 21 July 2017

E&I STEM PROGRAMME CONTACTS

Richard Bambridge
 Skills Manager
 richard.bambridge@essex.gov.uk
 03330 130912
 07740 901162

Madison Eisenstadt
 Senior Skills Officer
 madison.eisenstadt
 @essex.gov.uk
 03330 131289



Ri Science Show - Explosive Food Event | Future of Essex EDA winner 2016

Look out for these symbols to give you a guide as to what you can expect from the events below:



Careers Event



Industry Visit



Mentored
Projects



Work Experience

ENRICHMENT DAYS

PROCAT Young Engineers Club



Target Year Group(s): Years 8-9

Participant Numbers: 14

Date: Spring and Summer options however there are limited spaces so please notify interest as soon as possible

Attendance of the PROCAT Young Engineers is an opportunity to extend an interest in engineering and learn new skills. This invite only club runs for 2 weeks and involves parents/careers undertaking a project alongside the students. The aim of the course is for each participant to engineer an item to keep. The manufacturing process will involve real life application of maths as well as developing hand skills when working with wood and metal. There will be time to talk to PROCAT tutors about their time in industry and find out about routes into engineering careers.

Engineers Week at PROCAT



Target Year Group: KS4 or KS5 Engineering students

Participant Number: 14

Date: 19-25th February 2017

Have your engineering students considered their next step into technical professional careers?

Visit the UK's first college of advanced technology during "Engineers Week 19-25th February 2017" to find out about pathways into professional technical careers. 98% of apprentice graduates gain full-time employment in their chosen career. Our technical courses are designed to provide students with the academic and practical skills needed to move into a successful career. Try activities in our fully kitted workshops where our specialist facilities aim to provide a learning experience that is close to industry.

National Apprenticeship Week at PROCAT



Target Year Group: Year 9-10

Participant Number: 14

Date: 14-18th March 2017

If you have students with ambitions to start an apprenticeship in the engineering or construction industry then this is a great opportunity to meet with employers. There will be representatives from advanced manufacture, transport engineering, construction and building services to talk to as well as a variety of hands on tasks. PROCAT would like to work with schools to follow up this event with visits to employers in order for students to get a taste of industry.

QinetiQ Projectile Power!



Target Year Group(s): Years 9-11 (negotiable)

Participant Numbers: Up to 16 students

Date: Negotiable



QinetiQ is inviting teachers and students to spend a day on the live weapons testing and evaluation Range at Ministry of Defence, Shoeburyness.

The day kicks off with an introduction to the Range and the QinetiQ's work with the **UK Armed Forces**. Then follows an exclusive visit to the main large calibre gun firing battery where students can find out what goes on during weapons trials and test the velocity of their kick using the hi-tech instrumentation. In the afternoon, students will be split into small teams and will be given their own Trebuchet to experiment with, testing trajectory, velocity and accuracy. The team that produces the most accurate performance wins the challenge!

Royal Institution Science Shows



Target Year Group(s): Years 7-8

Participant Numbers: Up to 450 students and 30

Staff members

Date: Negotiable

These shows are jam-packed with experiments, demonstrations and the odd explosion! The shows give students, teachers and families a chance to see the **Royal Institution's** specially trained presenters in action, delivering science shows to your students in the school setting. The RI's presenters will deliver two or three science shows to students, and a **CPD session** for teaching staff.

STEM Speed Networking Event



Target Year Group(s): Years 9+

Participant Numbers: Negotiable

Date: Negotiable

STEM Speed Networking is an event which allows students to interact with local STEM industries. Students will gain a better understanding of their local offer and may even develop key contacts which will help them with their post-secondary career choices. Please notify your Skills Manager if you wish to run a bespoke STEM Speed Networking Event in your school.

Upscience Enrichment Days



Target Year Group(s): All

Participant Numbers: Negotiable

Date: Negotiable

Upscience have a catalogue of STEM based workshops and presentations ranging from Rocketry, Aerodynamics, Aviation, Electronics, Microcontrollers, Telemetry, Hydraulics, material sciences, Engineering History, Enterprise and many more. These workshops are suitable for opening events, science and STEM festivals, maker fairs, transition weeks and enterprise weeks.

