DT Unit Overview Year 9

Intent:

Intent of D&T is to be a thriving, inspirational and practical subject which produces students who explore their creativity, embrace challenge and achieve their best whilst considering the needs, wants and values of others and the wider world. Students acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. They learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world.

- Develop their creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world.
- Build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users.
- Critique, evaluate and test their ideas and products and the work of others.
- Provide suitable problems or themes to work from.
- Develop understanding and skills how sources, experiments and investigations can be used to inform ideas.
- Develop skills to use specialist materials, tools, techniques and machinery safely.
- Develop understanding of the importance of selecting sources, methods and techniques suitable to intentions.
- Develop their skills and understanding of technological developments such as CAD and CAM.
- Build an understanding how the subject plays a vital part of STEM by developing skills to think ad intervene creatively to improve quality of life.

Implementation:

Students from all year groups are given the opportunity to extend their current D&T experience by exploring and experimenting with a wider range of techniques and equipment in a safe and relaxing environment. Attendance to extra curriculum club has increased steadily in numbers, especially attendance by the younger students in the school.

Work produced during these lunchtime clubs are often used and displayed within the school to celebrate success and inspire others.

Impact:

Students in Y10 and 11 follow the AQA GCSE Design and Technology course. The exam boards 3 assessment objectives (Identify, investigate & outline design possibilities; Design & make prototypes that are fit for purpose; Analyse & evaluate) and taxonomy for assessment are used to assess students and measure progress.

From Y7 students Schemes of works are planned to develop students' knowledge and skills by having appropriate coverage of content for the year group which are structured and sequenced to build the knowledge of topics and skills in layers.

By the time students reach Y10 they will have experienced a broad enough D&T curriculum to work with some confidence and independence. Students will have evaluated their progress and knowledge, they will be able to select their favourite methods, materials and approaches.

We encourage all students in KS4 to consider DT/Engineering futures. We offer specific careers information through displays and discussion. SOL have been developed in GCSE DT and Construction that focus on post 16 options.

Students in KS4 are actively encouraged to consider further study at BSF – A level DT -Product Design. At KS5 students deepen their knowledge gained at KS4 and have the opportunity to become creative, independent learners. KS5 classes are a visible asset to the department. They are our key role models for younger years. Many past students have successfully completed the A level course and progressed to STEM careers or higher education

Product Design – Unit 1 Sweet Dispenser				
What are we learning?	**Our intention - What knowledge, understanding and skills will we gain?**	**Evaluation and assessment methods**	**Implementation**	**What additional resources are available?**

Designing - Understanding contexts, users and purposes	**Knowledge –** Exploring context, consideration of social, moral, cultural issues of intended users, design brief, design specification. **Understanding –** Students work confidently with the given context in order to reformulate and develop their design brief and specification. Students understand the needs of the user through the research they conduct. **Skills –** Writing a design brief and specification. Communication, comprehension, time management.	Detailed research that fully comprehend the design context. Social, moral and cultural issues are identified as well as the health and well being. Detailed design brief with clear intention Detailed specification that reflects the research undertaken.	In Y7 and 8 students work with given design brief. They then learn how to structure their own.	Exemplar work
Design: Generating, developing, modelling and communicating ideas Evaluating: Key Individuals Evaluating: Own Ideas	**Knowledge –** Using specifications to inform design. Iterative Design process. Biomimicry. Modelling. CAD CAM 2D Design Review on CAD and use of 2D Design Software **Understanding –** Students can develop design work using an iterative cycle to avoid fixation. Students look at biomimicry as a design strategy to support this. Students understand the iterative process; producing 3D models in a range of materials to further develop and communicate their ideas. Students use CAD to model and validate their designs in advance of manufacture. Students can recall other examples of biomimicry. Ideas are evaluated against the specification. **Skills –** Develop sketching skills. Communicating design ideas. Review on previous design strategies and introduction to new strategy; biomimicry to generate ideas.	Reflecting influence from the work of others in learners own design work. Neatly presented design ideas with biomimicry influence Concept modelling from paper to MDF Clear development showing the iterative process Excellent communication of design thinking	Iterative design process is introduced in Y8. Students design and model ideas from the KS2 curriculum.	Resource kits, modelled examples on SOL PPT.

