



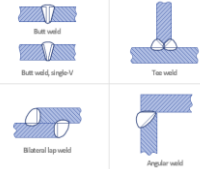

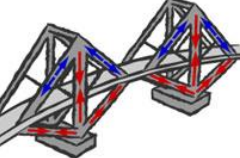







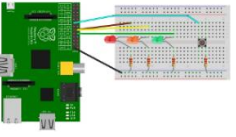



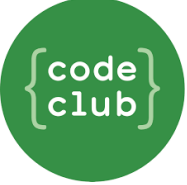









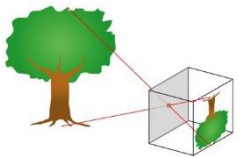



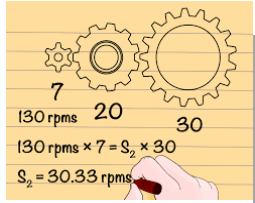

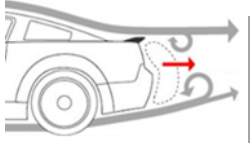



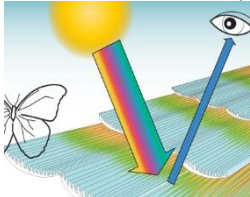

# STEM Fair 14<sup>th</sup> June



## Young Investigators Workshop Programme





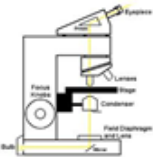



Year	Description	Provider
	<b>Civil Engineering</b>	
	Power for Everyone Everywhere	Engineers Without Borders
	The student group <i>Engineers Without Borders</i> is leading this cross curricular activity which links Science, Engineering, PHSE and Citizenship. Pupils are challenged to solve a major development issue – renewable energy - with the limited resources available to engineers in third world countries.	
	3D Solids and Tessellation	STEM Team East
	Showing images from nature and great architecture from around the world we explore symmetry, tessellations and 2D to 3D shapes. Pupils see how mathematicians use this study of symmetry and solids to explain and develop ideas in modern living. Pupils make a cubohemioctahedron or a flexi hexagon.	
	Chocolate Welding	The Welding Institute
	Working with the engineers from The Welding Institute - a world leader in welding- pupils learn about materials, joining, forces and structures in this fun, hands-on workshop using everyone's favourite food - chocolate.	
	Multistage Bridge	STEM Team East
	Pupils learn from first class engineers about bridge design and construction. Working with just paper, pupils experience first-hand how weak materials can be turned into strong structures resisting tension and compression. In small teams the pupils construct sections of truss and abutments to complete a multistage bridge.	

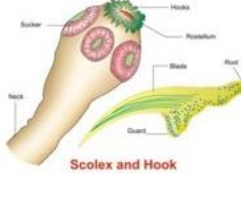





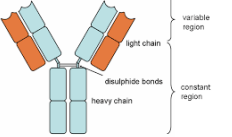



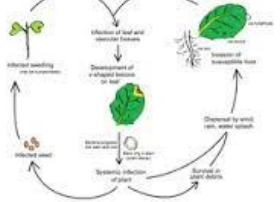

Electronics & Computer Science		
	Mobile Apps	Softcogs Ltd
	Pupils learn about the code behind Mobile Apps. Together with David Hurren - a very experienced software engineer - the pupils learn to translate the required operation into a logic sequence of commands. These commands are then encoded in Javascript to create a brand new App!	
	Bug Your Bedroom	Centre for Computing History
	Pupils will work with the Centre of Computing History staff to learn how to code. Using Raspberry Pi Computers the pupils write code to detect when someone enters the bedroom and how long they stay there. By remotely controlling a camera the pupils can gather the evidence and catch the culprit!	
	Animatronics	STEM Team East
	Pupils gain insight in the controls that give robots life-like characteristics. This workshop is an introduction to electronics and computing. Pupils assemble a bird-like robot to their own design, learn how to program his heartbeat and watch the robot come to life with the use of sensors and motors.	
	Traffic Lights	gPio
	Pupils will learn from Trevor Olsson how to code in Scratch and control traffic lights with a Raspberry Pi. The software Scratch is free and readily available to schools, so that pupils can continue to develop these skills back at school.	
	To Code or Not to Code? – BBC Microbit	STEM Team East
	All Year 7 students will soon receive a BBC Microbit processor so they can learn to code. This workshop show pupils how to code the Microbit as a raindrop counter.	
	Code Club	STEM Team East
	We hope to have support from the Raspberry Pi Foundation and all Code Club Ambassadors to run some Code Club material. This would help schools to set up their own Code Club at school and use the free on line resources	

Chemistry		
	Ice Cream Science	STEM Team East
	Pupils learn about the properties of phases, emulsions and crystals by mixing milk, salt, sugar and ice. Only if the pupils manage to get the perfect mix and the right amount of stirring there will be ice cream as reward!	
	Polymers & Plastics	University of Cambridge
	Chris Hulme Smith and colleagues from Cambridge University will explain polymers and plastics. Pupils will get to examine the properties of polymers and plasticity and see the effect of heat in changing the properties.	 UNIVERSITY OF CAMBRIDGE
	Acids & Alkalis	STEM Team East
	In this Chemistry workshop pupils learn about pH scale and identify acids and alkalis from among a selection of food ingredients. They then make molecular structures of some common acids and alkalis	
	Philae Lander - Research in Space	STEM Team East
	In November last Year the Rosetta Space Craft dropped the Philae Lander probe on Comet 67P. This Lander was a fridge size Research Lab. Pupils learn what the probe was investigating and how it landed on the comet while making a model Lander with flashing LED	
Physics		
	Light & Camera	STEM Team East
	Pupils learn about properties of light using our light kit donated by The Ogden Trust. Pupils make a pinhole camera to understand how all cameras work based on the properties of light and laws of physics. These properties for the basis for applications in innovative technologies like optical fibres.	

