Year 10 Design and Technology Sequence

DEYES HIGH SCHOOL
LYDIATE LEARNING TRUST

	Content Taught	National Curriculum	Essential Knowledge	Assessment	Rationale
HT1	**During this half term students study a sequence of lessons developing essential knowledge of:** **New and emerging technologies** Industry and enterprise Sustainability and the environment People, culture and society Production techniques and systems Informing design decisions	3.1.1	Students must know and understand the impact of new and emerging technologies on contemporary and potential future scenarios in relation to the following areas: design and organisation of the workplace including automation and the use of robotics Crowd funding Finite & Non Finite resources Continuous improvement Automation 'Bringing it all together' tasks are frequent throughout this topic/unit to allow students to bring essential	Assessments are cumulative and students are tested on previous topics taught alongside new materials and content to ensure knowledge recall is effective. End of unit tests (Cumulative) Formative assessment is used throughout the topics both practically and in terms of theoretical knowledge, to assist student development significantly.	This series of lessons builds on the essential knowledge delivered at KS3 such as production techniques, but also introduces students to New and emerging technologies, significantly deepening and widening student knowledge in those topics. This will allow students to take the information learnt and then be applied to a range of subjects throughout the course and beyond, as the essential knowledge underpins many future topics.

			knowledge together and apply it appropriately **Essential knowledge reading for breadth** Industry	Assessments are cumulative and students are tested on previous topics taught alongside new materials and content to ensure knowledge recall is effective. End of unit tests (Cumulative) Formative assessment is used throughout the topics both practically and in terms of theoretical knowledge, to assist student development significantly.	This series of lessons on Energy Generation and Storage, builds on the essential knowledge delivered at KS3 such as Energy generation, Energy storage and Mechanical devices, providing more depth and breadth but allowing rapid progress because of the previous work in KS3. New Areas such as Smart & Modern Materials and systems designing, and processing will allow students to incorporate this knowledge into other design challenges later on and also gives students a wider understanding of current uses.
HT2	**Energy generation and storage** Energy generation Energy storage Modern materials Smart materials Composite materials Systems approach to designing Electronic systems processing Mechanical Devices	3.1.2 3.1.3 3.1.4 3.1.5 3.1.6	Power generation Coal Gas Oil Nuclear Renewable energy Developments made through the invention of new or improved processes. First order second order third order. Linkages: bell cranks push/pull. Rotary systems: CAMs and followers simple gear trains pulleys and belts		

	Materials and their working properties Paper & Boards Natural & Manufactured Timbers Metals & Alloys Polymers Textiles		'Bringing it all together' tasks are frequent throughout this topic/unit to allow students to bring essential knowledge together and apply it appropriately **Essential knowledge reading for depth** Electricity generation	Assessments are cumulative and students are tested on previous topics taught alongside new materials and content to ensure knowledge recall is effective. End of unit tests (Cumulative) Formative assessment is used throughout the topics both practically and in terms of theoretical knowledge, to assist student development significantly.	This series of lessons in Materials and their working properties, significantly builds on the essential knowledge delivered at KS3, in terms of both breadth and depth. it will allow students to incorporate a range of materials into many future applications with a greater security of knowledge in terms of industrial techniques. This series of lessons on Common specialist principals, builds on the essential knowledge delivered at KS3 such as Ecology and social footprint and forces and stresses, allowing rapid progress in terms of breadth and depth of knowledge. It allows areas such as improving functionality to be taken forward into successful design and redesign
HT3	**Common Specialist Principals** Forces & Stresses Improving functionality Ecology and social footprint The six R's Scales of production	3.2.1 3.2.2 3.2.3 3.2.4 3.2.5	In addition to the core technical principles, all students should develop an in-depth knowledge and understanding of the following specialist technical principles: • selection of materials or components • forces and stresses • ecological and social footprint • sources and origins		