Evaluating: Existing Products	**Knowledge –** Existing product analysis. WAGOLL. Product disassembly **Understanding –** Products are analysed to determine how they are constructed and function. How products are developed. **Skills –** Communicating findings clearly. Communication and written skills. Review on how to analyse products.	Detailed EPA which suggest materials and manufacturing methods used along with suggested improvements.	Some EPA completed in Y7 and Y8. Students focus on the advantages and disadvantages of the products rather than how they are assembled.	Exemplar work
Technical Knowledge: Classifying timbers	**Knowledge –** Hardwoods, Softwoods and Manmade boards Material area will be introduced here instead of Y8 due to Covid 19. **Understanding –** Students can classify and explain the properties and physical properties of timbers and boards. Students can discuss the most appropriate types for their project. **Skills –** Identifying types of timber and boards for their design.	Students can justify selection of timber and board type. Students can explain the advantages and disadvantages of timbers and boards	Y8 Sweet Dispenser	Quiz

Making	**Knowledge –** Hardwoods, Softwoods and Manmade boards how they can be cut and joined. **Understanding –** Use of basic hand tools to measure, mark-out and cut timbers. Use on workshop machinery. **Skills –** Develop fine motor skills to cut timbers accurately.	A high-quality finished product is achieved.	Build on skills learnt in Year 7 and 8.	In lesson demonstration.

Product Design – Unit 2 Money Box				
What are we learning?	**Our intention - What knowledge, understanding and skills will we gain?**	**Evaluation and assessment methods**	**Implementation**	**What additional resources are available?**

Designing - Understanding contexts, users and purposes	**Knowledge –** Exploring context, consideration of social, moral, cultural issues of intended users, design brief, design specification. **Understanding –** Students work confidently with the given context to reformulate and develop their design brief and specification. Students understand the needs of the user through the research they conduct. **Skills –** Writing a design brief and specification. Communication, comprehension, time management.	Detailed research that fully comprehend the design context. Social, moral and cultural issues are identified as well as the health and well being. Detailed design brief with clear intention, detailed specification that reflects the research undertaken.	Builds on the detail shown in the previous year 9 project – Sweet Dispenser.	SOL PPT.
Design: Generating, developing, modelling and communicating ideas (CADCAM)	**Knowledge** - modelling methods. Use of ICT. Size and measurements. **Understanding** - use models. Introduction to CAD and 2D Design. **Skills** - Modelling and developing idea through card modelling. Using dimension tools to create accurate moulds using *TechSoft Design*. Review on testing ideas using a new material area. Developing CAD skills using 3D CAD, *SolidWorks*. Assembling parts in *SolidWorks*.	CAD CAM files produced with no errors. Correct size and key features are correctly placed.	This builds on the detailed CADCAM work in year 8 – Slot Lamp Project.	CAD how to guides. SOL PPT.

Planning	**Knowledge –** Planning for manufacturing. Why planning is important. Planning tools **Understanding –** Students make simple use of planning tools, for instance Gant charts to communicate their plans clearly. They match and select suitable materials considering their fitness for purpose. **Skills –** Time management, organisation recalling names of tools, techniques, specialist terminology.	Students select appropriately from a wide range of materials and equipment and machinery. Plan or Gannt chart is communicated clearly so that others could implement them. Students work from their own plan during practical lessons demonstrating independence and adhering to H+S.	Students are used to planning for manufacture. AS students progress into KS4 it becomes more significant.	Exemplar work in SOL PPT.
Making	**Knowledge –** Hardwoods, Softwoods and Manmade boards how they can be cut and joined. Traditional wood joints – The role of the carpenter (Construction) **Understanding –** Use of basic hand tools to measure, mark-out and cut timbers. Use on workshop machinery. The need for accuracy. **Skills –** Develop fine motor skills to cut and join timbers accurately.	A high-quality finished product is achieved. All wood joints are accurate and fit well.	Build on skills in previous project – Sweet Dispenser.	In lesson demonstration SOL PPT.