<b>Mechanical Engineering</b>		
	Engineering Challenge - Gears	STEM Team East
	Pupils learn about the use of gears to adjust direction and speed of motion. The pupils can put this knowledge to use in an engineering challenge. They are asked to work as a team of engineers to build a working model to a specified set of specifications.	
	Wind tunnel	Marshall Aerospace & Defence group
	Pupils learn about the aerodynamic forces resisting vehicle movement. The pupils get to redesign a standard car to improve the fuel efficiency. Testing the new model in the wind tunnel the pupils can verify the streamlines around the car.	
	The Science of Vacuums	Ogden Trust
	What happens when we remove air? How do we create a vacuum and why is vacuum important? Dr Matt Cole of Cambridge University will lead this workshop with interesting demonstrations on vacuums.	
	Jaguar LandRover	
	This workshop involves 6 classroom activities to teach automotive manufacturing processes. The activity involves making interior components using automotive manufacturing techniques, then assembling the components into a car body. The activity demonstrates injection moulding, compression moulding, extrusion, casting and pressing, all using classroom safe materials and techniques.	
<b>Life Science</b>		
	The Science of Butterflies	STEM Team East
	Pupils learn about the importance of colour in the life cycle of a butterfly. Surprisingly the colour of butterfly wings is not created by pigments. The properties of light are at play here! Pupils can test their understanding of the principles of light reflection on the wing surface by making an origami butterfly!	

	<p>Plant &amp; Animal cells</p> <p>Pupils learn about the cell as the building block of life. The pupils make models of plant and animal cells, simple and specialised. We look at blood cell and their different functions.</p>	<p>STEM Team East</p> 
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	<p>Sherlock - Forensic Science</p> <p>Are you Duxford's answer to Sherlock Holmes? A body has been found in the museum. Help our forensic scientists solve this whodunit by applying hands-on Science.</p>	<p>British Science Association</p> 
	<p>Play With Proteins</p> <p>Experience the process of digestion from the point of view of a protein. Find out how the body makes what it needs from what you eat. Pupils will review and consolidate knowledge of food groups and their importance in the body. The focus of the workshop is on protein so pupils will learn, through modelling, the basic structure of proteins (amino acids) and will build their own. They will then link back to where we get protein from (diet) and look at the process of digestion.</p>	<p>Cambridge Science Centre</p> 
	<p>Microscopes and Pond life</p> <p>An exciting workshop for pupils to learn how microscopes work and use them to examine the microsystem of ponds. Pupils examine and compare a lot of different cell types found in pond micro life.</p>	<p>Dr Chris Thomas</p> 
	<p>DNA extraction</p> <p>Learn about cells and the information stored in the Nucleus. Pupils put on their white coats to join the scientists from NAPP Pharmaceuticals to extract DNA from fruit.</p>	<p>STEM Team East</p> 

	<p>Parasites &amp; Diseases</p> <p>Scientists from the Wellcome Trust Sanger Centre give an introductory talk on parasites and the diseases they can cause. Pupils study and describe different parasites under the microscope including fluke worms, trypanosomes and tapeworm cross sections and make a DNA sequence bracelet.</p>	<p>Welcome Genome Campus</p> 
	<p>Medicine</p> <p>Tablets - smart medicine for everyone. An interactive activity to investigate change in time for which colour remains on a tablet. Try spot-testing to catch the drug cheats.</p>	<p>GlaxoSmithKline</p> 
	<p>Meet The Medics</p> <p>Keeping healthy is important and so it helps to understand how the human body tells us our state of health. Our Medical scientists will show you how to make and record clinical observations.</p>	<p>STEM Team East</p> 
	<p>Medimmune</p> <p>Join the Scientists of Medimmune and AstraZeneca and hear about their research and development into a Flu Antibody. Pupils will make model antibodies and learn about how these support our bodies in the fight against the Flu virus.</p>	<p>Astra Zeneca</p>  <p>A member of the AstraZeneca Group</p>
	<p>Visit the Vets</p> <p>Meet some trainee vets and veterinary nurses to learn about the anatomy of our pets and farm animals. Learn how early scientists such as Darwin used their drawing skills to record scientific information on species and built up the early records. Pupils can try out their drawing and recording skills and learn how to bandage a dog's leg!</p>	<p>University of Cambridge</p> 
	<p>Plant Pathology</p> <p>We're hoping to have a new workshop from plant pathologist Denise Elliott of NIAB. Learn how to set up your own plant and environment space at your school by designing your model with the experts</p>	<p>NIAB</p>  <p>National Institute of Agricultural Botany</p>