STEMillions – The new school based club



Target Year Group(s): All (Girls Only)

Date: To be determined by the school

STEMillions⁺

STEMillions is not like your usual school club, this is about empowering the girls to run their own club and providing a support network from industry, facilitated by the Stemettes. The emphasis is on passing it forward: both the girls to other girls and from industry to the girls - increasing their general skills and awareness of STEM roles and their variety in everyday life..

NEW Battelle Open Evening



Target Year Group(s): Years 9+

Participant Numbers: Limited to 100 spaces - please confirm interest asap

Date: Spring Term – 16 March 2017

5.30pm-8.00pm

Battelle UK

Every day, the people of Battelle apply science and technology to solving what matters most. At major technology centres and national laboratories around the world, Battelle conducts research and development, designs and manufactures products, and delivers critical services for government and commercial customers.

For science enthusiastic young people, Battelle will be opening its doors at its Chelmsford labs allowing students to get better insight of analytical chemistry in the work place. Students will get to have a tour of the lab, talk to staff, and a hands-on experience with chromatography.

This is an offer not to miss; being one of the premier science firms in the county Battelle offer many opportunities (including apprenticeships); so ensure your students who are interested in science based careers attend!



CONSTRUCTION



NEW South Essex College Construction Taster Days



Target Year Group(s): Year 9
Participant Numbers: Up to 100 in total
Date: TBC 18th or 25th May 9am – 2.30pm

A day long taster session for year 9 and 10 students particularly interested in a future career in high-end construction roles. Across the day there will be a series of 4 fun, one hour long hands-on workshops inspiring young people to think about roles and opportunities in the sector.

NEW Civil Engineering Masterclasses



Target Year Group(s): Year 9
Participant Numbers: Schools to nominate up to 6 students
Date: ProCAT, Basildon. 6, 13, 20 May 10am-12.30pm

A masterclass is a hands-on session where students work on a task or activity (usually in groups). They are fun, stretching and challenging and will give students an insight into professional and technical roles in the construction sector.

The series is planning to run over three consecutive Saturday mornings from 10am – 12.30pm. Each session is delivered by a different ambassador and seeks to cover a different aspect within to civil engineering eg design, planning, estimating, surveying, architecture etc.

CITB CREST AWARDS



Target Year Group(s): Year 9-10

Date: Throughout the academic year

The CREST Award scheme is managed by the British Science Association and helps young people to discover their passion for STEM subjects. Many CREST projects develop students' knowledge and skills, supporting their attainment in national curriculum subjects and qualifications. CREST Awards are highly regarded and are the only STEM scheme endorsed by UCAS for students to highlight in personal statements.

The Construction Industry Training Board has developed three CREST challenges for construction and the built environment – 'Sustainable Communities', 'Building Bridges' and 'Casement Park SOS'. Available at Bronze, Silver and Gold levels, students will be supported by CITB professionals and afforded the opportunity to gain exposure to the local construction sector.

SCIENCE



Army 'New Science Workshops'



Target Year Group(s): Year 8-9

Date: Negotiable

The Army have developed a suite of three science-based challenges focused on a humanitarian mission scenario. These show the real outcomes of practical science as part of the Army. The activities have been expertly designed and developed in collaboration with the Defence Science and Technology Laboratory and the Institute of Naval Medicine.

BIOLOGY

Subject link: Nutrition and digestion

Students will design an all-in-one ration snack, taking into account energy and nutritional needs when expending a lot of energy. The snack needs to provide the right balance of nutrients and remain safe and stable under a wide range of temperature conditions.

CHEMISTRY

Subject link: Materials (properties of ceramics, polymers and composites).

Students look at how to design a protective, lightweight helmet made of composite material. It must be strong and resistant and allow a range of accessories to be attached. Students need to explain how they have combined materials with different properties to provide comfortable, lightweight protection.

PHYSICS

Subject link: Heating and thermal equilibrium and physical changes.

Students look at designing and explaining how a cooling suit will remove heat and allow soldiers to work safely and in comfort without overheating in tropical/ arid environments.

