



Curriculum Intent

Year 9 Design & Technology



PRIORITIES IN WHOLE SCHOOL CURRICULUM INTENT

- Enjoyment of learning
- Knowledge acquisition and recall
- Extensive vocabulary
- Effective communication through writing, speaking & listening, and use of technology
- Numeracy
- Critical evaluation of information
- Enterprise and problem-solving
- Working with others
- Practical skills

KEY QUESTIONS TO CONSIDER

1. Why has content been selected? Is there sufficient focus on the most powerful knowledge, concepts, and skills?

Content about woods and plastics has been selected to provide essential knowledge about material properties, applications, and sustainability. This focus equips students with critical skills needed for informed design decisions.

2. Does learning provide sufficient challenge? Is there sufficient challenge for all learners in all year groups?

Learning activities are designed to be differentiated, allowing for varying levels of complexity based on student ability. This ensures that all learners are appropriately challenged, from foundational skills to advanced applications.

3. Why is learning sequenced in this way? Does the sequence enable students to build on prior learning and learn in increasing breadth and depth over time?

The learning sequence starts with fundamental material properties and progresses to complex applications, allowing students to build on prior knowledge. This cumulative approach enhances understanding and retention as students advance.

4. How is learning sequenced or spaced to promote long-term memory?

Learning is spaced with repetition of key concepts and reinforced through hands-on projects that encourage active engagement. Opportunities for reflection and evaluation further support long-term retention of knowledge.

SUBJECT CURRICULUM INTENT

Design and Technology (D&T) is an inspiring, rigorous, and practical subject that equips young people with the skills and knowledge necessary for success in the world of design and industry. The intent of the curriculum, particularly in the context of making, is to provide students with a comprehensive learning experience that encompasses both creative design and practical application.

Students will develop a wide range of practical skills, including woodworking techniques, tool safety, and precision measurement. These foundational skills are essential for crafting a high-quality model vehicle.

The curriculum will cover various manufacturing methods, from traditional handcrafting techniques to modern approaches utilising CNC machines. This exposure helps students appreciate the evolution of manufacturing and its impact on design. By leveraging advanced resources like laser cutters, students will learn how technology can enhance the design process. They will gain hands-on experience with virtual modelling and digital fabrication, preparing them for future careers in design and engineering. Students will engage in the design process, starting with brainstorming and sketching ideas. This iterative approach encourages critical thinking and problem-solving as they refine their designs based on functionality and aesthetics. Throughout the project, students will be encouraged to make value judgments regarding aesthetic, economic, moral, social, and technical aspects of their designs. They will learn to evaluate their own work and that of their peers, fostering a culture of constructive feedback and continuous improvement.

Discussions on material choices and their environmental impact will be integrated into the curriculum. Students will learn the importance of sustainability in design, considering how their choices affect the environment and society. The project encourages students to express their creativity through unique design choices and personalised features. This focus on innovation fosters a sense of ownership and pride in their work. Group activities and peer reviews will promote collaboration among students, enhancing their communication skills and ability to work effectively in teams. These skills are vital in the design industry, where collaboration is often key to successful outcomes. The intent of the Design Technology curriculum, particularly through the project of making, is to prepare students for the dynamic world of design and industry. By combining practical skills with technological advancements and critical thinking, the curriculum aims to develop well-rounded individuals who are capable of innovating and making responsible design choices in their future careers.

PDE Links

- What is the impact of human activity?
- What is the impact of modern lifestyle on the planet?

Essential knowledge

- Students will need to be able to identify the different materials used and their properties.
- What is the difference between the different categories of materials; plastic (thermo forming, thermosetting) woods (Softwoods, Hardwoods and Manufactured boards)
- Be able to identify the different processes CAD and CAM
- Students will be able to identify the different join techniques (permanent and semi-permanent)
- Identify the different manufacturing processes (One off, batch and mass)

Essential Skills

- Student will be able to cut and shape a variety of different materials using a range of tools and machines.
- They will be able to glue and clamp their work together to laminate the wood together.
- Student will be able to file and round edges of their work using a variety of shaping tools. (files, rasp, sanding machine)
- Students will be able to measure and mark effectively using a rule and marking tools (Tri square)
- Designing using a range of different software (CAD) (Google Sketch Up, 2D Design)

