Curriculum Overview 2023-24: Design and Technology – Resistant Materials Technology: GCSE Ed-Excel

Year Group 7 Resistant Materials	**Autumn Term / Spring Term / Summer Term** **Mechanical Toy Project**: During a 9-week project the pupils learn how to use a range of tools and equipment, such as tenon saw, bench hook and bench drills to make a mechanical toy. The students learn fundamental skills such as learning where materials come from to making wooden joints using only hand tools. This initially prepares them for the following year where they apply their knowledge from this project and advance, moving forward. In addition, students learn about motions and movements, alongside mechanisms called CAM's.			**Useful information / websites** www.technologystudent.com www.BBCbitesize.com www.designtechnology.info/home
Year Group 8 Systems and Control	**Autumn Term / Spring Term / Summer Term** **Electronic Cyber-pet:** During this 9-week project the pupils are introduced to systems and control, where they build an electronic cyber-pet. The use a PCB (printed circuit board) as a basis. They are then introduced to soldering, where they begin soldering components into the PCB. Students learn about control systems, input process and output and calculating resistors, using Ohm's law. Students are further introduced to designing, where they have the opportunity to design their own character for their cyber-pet, used acrylic or corrugated cardboard. This project is based on pupils being independent and showing their creativity, through designing and making, but also developing cross curricular, life skills.			**Useful information / websites** www.technologystudent.com www.BBCbitesize.com www.designtechnology.info/home
Year Group	**Autumn Term**	**Spring Term**	**Summer Term**	**Useful information / websites**
Year 9 Materials Technology	Development of basic drawing skills needed for non-examined assessment Understanding the different categories of wood, metal and plastic • Isometric projection • Orthographic projection	Design and make a metal, balancing toy, with a unique design. • Design development • Working with various metals • Brazing • Riveting	Design and make a small, wooden storage box incorporating various wooden joints • Research into wooden joints and their mechanical properties	www.technologystudent.com www.BBCbitesize.com www.designtechnology.info/home www.design-technology.org www.mr-dt.com

	• Zoom in/technical features • Wood – ferrous / non-ferrous • Thermoplastic/Thermoset • Hardwood/ Softwood / Man-made board	• Joining using industrial processes • Use of CAD/CAM • Sustainability and eco-friendly use of materials	• Wooden joints covered; Dowel, finger/comb, dovetail, butt and cross halving. • Fixtures and fittings – permanent and semi-permanent • Finishing techniques – wax, paint and varnish. • CAD/CAM design for lid/cover **Understand and make an Electronic Cyber pet.** • Electronics project including; Resistors, LED's, Input – process – output, LDR's, PicAxe programming /	www.edexcel.com/designandtechnology.com

			computer programming	
Year 10 Materials Technology	Design and Technology core content: Learning key areas that are required for the GCSE exam and the non-examined assessment (project). • The impact of new and emerging technologies • How the critical evaluation of new and emerging technologies informs design decisions; considering contemporary and potential future scenarios from different perspectives, such as ethics and the environment • How energy is generated and stored in order to choose and use appropriate sources to make products and power systems • Developments in modern and smart materials, composite materials and technical textiles	Core content is continued thorough the spring term. • The functions of mechanical devices used to produce different sorts of movements, including the changing of magnitude and the direction of forces • How electronic systems provide functionality to products and processes, including sensors and control devices to respond to a variety of	Core content is continued through the summer term. • The categorisation of the types, properties and structure of papers and boards • The categorisation of the types, properties and structure of thermoforming and thermosetting polymers • 2 The categorisation of the types, properties and structure of natural and manufactured timbers • Investigate and analyse the	www.technologystudent.com www.BBCbitesize.com www.designtechnology.info/home www.design-technology.org www.mr-dt.com www.edexcel.com/designandtechnology.com

		inputs, and devices to produce a range of outputs • The use of programmable components to embed functionality into products in order to enhance and customise their operation • The categorisation of the types, properties and structure of ferrous and non-ferrous metals **Mini GCSE Project based on a theme similar to current Year 11 contextual challenge** • Design process • Design & Make	work of past and present professionals and companies in order to inform design 1St June – GCSE begins, with contextual challenges released and students begin to select their preferred challenge to design and make. This leads into the Year 11 NEA.	

		• Modelling research, investigate, primary and secondary research.		
Year 11 Materials Technology	**Design & make project – 50% of qualification.** Students pick a contextual challenge provided by the exam board. Students will produce a project, based on their specialism, which consists of a portfolio and prototype. Part 1 – Investigate Part 2 – Design Part 3- Make Part 4 - Evaluate	Design & Make project completed, moderated and submitted. Revision on core content is revisited from year 10. Revision is more focused on exam style questions.	**Examination – 50% of qualification.** Core content is revisited and implemented into the teaching. Subject specific content is covered for the exam. **Section A**: Core This section is 40 marks and contains a mixture of different question styles, including open-response, graphical, calculation and extended-open-response questions. There will be 10 marks of calculation questions in Section A. **Section B**: Material categories This section is 60 marks and contains a mixture of different question styles, including open-response, graphical, calculation and	www.technologystudent.com www.BBCbitesize.com www.designtechnology.info/home www.design-technology.org www.mr-dt.com www.edexcel.com/designandtechnology.com

			extended-open-response questions. There will be 5 marks of calculation questions in Section B	