Army 'Forensic Challenge'



Target Year Group(s): **Year 9+**

Date: **Negotiable**

Think **Army** meets CSI. This exciting new workshop challenges students to use science-based activities to explore the ways in which crime is investigated. The task takes students through an interactive experience that tests their observation, communication, team building and problem solving skills, as they uncover clues and learn about forensic science techniques used in the real world.

ADVANCED MANUFACTURING AND ENGINEERING



ADS UKAY RoC Build a Rocket Competition



Target Year Group(s): Open to all year groups with no team member cap. Please note ECC will only fund teams consisting exclusively of E&I STEM pupils

Date: August 2016 competition opens, rocket launches in April 2017



!!Registration is now open!!

The UK Aerospace Youth Rocketry Challenge (UKAYRoC) has proven a huge success in recent years. Teams of students are tasked with building rockets in order to reach a target height, release its payload and see it return to Earth unscathed. Organised by **ADS**, this is an exciting way to learn more about maths and science, with the UK winners getting to compete with international winners.



UKAYRoC - Regional winners Shenfield High School 2015 | National third place winners Stewards Academy

Bloodhound Microbit Car Challenge



Target Year Group(s): Years 7-8

Participant Numbers: Teams of four to six students

Date: Register date is 30 Sept with competitions in Nov 2016, Feb 2017 and Finals in July 2017



Teams are tasked with building a model rocket-powered vehicle integrating Micro:bits that have been coded to act as accelerometers that will be 'fired' through a timing gate, along a steel wire. Schools will be linked, prior to the final competition event, to engineering experts to support the design and build process.

Bloodhound Car Challenge (Non Microbit)

Target Year Group(s): Years 9-10

Participant Numbers: Teams of four to six students

Date: Summer Term



Teams are tasked with building a rocket-powered vehicle that will be 'fired' through a timing gate, along a steel wire. Schools will be linked, prior to the final competition event, to engineering experts to support the design and build process. Teams will compete against students representing schools across Essex.

Drone Workshops



Target Year Group(s): Year 9

Participant Numbers: Up to 30 students in total

Date: Summer term

Students will have the opportunity to build and fly drones, with support from experts. Workshop delivered at **Stow Maries Aerodrome** on Saturdays. We require commitments of a minimum of three workshops.

Ford Higher Apprentice Challenge

Target Year Group(s): Year 9-10



Participant Numbers: Two teams of five students

Date: 5 – 28 June 2017



Please note – following the first edition we already received a number of nominations. You can still nominate your school but be advised your school will be put in a waiting list and there is **no guarantee.**

Ford Motor Company UK Higher Apprentices will assist students in teams of five to take part in an Engineering and IT challenge. Students will design, build and develop a vehicle with a braking system to safely transport an egg for the engineering challenge. The IT challenge will see students from schools design and produce a digital experience based on their vehicle. The experience will be in the form of a website, video, or promotional presentation and will include

multimedia elements to show off the masterpieces. Last year's winners of the Ford Higher Apprentice Challenge won an exclusive week of work experience at Ford!



Ford Higher Apprentice Challenge - Ford Motor Company UK

NEW Leonardo's Rampaging Chariots Challenge



Target Year Group(s): Year 9-10

Participant Numbers: Teams of 3-4

Date: Nominations should be registered in January for the Summer term

Limited places available for this competition, please nominate yourselves in January and we will notify you if you have gained a place.

The Rampaging Chariot is a powerful, radio controlled featherweight sporting robot provided as a mechanical and electronic kit for teams of young people; demonstrating the principles of robotics, basic electronics, woodworking, metalworking skills and project management.". The competition allows each school team of 3 or 4 members to compete in three separate activities. Everyone competes in a timed assault course and there is a choice of two 'strength' events - a tug-of-war and a sumo style wrestling competition where Chariots try to push one another out of the arena! Finally teams of two Rampaging Chariots compete in a football match demanding skill agility and strength.



