DROITWICH SPA HIGH SCHOOL AND SIXTH FORM CENTRE

life. Changing. learning.

GCSE Engineering Year 10

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topics	**Adjustable Mirror** Practical project based around metal machining processes, reading technical drawings, general workshop skills	**Adjustable Mirror** Practical project based around metal machining processes, reading technical drawings, general workshop skills	**CADCAM** Using 2D and 3D CAD programs to operate a laser cutter and a 3D printer	**Electronics** Basic electronics project with programmable elements	**Multi Tool** Short design and make project in preparation for the NEA	**NEA (Non-Exam Assessment)** Manufacturing using polymers and jigs
Assessment	Ongoing formative assessment in lessons Booklet tasks	Assessment of practical skills and H&S knowledge End of project summative assessment	Ongoing formative assessment of CAD tasks	Electronics test	Assessment of engineering skills developed throughout Year 10 End of project summative assessment	End of year written assessment

Building on Prior Learning	Students will use the skills and knowledge developed in Years 8 and 9 as a foundation for a confident and informed approach to their engineering activities.
Links with other subjects	This subject links with Art (sketching and creative skills), Business (income, economy, industry) Science (biomimicry, investigations, properties of materials, energy, forces and electronics – remember technology is the appliance of science!), English (annotation, evaluation, instructional and descriptive language, literacy links, extended writing), Geography (designing solutions to global issues such as climate change, ethical sourcing of materials, energy production), History (industrial revolution, inventions that changed the world), ICT (word processing, research, graphs, data processing, programming and CADCAM – computer aided design and computer aided manufacture), Maths (weights and measures, quantities, costings, graphs, analysis of data, geometry)
Extracurricular opportunities	On Wednesday Evenings students can continue to develop their class projects at our KS4 D&T Club. . On Friday students can spend time in the department making products for the Duke of Edinburgh Award skills component. Appropriate school trips to manufacturing companies will be offered. Each year we run a visit to Jaguar Land Rover. Arkwright Scholarship: DSHS have had 6 Arkwright Scholars over the past 5 years. Prospective Year 10 candidates meet every fortnight to create an engineering or design project and prepare for the Arkwright aptitude test.
A successful learner in this subject will demonstrate	Students deploy design skills and technical problem solving to address and solve practical problems When making a successful learner will be able to assemble, make and finish demanding products, demonstrating skills in using a wide variety of equipment and materials including CAM as well as applying quality control during manufacture. In evaluating designs and final products, a successful learner will use a range of appropriate testing techniques to ascertain the commercial viability of the design. Technical knowledge will be in evidence throughout the other three strands and the student should be able to prepare detailed instructions that could be used by a third party to manufacture a design.
Impact on personal development	Engineering opens up a wide range of opportunities to explore a range of issues from the world around us. Students are encouraged to work together to complete their projects and to share resources. Engineering is an increasingly innovative and exciting area to work in. It affects every aspect of modern life – from skyscrapers to smart phones, cars to carrier bags. They will gain practical skills and understanding to inspire a lifelong interest in engineering. It will help students who enjoy being creative, with an affinity for drawing, design, maths and problem-solving.

Ways to support student learning in this subject

- Students are encouraged to continue their studies outside of the classroom. Trips to interactive museums (e.g THINK Tank, National Transport Museum in Gaydon, V&A, Ironbridge, Science Museum, RAF Cosford) can inspire the budding designers, inventors and engineers of tomorrow.
- Students are encouraged to keep sketch books, take photographs and collect examples of innovative and creative designs.
- There are many free software programs that students can download or access online to develop their CADCAM skills. These include Sketchup, Autodesk Fusion 360, Autodesk Inventor and Blender. Many students have designed products at home and then had them manufactured on the school's 3D Printer.
- Look out for any design and creative competitions on TV, radio, or in the newspaper – these can be a fantastic way to get excited about designing and creating! Several DSHS students have found success in competitions, winning prizes and enhancing career prospects.
- Programs like 'How It's Made?' and 'The Gadget Show' introduce students to a range of innovative products and improve their understanding of how our world is made.
- Students are encouraged to read books, magazines (Wired) and articles about design and innovative products on-line (Dezeen, Design Boom, Interesting Engineering)
- When completing homework tasks 'go the extra mile' and thoroughly research the topic areas, practice making models in 3D from resources found at home including card and Lego.
- Students are encouraged to enjoy and have fun in Design and Technology
- Students should be encouraged to make mistakes and learn from them.