		3.2.6	• using and working with materials • stock forms, types and sizes • scales of production • specialist techniques and processes • surface treatments and finishes. 'Bringing it all together' tasks are frequent throughout this topic/unit to allow students to bring essential knowledge together and apply it appropriately **Essential knowledge reading for consolidation** The 6R's	Assessments are cumulative and students are tested on previous topics taught alongside new materials and content to ensure knowledge recall is effective. End of unit tests (Cumulative) Formative assessment is used throughout the topics both practically and in terms of theoretical knowledge, to assist student development significantly.	challenges, as students have the knowledge required to apply key principals creatively and successfully. Scales of production give students new knowledge to the quantities required in mass production techniques. This allows more accurate selection of manufacturing types for the quantity required, in future projects.
HT4	**Timber** Sources Origins & Properties Working with Timber based materials Commercial manufacturing, surface treatments and finishes **Metal** Sources Origins & Properties	3.2.4 3.2.5 3.2.6 3.2.4	In relation to at least one material category, students should know and understand the sources and origins of materials.		The Material selection covered in this series of lessons directly links to the work covered in KS3, it adds breadth and depth through industrial techniques and commercial surface treatments and finishes. This allows

	Working with Metal based material and fixings. Commercial manufacturing, surface treatments and finishes **Polymers** Sources Origins & Properties Working with Polymer based materials and fixings Commercial manufacturing, surface treatments and finishes	3.2.5 3.2.6	Students must know and understand the physical and mechanical properties relevant to commercial products in their chosen area. 'Bringing it all together' tasks are frequent throughout this topic/unit to allow students to bring essential knowledge together and apply it appropriately **Essential knowledge reading for consolidation** Timbers Metals Polymers	Assessments are cumulative and students are tested on previous topics taught alongside new materials and content to ensure knowledge recall is effective. End of unit tests (Cumulative) Formative assessment is used throughout the topics both practically and in terms of theoretical knowledge, to assist student development significantly.	students to have a full understanding when it comes to material selection, manufacturing processes and types of finish, essential to a successful outcome when completing future design and make challenges.
HT5	**Stock forms, types and sizes** **3.2.7 Scales of production** **Specialist techniques and processes** **Surface treatments and finishes**	3.2.6 3.2.7 3.2.8 3.2.9	In relation to at least one material category or system, students should know and understand the different stock forms types and sizes in order to calculate and		

			determine the quantity of materials or components required. **Essential knowledge reading for breadth** Scale of production		
HT6	**Designing Principals** Investigation Primary & secondary data Environmental social and economic challenge The work of others Design Strategies Communication of design ideas **Making Principals** Prototype development Selection of materials & components Tolerances & allowances Material management and marking out Specialist tools, equipment techniques and processes Surface treatments and finishes	3.3 3.3.1 3.3.2 3.3.3 3.3.4 3.3.5 3.3.6 3.3.7 3.3.8 3.3.9 3.3.10 3.3.11	investigation, primary and secondary data • environmental, social and economic challenge • the work of others • design strategies • communication of design ideas • prototype development Appropriate materials and components to make a prototype. How to select and use materials and components appropriate to the task considering: • functional need • cost • availability 'Bringing it all together' tasks are frequent throughout this topic/unit to allow students to bring essential knowledge together	Assessments are cumulative and students are tested on previous topics taught alongside new materials and content to ensure knowledge recall is effective. End of unit tests (Cumulative) Formative assessment is used throughout the topics both practically and in terms of theoretical knowledge, to assist student development significantly.	This series of lessons covers the stock forms that materials can be purchased in. This builds on the prior materials knowledge and adds another element of student understanding, enabling them to have a complete understanding of material purchase types for use on future projects. This series of lessons encapsulates many of the topics previously covered in KS3 & KS4, with the intention of bringing knowledge together and preparing students for future design and make challenges. Students will have a raft of both essential knowledge and disciplinary knowledge to draw upon as they move into year 11.

			and apply it appropriately **Essential knowledge reading for depth** Prototypes		