Wennington Hall School

Design Technology Curriculum Map 2021-22

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Curriculum Mapping 2020 – 2021												
Subject	Autumn				Spring				Summer			
DT	Half Term 1	Skills/Knowledge	Half Term 2	Skills/Knowledge	Half Term 3	Skills/Knowledge	Half Term 4	Skills/Knowledge	Half Term 5	Skills/Knowledge	Half Term 6	Skills/Knowledge
Year 7	**Topic** **Keeping ourselves and others safe within the workshop** Understand the various hazards in a workshop environment, how to keep ourselves and others safe. Classroom based activities followed by workshop sessions **Full half term**	Topic covering the dangers associated with each machine and how to operate them in a safe and responsible way. Each student to experience operating each machine and various activities in the production of a certificate frame to hold 'health and safety certificate awarded at the end of the project, **Knowledge;** Select from and use specialist tools, techniques, processes, equipment and machinery. Tool recognition and use Classification of wood Types of polymers Joining techniques **Skills;** Marking out Cutting Safe and correct use of Pillar drill Sanding machine Line bender Various hand tools assembly Surface preparation and finishing	**Topic** **Woodwork** **Jigsaw project** A design and make activity where students design a toy suitable for a child under 5 **Full half term**	This topic looks at the design process followed by a making activity where the students make a wooden frame and jigsaw pieces. The emphasis on safety and correct use of tools and machinery is reinforced throughout. Students can decide on the finishing of the jigsaw pieces either paint or with suitable images. **Knowledge;** Select from and use specialist tools, techniques, processes, equipment and machinery. Tool recognition Wood classification. Screws/pins Types of polymers Finishing methods **Skills;** Marking out Cutting Safe and correct use of Pillar drill/countersink Pin punch use Sanding machine Scroll saw Various hand tools assembly Surface preparation and finishing	**Topic** **Electronics** **Moisture detector**. An electronic/polymer project where students make a plant moisture detector. **Full half term.**	This topic looks at PCB construction and all the components needed to make a successful moisture detector. Once completed the students will then design and make the housing for the pcb and battery from vacuumed formed plastic. Students will develop an understanding of safe and proper use of soldering irons and the vacuum former. **Knowledge;** Select from and use specialist tools, techniques, processes, equipment and machinery. How to use safely soldering iron/solder. Component recognition and function. Use of 'nets' **Skills;** Soldering Vacuum forming. Hand tools Testing and repair.	**Topic** **Bug Hotel** Mixed material project using wood/polymers and various natural fibres and materials. This topic allows the students to use various woodworking tools and machinery with an emphasis on the skills employed using various machines and hand tools. **Full half term**	This project has also been devised to allow the students to develop and experience the use of the line bender, as well as marking out cutting and the use of various tools /machines. This is an opportunity for reinforcing the metric system and aspects of numeracy as well as the deign process. **Knowledge;** Select from and use specialist tools, techniques, processes, equipment and machinery. Tool recognition and use Classification of wood Types of polymers & Resistant materials. **Skills;** Measuring Marking out Cross halving joint Cutting Safe and correct use of Pillar drill Sanding machine Line bender Various hand tools Surface preparation and finishing.	**Topic** **PS/Xbox Games holder** An acrylic based project where the students design and make a holder for items of choice eg. ps4 games	This topic looks at thermoplastics and thermosetting plastics, how to cut, shape and form using the line bender. The students will look at for the first time the use of templates in manufacture. The students will also look at the impact of plastics on society form manufacture to disposal. **Knowledge;** Select from and use specialist tools, techniques, processes, equipment and machinery. Tool recognition and use Classification of polymers Thermoplastics and thermosetting plastics. **Skills;** Using a template measuring Cutting & shaping plastics Safe and correct use of Pillar drill Sanding machine Line bender Various hand tools Surface preparation and finishing.	**Topic** **wooden storage box** A mainly making activity where the students make a storage box from a single piece of softwood. This is followed by the production of an electronic circuit which will detect anyone opening the box. **Full half term**	The emphasis is around reducing the amount of materials we use, marking out, cutting and assembly. Because the project is predominantly making the students will also be able to demonstrate the correct use of machines and tools and how to keep themselves safe as well as others. Students will record and display subject specific language as we proceed through the project. **Knowledge;** Select from and use specialist tools, techniques, processes, equipment and machinery. Understand how more advanced electrical and electronic systems can be powered and used in their products for example circuits with light as an input and sound as an output. **Skills;** Measuring Marking out Safe and correct use of Pillar drill Sanding machine Soldering. PCB construction.