Pi in the Sky



Target Year Group(s): Year 9-10

Participant Numbers: Groups of four

Date: Summer term

Students will be asked to assemble, program and test a device capable of tracking the location of a high altitude balloon. They also have to design and assemble a suitable payload container, considering environmental conditions in flight and safety on landing while monitoring and capturing data throughout the flight for analysis afterwards. In this project students learn the basic operation of a raspberry pi, along with its applications and limitations. Students also learn basic theory of radio and frequency-shift keying (FSK) modulation, along with how it is used to send data.



Boswells Pi in the Sky

PiBots

Target Year Group(s): Year 9-10

Participant Numbers: Groups of four

Date: Spring term (negotiable)



Students are tasked with designing a Raspberry Pi controlled, programmable buggy. Using a Raspberry Pi and its GPIO pins, your students can program the PiBot in whatever language you like, from Scratch, to Python and C, via Basic, Logo etc. Anything else that works with a Pi can be interfaced, so that means, Raspberry Pi camera, WiFi, LCD screens - the sky's the limit!

Little Planes – Work Experience

Target Year Group(s): **Year 9**

Participant Numbers: **Up to 30 students in total**

Date: **10-13 April, 2017**



Students will have the opportunity to build little peddle controlled planes, with support from experts. Workshop delivered at **Stow Maries Aerodrome** on Saturdays. We require commitments of a minimum of four workshops during Easter Break.



Little Planes – Stow Maries Aerodrome

HEALTH AND CARE



Developing Careers in Health at ARU



Target Year Group(s): Years 12 who are considering a Health or Social Care pathway. They do not have to be on H&S Care courses specifically

Participant Numbers: Up to 80 in total

Date: February 2017

Health and Social Care students will benefit from a range of presentations and activities, delivered by staff at **Anglia Ruskin University** and industry representatives, serving to highlight the variety of Health-related careers and courses on offer at the University.

The day will begin with a short opening presentation from ARU, students will then move to a speed-networking session with Health and Social Care professionals, and then after lunch they'll be rotated around a number of shorter sessions highlighting ARU undergraduate courses in either Health or Social Care. Before leaving the University, ARU will offer students assistance in the future with their UCAS personal statements. The likely session topics through the day will be; Medical Science, Pharmaceutical Science, Operating Department Practitioner, Medical Technologies, Paramedic Science, Nutrition, Social Care & Social Work.

LOGISTICS



European Supply Chain Days

Target Year Group(s): Years 9-10

When: 21 April 2017



After the success of the first two European Supply Chain Days, the Chartered Institute of Logistics and Transport (CILT) is pleased to announce that European Supply Chain Day 2016 will take place on April 21st.

The European Supply Chain Day is a unique and exciting opportunity offering a hands on experience for students to better understand the opportunities in this industry.



THE EDUCATION & INDUSTRY STEM PROGRAMME

LOGISTICS IN SCHOOL DAY

The Essex Education & Industry STEM Programme is looking to promote Logistics to students through a day of fun, immersive and interactive activities designed to develop young people's understanding of logistics.



FREE FOR SCHOOLS



YEAR 8 STUDENTS



1 HR 20 MINS
X 3 SESSIONS

Nova Engage Virtual Reality (VR) Experience



Student will use the Development Kit 2 (VR Headset) and CastAR, Driving Simulation Equipment with Haptic Feedback (for realism) and Software like EuroTruck Simulator to produce a gaming / driver experience that's both fun and engaging.



Business on the Move Board Game

Business on the move is an educational board game to excite and inspire (young) players about global supply chains. The game was developed by two former teachers to support schools to develop partnerships with business. The aim of the game is to;

- Run a logistics business, delivering orders to customers
- Transport goods by air, sea, rail and road from China to customers in the UK
- Aim to be the first to complete deliveries and / or to make the biggest profit

INDUSTRY

Industry will bring equipment along to show to students – ideally it would be of interest to bring a lorry if the school has the capacity to fit this on site. Industry would also talk about their careers plus a Q&A opportunity.



HOW TO GET INVOLVED

How the day will work

Students will be split into 3 groups of 50. Each station will run for 80 mins; after which students will rotate to the next activity.

Schools will provide the venue and also tables and chairs.

