



Education Programme Curriculum Links

Workshops

Bridge Building Challenge:

Our bridge building workshop encourages problem-solving, creativity and teamwork, whilst introducing basic engineering concepts to the pupils in an engaging and hands-on way.

Key Stage 1	Key Stage 2
Science and DT: • Knowledge, understanding and skills to engage in an iterative process of design and making. (S) • Design purposeful, functional, appealing products for themselves and other users based on design criteria (DT) • Generate and develop ideas through drawing, talking, mock-ups and ICT. (DT) • Building structures – exploring how they can be stiffer, stronger and more stable (DT) • Distinguish between an object and the material from which it is made (S) • Identify and name a variety of everyday materials (S) • Describe the simple physical properties of a variety of everyday materials (S) • Compare and group together a variety of everyday materials on the basis of their simple physical properties. (S)	Science and DT: • Recognise how secondary sources might help to answer questions that cannot be answered through practical investigations. • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect (S) • Explore falling objects (S) • Apply understanding of how to strengthen, stiffen and reinforce more complex structures (DT) • Understand and use mechanical and electrical systems (DT) • Experience forces that make things begin to move, get faster or slow down (S) • Explore the effect of levers, pulleys and simple machines on movement (S)

• Pupils explore and experiment with a wide range of materials. (S) • Identify and compare suitability of a variety of everyday materials (s) (DT) • Find out how the shapes of solid objects can be changed (S) • Use a range of materials creatively to design and make products (DT) • Generate, develop, model and communicate their ideas through talking, drawing templates, mock-ups and ICT (DT) Art: • Use a range of materials creatively to design and make products. Maths: • Pupils identify, compare and sort shapes on the basis of their properties.	• Compare and group together different types of rock and other materials (S) • Know that some materials will dissolve in liquid to form a solution. (S) • Give reasons based on evidence from comparative and fair tests for the particular uses of everyday materials, including metals, wood and plastic (S) • Learn about great architects (DT) Maths: • Add and subtract numbers mentally. • Knowledge of the properties of shapes.
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Key Stage 3	Key Stage 4
Design and Technology - Identify and solve their own design problems and understand how to reformulate problems given to them. - Select from and use a wider, more complex range of materials, components and ingredients, considering their properties.	AQA Design and Technology: - Develop, communicate, record and justify design ideas. - How to select and use materials and components appropriate to the task. - The importance of planning the cutting and shaping of material to minimise waste. Pearson Edexcel - To apply knowledge and understanding of working properties, characteristics, applications, advantages and disadvantages of types of materials, in order to be able to discriminate between them and select appropriately. - Develop, communicate, record and justify design ideas, applying suitable techniques. - When designing or modifying a product, students should be able to apply their knowledge and understanding of materials, components and manufacturing processes.

Be the Bridge Master:

In this workshop, pupils take on the role of Bridge Master and become responsible for the maintenance of the bridge. They'll be presented with budgeting challenges and will evaluate the pros/cons of projects for all stakeholders.

Key Stage 3	Key Stage 4 + 5
Maths: - Consolidate their numerical and mathematical capability from key stage 2 and extend their understanding of the number system and place value to include decimals, fractions, powers and roots - Select and use appropriate calculation strategies to solve increasingly complex problems - Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems - Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics - Begin to model situations mathematically and express the results using a range of formal mathematical representations - Select appropriate concepts, methods and techniques to apply to unfamiliar and nonroutine problems - Use a calculator and other technologies to calculate results accurately and then interpret them appropriately Design and Technology: - Identify and solve their own design problems and understand how to reformulate problems given to them	Engineering: AQA Curriculum Links - To know the comparative costs of different materials within and across these groups e.g. copper vs gold for use as electrical components or timber vs steel for structural components - Engineered lifespans, planned obsolescence, sealed parts and maintenance requirements - Students will understand the need for maintenance of engineered products to ensure safety in operation and enable efficiency of operation - Students will also understand the reasons for the following types of maintenance work - How user requirements affect material choice and manufacturing process - Solve problems through a logical, systematic approach - Analyse and evaluate existing solutions to problems - Produce a plan considering: materials, processes, time and safety Pearson Edexcel: Level 1/Level 2 Tech Award

- Analyse the work of past and present professionals and others to develop and broaden their understanding

- Develop knowledge and understanding of the engineering industry, the interconnections within engineering sectors, and how these are integrated to enable organisations to find solutions to real-life problems
- Identify an organisation and investigate how it is organised and, the different departments in the organisation and the links between them

Pearson Edexcel: BTEC Higher Nationals in Engineering

- Introduce students to the techniques and best practices required to successfully create and manage an engineering project
- Reflecting on their role in a wider ethical, environmental and sustainability context to start the process of becoming a professional engineer
- Begin to explain quality control processes
- Introduce students to engineering management principles and practices
- Explain management and leadership theories and techniques used within engineering organisations
- Introduce students to the importance of equipment maintenance programmes, the benefits that well-maintained equipment brings to an organisation and the risk factors it faces if maintenance programmes and processes are not considered or implemented

History Detectives:

This workshop combines historical exploration, visual analysis and hands-on writing; it provides pupils with a unique and immersive learning experience on the history of postcards.

Key Stage 1	Key Stage 2
History: • The lives of significant individuals in the past who have contributed to national and international achievements • Significant historical events, people and places in their own locality • How Brunel fits within a chronological framework Local history: • Events beyond living memory that are significant nationally and globally • Significant historical events, people and places in their own locality • The lives of significant individuals in the past who have contributed to national and international achievements Maths: • Sequencing events in chronological order, recognising dates. Art • Learn about a range of artists and designers. • Use drawing, painting and sculpture to develop and share their ideas.	History: • A significant turning point in British History • An aspect in British History that extends pupils' chronological knowledge Local history: • Provides an in-depth study linked to an aspect of local history dating from a period beyond 1066 that is significant in the locality. • A significant turning point in British history. Maths: • Complete duration of events. Art: • Improve their mastery of art and design techniques, learn about great architects. English: • Opportunity to listen to stories, poems and non-fiction.

English • Writing narratives about personal experiences and those of others, writing about real events.	
History workshops will help pupils to understand historical concepts, understand methods of historical enquiry and gain an historical perspective by placing their knowledge of Bristol/Brunel into national and international contexts. They will also aid understanding of how Britain has influenced and been influenced by the wider world.	