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Year 8	**Topic** **Keeping ourselves and others safe within the workshop.** Understand the various hazards in a workshop environment, how to keep ourselves and others safe. Classroom based activities followed by workshop sessions. **Full half term**	Topic covering the dangers associated with each machine and how to operate them in a safe and responsible way. Each student to experience operating each machine and various activities and a reinforcement of previous work Additional areas include Scroll saw Soldering **Knowledge;** Select from and use specialist tools, techniques, processes, equipment and machinery Tool recognition and use Classification of wood Types of polymers Joining techniques. **Skills;** Marking out Cutting Safe and correct use of Pillar drill Sanding machine Line bender Various hand tools assembly Surface preparation and finishing.	**Topic** **Bird box.** To design and make a bird box using a suitable softwood. **Full half term**	The students will research bird boxes, before designing and making a suitable product. Each student will follow teacher led demonstrations in the correct and safe use of various tools and machinery. **Knowledge;** Select from and use specialist tools, techniques, processes, equipment and machinery. Classification of timber Recognition of Marking out tools Cutting tools Protection of materials from the weather. **Skills;** Measuring Marking out Cutting Safe and correct use of Pillar drill Use of hole saws Sanding machine Various hand tools Surface preparation and finishing.	**Topic** **Electronics alarm circuit** To follow a practical activity which involves the production of an electronic alarm circuit which can be added to the wooden storage box produced earlier. **Full half term**	The students will build component at time a PCB which will alarm when exposed to light. Apart from developing soldering skills and techniques the students will gain knowledge in the function of each component and how each component fits into the final circuit. **Knowledge;** Understand how more advanced electrical and electronic systems can be powered and used in their products for example circuits with light as an input and sound as an output. **Skills;** Component recognition Soldering. PCB construction.	**Topic** **'Light' Design and make a periscope.** **DT / Science** To make a periscope from resistant materials and explore the characteristics of light. **Full Half Term**	Students need to understand the use of templates within DT and the application of joints rather than pins/screws. O/C Each student to construct and complete the manufacture of the carcass and set the mirrors within the periscope. Each session explores and records the variety of 'subject specific language' **Knowledge;** Understand and use the properties of materials to achieve functioning solutions Reinforce previous work on light Dangers when using machinery, Correct PPE when using machinery. **Skills:** Use of templates Care and accuracy using scissors Band saw glueing Carcass construction Use of cramps Sanding machine Surface preparation Finishing.	**Topic** **Bug Hotel** Mixed material project using wood/polymers and various natural fibres and materials. This topic allows the students to use various woodworking tools and machinery with an emphasis on the skills employed using various machines and hand tools. **Full half term**	As well as marking out cutting and the use of various tools /machines. This is an opportunity for reinforcing the metric system and aspects of numeracy. **Knowledge;** Select from and use specialist tools, techniques, processes, equipment and machinery. Tool recognition and use Classification of wood Types of polymers & Resistant materials. **Skills;** Measuring Marking out Cross halving joint Cutting Safe and correct use of Pillar drill Sanding machine Line bender Various hand tools Surface preparation and finishing.	**Topic** **'forces and spaghetti bridges'** **DT/Science/** This project is a design and make project supporting the science curriculum on 'forces' The students will look at current and past bridge designs as well as look at why brides have failed. **Full half term**	What shapes make the strongest structures and the various types of forces. Students will design and make a bridge from spaghetti, the aim is to build the most efficient bridge, they are then tested to destruction and a calculation produces the most bridge. Students are briefed about the safety considerations around hot glue and scissors. **Knowledge;** Understand and use the properties and performance of structural elements to achieve functional solutions. Understand and use the properties of materials to achieve functioning solutions. structures forces testing process. **Skills;** Drawing with accuracy Use of templates Assembly using a template Following a criteria and budget Using alternative materials Safe and correct use of hot glue.