YEAR 9				
KNOWLEDGE	KEY CONCEPTS	SKILLS	RATIONALE	FUTURE DEVELOPMENT
<p>Phone Stand</p> <p>Students will learn about different types of materials and the different properties. Thermo plastic and thermosetting plastics. Students will learn about the difference between the two types of materials. Thermo plastics can be reheated and reshaped were thermo setting plastics set once cold and cannot be reheated. Students will learn about different types of wood, where they are sourced from as well as the different properties and cost. Student will lean about the tools and their specific uses and names, they should also learn key terminology link to these tools i.e. marking datum lines and perpendicular lines using a Tri square. Students will learn about CAD / CAM process including the knowledge they need to use 2D Design. They will learn about industrial processes using a vinyl cutter and apply this in their own work. They should learn about user focused design. Students will learn about laminating and edging materials, student should learn why we undertake this process and how it is used in industry and affects their everyday lives. Students will learn about the different joining techniques and should understand the differences between semi-permanent and permanent fixings for example Screws are semi-permanent as they can be removed, gules / nails are permanent. Students should understand about aesthetics and choose colours, design and patterns to suit their user.</p>	<p>Design</p> <p>User-centred design</p> <p>Communication of ideas</p> <p>Make</p> <p>Sources and origins</p> <p>Stock forms, types and sizes</p> <p>Cut materials efficiently to minimise waste.</p> <p>how to shape and form using abrasion, cutting and addition</p> <p>Tolerance</p> <p>Quality Control (QC)</p> <p>Specialist tools and equipment</p> <p>Evaluate</p> <p>Testing</p> <p>Technical knowledge</p> <p>Commercial processes</p> <p>Materials and their working properties</p> <p>Material categories</p> <p>Key names of materials and their properties</p>	<p>Cutting skills- Tenon saw Plotter cutter (CAD) Drilling- Forstner bit Shaping skills- Joining material Line bending Jack plane Files Chisellin Sanding machine</p> <p>Marking out- using a range of tools- Tri Square Rule Pencil</p> <p>Literacy- Writing, evaluating, methodology, fact sheets.</p> <p>Maths- Measurements</p> <p>Be able to use the different tools used for measuring and marking out.</p> <p>Utilise the different methods for economically marking out on materials and be able to economically mark out using the correct tools on the pieces of material.</p> <p>Students will have the skills to utilise the tools and techniques needed to measure and mark out to minimise wastage of the materials.</p> <p>Be able to make choices about the finishes that need to be applied to their personal valet design and apply them to enhance the functional and aesthetic properties.</p> <p>Students will have the ability to create a final design using 3D CAD (Google SketchUp)</p> <p>Students will have the skill for creating a set of initial design ideas by using the iterative design process. Have the skills to produce exploded/parts drawings to help with the designing.</p> <p>Students will use a range of joining skills, nails, screws, gluing</p>	<p>Students will develop new sets skills and build upon knowledge from previous years. Students will use materials in new ways developing their understanding of the properties of these materials, students will bend and shape plastic using heat this will help them understand the difference between thermo forming plastics and thermo setting plastics and how this has an impact on society. This will also develop their knowledge of the working world and show how products can have an impact on their daily lives for example where are these plastics used and why, also how do they impact on our environment and are they ethical. Students will also learn about laminating materials together (gluing wood) this will help students to understand about the different stock forms that materials come in, this will help develop students' knowledge of the manufacturing process involved in changing stock into products we use in our daily lives. Students will develop their skills using a wide range of practical skills, working on harder techniques and enhancing students' skills in attempt to push them to the extent of their capabilities. Students will work on CAD software (2D Design and Google Sketch up) to help them understand about industry and the working world, this will help them understand the design process more clearly and show them parts of the iteration design process. Students will also focus on user-centred design developing and understanding of the importance of designing for different markets. Student will use a range of joining techniques to help them make informed decision in the future to which the appropriate technique is.</p>	<p>Introducing technical drawing.</p> <p>Cultural design work</p> <p>Reduce task</p> <p>Reading and extracting information from the textbooks</p>

	<p>students will learn about the different surface treatments and finishes that can be applied to timbers</p> <p>Understand what a Prototypes/ one off products</p> <p>Understand what kinds of products are manufactured using mass production.</p> <p>Understand what kinds of products are manufactured using batch production.</p> <p>Prototypes/ one off products</p> <p>Understand what kinds of production are manufactured using continuous production.</p> <p>Understand why 3D CAD is a powerful tool in communicating a design to the client.</p>				
	<p>Train</p> <p>Students will extend their knowledge of the different types of joining techniques we can use for example dowel joints, nails.</p> <p>They will learn how, why and where we use these different joining Student will gain an understanding of how we join different types of materials together. Students will learn how to adjust a drill and insert different drill bits.</p>	<p>Design</p> <p>Communication of ideas CAD</p> <p>Make</p> <p>Sources and origins</p> <p>Stock forms, types and sizes</p> <p>Cut materials efficiently to minimise waste.</p> <p>how to shape and form using abrasion, cutting and addition</p> <p>Tolerance</p> <p>Quality Control (QC)</p> <p>Specialist tools and equipment</p> <p>Evaluate</p> <p>Testing</p> <p>Technical knowledge</p> <p>Commercial processes</p> <p>Materials and their working properties</p> <p>Material categories</p> <p>Key names of materials and their properties</p>	<p>Cutting skills- Tenon saw Plotter cutter (CAD) Drilling- Forstner bit Shaping skills- Joining material Line bending Jack plane Files Chisellin Sanding machine</p> <p>Marking out- using a range of tools- Tri Square Rule Pencil</p> <p>Literacy- Writing, evaluating, methodology, fact sheets.</p> <p>Marking out- using a range of tools- Tri Square Rule Pencil</p> <p>Literacy- Writing, evaluating, methodology, fact sheets.</p> <p>Maths- Measurements</p> <p>Student will use different drill bits to complete different task.</p> <p>Soldering</p> <p>Students will use a range of joining skills, nails, screws, gluing they will need to choose the appropriate technique as part of the construction.</p>	<p>Students will be working on more complicated skills and constructions they will develop their construction cutting and manufacturing techniques using a wider range of tools to create more complex prototypes and to improve their independence when using the equipment.</p>	<p>Introducing technical drawing.</p> <p>More time dedicated to inputs and outputs.</p> <p>Develop homework's to test students understanding</p>

	<p>Student will learn about adjusting the drill and setting the torque.</p> <p>Students will learn about the different types of drill bit in order to understand the different uses.</p>				
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