Requirements

The day is entirely free for schools however if cancelling with less than 6 weeks costs may need to be recovered.

Schools are promising to provide 150 year 8 students.

Students are required to attend all 3 sessions.

To allow adequate organisation we are suggestion this date be run in March.

Register Interest

- STEP ONE** Confirm interest with the E&I STEM Team
- STEP TWO** Identify a date in March you would like to host this session
- STEP THREE** Confirm venue availability (2 rooms capable of hold 50 students at a time + school grounds and class room)
- STEP FOUR** Send over a list of 150 year 8 student names who will be taking part

ROYAL INSTITUTION MASTERCLASSES



Ri Computer Science Masterclasses

Target Year Group(s): Year 9

Participant Numbers: Schools to nominate up to four students

Date: Saturdays – 6, 13, 20 May + 10, 17, 24 June 2017



These **Royal Institution** Masterclasses are designed to encourage, inspire and engage young people in the subject of Computer Science.

Masterclasses are organised regionally and take place on Saturday mornings, with able and mechanically minded students attending from local schools. There are typically at least six 2½ hour classes in each series, with each class being given by a different speaker who is passionate about sharing their own experiences and enthusiasm for the subject. Speakers come from variety of industries, academic and teaching, and topics have ranged from cyber-security to information technology.

Series to be hosted at The Billericay School, Billericay. It is expected that students will organise their own travel.

Customised Projects

Please note that the Education & Industry STEM team are happy to help create personalised projects with your school. If you have an ideas please let us know as we can help assist.

Other STEM Projects

If there are any other STEM projects which you are aware of that your school would like to take part in, please notify us.

Work Experience

As part of the Education & Industry STEM Programme we endeavour to offer all students relevant work experience in one of the seven priority sectors. Please send CV's as soon as possible along with comments on what industry each student is interested in. A special note to make – we are currently working with the ICHEMI to organise chemical engineering placements.

Industry Visits

As a part of our offer we are able to help with bespoke industry visits. Please let our team know the type of industry you are interested in and suitable dates.

In Curriculum Support

If you would like to arrange industry to help with the delivery of specific topics in the curriculum please do make us aware.

ACTIVITY PARTICIPATION FORM

In the boxes below please select the activities that you would like your school to take part in for the 2016-17 academic year. **You will need to provide us with notice of six weeks if your school can no longer participate in the planned activity.** Date confirmations, reminders and relevant information will be sent for each project when appropriate.

Please note	Please tick (ensure a minimum of 4 projects over the course of the year have been selected)
Spring Term Activity	
ADS Build a Rocket Competition (Project)	
PROCAT Young Engineers Club	
Engineers Week at PROCAT	
National Apprenticeship Week at PROCAT	
Battelle Open Evening	
Developing Careers in Health at ARU	
Pibots (Project)	
Little Planes (during Easter holidays)	
Summer Term Activity	
Bloodhound Microbit Car Challenge (Project)	
Bloodhound (Non Microbit) Car Challenge (Project)	
Ford Higher Apprenticeship Challenge (Project)	
Pi in the Sky (Project)	
Ri Computer MasterClasses (Project)	
Construction Taster Days	
EDT EES Event (Project)	
CILT European Supply Chain Day	
Rampaging Chariots (Project)	
Civil Engineering Masterclasses (Project)	
Ri Computer Science Masterclasses (Project)	
Pibots (Project)	
Drone Workshops (Project)	
PROCAT Young Engineers Club	

Dates convenient to schools (Specify a term where applicable)	
CITB Crest Award	
QinetiQ Projectile Power	
Royal Institution Science Shows	
STEM Speed Networking Event	
Upscience Enrichment Days	
In Curriculum Support	
Industry Visits	
Army 'New Science Workshops'	
STEMettes	
Army 'Forensic Challenge'	
Logistics Day in School	
CILT European Supply Chain Day	

School Contact Details			
School Name & Address			
Lead Teacher Name (MR/MRS/MISS/MS/DR)			
Email			
Signature		Department	
Additional Staff		Phone	
Teacher Name (MR/MRS/MISS/MS/DR)		Email	

Comments