Curriculum Intent
Subject …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?
2. Does learning provide sufficient challenge? Is there sufficient challenge for all learners in all year groups?
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?
4. How is learning sequenced or spaced to promote long-term memory?

SUBJECT CURRICULUM INTENT

Design and Technology (D&T) is the inspiring, rigorous and practical subject which prepares all young people to live and work in the world of designing and industry. Design and technology build on the skills and knowledge that students will need when entering the working environment and leverages increasingly sophisticated resources like 3D printer and laser cutters to keep up with the ever-evolving industry and practices. Design and Technology provides opportunities to learn about manufacturing and advancements in new technology, using a wide variety of skills from using hand tools to developing their understanding of virtual modeling and the use of sophisticated CNC machines. Additionally, it provides excellent opportunities for students to develop and apply value judgments of an aesthetic, economic, moral, social, and technical nature both in their own designing and when evaluating the work of others.

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)
- Students will be able to solder their circuit boards
- Programming circuits using symbolic programming

	YEAR 9				
	KNOWLEDGE	**KEY CONCEPTS**	**SKILLS**	**RATIONALE**	**FUTURE DEVELOPMENT**
Term 1	**Phone Stand** 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.	**Design** User-centred design Communication of ideas **Make** Sources and origins Stock forms, types and sizes Cut materials efficiently to minimise waste. how to shape and form using abrasion, cutting and addition Tolerance Quality Control (QC) Specialist tools and equipment **Evaluate** Testing **Technical knowledge** Commercial processes Materials and their working properties Material categories Key names of materials and their properties	Cutting skills- Tenon saw Plotter cutter (CAD) Drilling- Forstner bit Shaping skills- Joining material Line bending Jack plane Files Chiselling Sanding machine Bobbin sander Marking out- using a range of tools- Tri Square Rule Pencil Literacy- Writing, evaluating, methodology, fact sheets. Maths- Measurements Be able to use the different tools used for measuring and marking out. 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. Students will have the skills to utilise the tools and techniques needed to measure and mark out to minimise wastage of the materials. 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. Students will have the ability to create a final design using 3D CAD (Google SketchUp) 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. Students will use a range of joining skills, nails, screws, gluing	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.	Introducing technical drawing. Cultural design work Reduce task Reading and extracting information from the textbooks

	students will learn about the different surface treatments and finishes that can be applied to timbers Understand what a prototype / one off product is. Understand what kinds of products are manufactured using batch production. Understand what kinds of products are manufactured using mass production. Understand what kinds of products are manufactured using continuous production. Understand why 3D CAD is a powerful tool in communicating a design to the client.				
Term 2	**Electronic Train / Money box** Students will extend their knowledge of the different types of joining techniques we can use for example dowel joints, nails. They will learn how, why and where we use these different joining techniques. Students will learn about programming hardware using PIC chips. Students should gain knowledge about how a circuit works. Investigating the different inputs, processes and outputs a circuit can have. Student will gain knowledge about symbolic programming and learn how to upload a program to a circuit. 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.	**Design** Communication of ideas CAD **Make** Soldering Sources and origins Stock forms, types and sizes Cut materials efficiently to minimise waste. how to shape and form using abrasion, cutting and addition Tolerance Quality Control (QC) Specialist tools and equipment **Evaluate** Testing **Technical knowledge** Commercial processes Materials and their working properties Material categories Key names of materials and their properties	Be able to create a cutting list based on sizes and materials choices. Cutting skills- Tenon saw Plotter cutter (CAD) Drilling- Forstner bit Shaping skills- Joining material Line bending Jack plane Files Chiselling Sanding machine Bobbin sander Marking out- using a range of tools- Tri Square Rule Pencil Literacy- Writing, evaluating, methodology, fact sheets. Maths- Measurements Student will use different drill bits to complete different task. Soldering Students will use a range of joining skills, nails, screws, gluing they will need to choose the appropriate technique as part of the construction.	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. Student will be introduced to more complex electronic work, and where this is used in real world terms. They will build their knowledge about inputs and outputs to better understand the electronic devices they use and how they are programmed. They will learn how to program hardware using symbolic programming, they will also be able to rewrite the program and replace it if they require. This will develop their understanding of how circuits and programming help us in our daily lives.	Introducing technical drawing. More time dedicated to inputs and outputs. Develop homework's to test students understanding

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