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Year 9	**Topic** **Keeping ourselves and others safe within the workshop.** Understand the various hazards in a workshop environment, how to keep ourselves and others safe. Classroom based activities followed by workshop sessions. **Full half term**	Topic covering the dangers associated with each machine and how to operate them in a safe and responsible way. Each student to experience operating each machine and various activities and a reinforcement of previous work Additional areas covered include; Paints and finishes CAM machine **Knowledge;** Select from and use specialist tools, techniques, processes, equipment and machinery Tool recognition and use Classification of wood Types of polymers Joining techniques. **Skills;** Marking out Cutting Safe and correct use of Pillar drill Sanding machine Line bender Various hand tools assembly Surface preparation and finishing.	**Topic** **Egg wars.** A design and make project to produce a vehicle to carry an egg. **Full half term**	Each student will design a carrying system for an egg, they will incorporate an electronic steering system and compete against one another in order to destroy the opponent's egg The students will, build the chassis in wood and polymers and assemble the driving mechanism. **Knowledge;** Understand how more advanced mechanical systems used in their products enable changes in movement and force Select from and use specialist tools, techniques, processes, equipment and machinery. **Skills** Soldering and constructing mechanical devices Electrical circuit building.	**Topic** **Vacuum forming** A design and make project which will involve the making of a vacuumed formed product **Full half term**	The project involves producing a mould to meet a design requirement using the vacuum former. The students can design and make the mould which will need to meet certain criteria to be moulded in the former. Emphasis will be on smooth finishing and accuracy. **Knowledge;** Select from and use specialist tools, techniques, processes, equipment and machinery. Tool recognition and use Classification of wood Types of polymers & Resistant materials. Finishing techniques with polymers **Skills;** Use of vacuum former and finishing plastics	**Topic** **wooden storage box and safety.** A mainly making activity where the students make a pencil storage box from a single piece of softwood. **Full half term**	The emphasis is around reducing the amount of materials we use, marking out, cutting and assembly. Because the project is predominantly making the students will also be able to demonstrate the correct use of machines and tools and how to keep themselves safe as well as others. Students will record and display subject specific language as we proceed through the project. **Knowledge;** Select from and use specialist tools, techniques, processes, equipment and machinery. Tool recognition and use Classification of wood. Classification of metal. Joining techniques. **Skills;** Marking out Cutting Safe and correct use of Pillar drill Sanding machine Various hand tools assembly Surface preparation and finishing.	**Topic** **CAD CAM Design and make a cloche.** **DT / food/Science /outdoor Education** The project involves the designing and making the framework for a cloche.	This will start with a session on 2D design CAM software and some reminders on the basic drawing tools. Students will then develop skills in order to transfer the drawings to the CAM machine and operate the manufacture of the framework. Once produced the students will complete the cloche in the workshop before preparing the raised beds ready for planting and placing of the cloche. **Knowledge;** Classification of wood Types of polymers & Resistant materials. **Skills;** Measuring Marking out Cross halving joint Cutting Safe and correct use of Pillar drill Sanding machine Line bender Various hand tools Surface preparation and finishing.	**Topic** **Woodworking skills (joining)** The purpose of this project is to give the students some prior knowledge of joining wood techniques before embarking on a GCSE/ELC project. **Full half term**	students will manufacture various woodworking joints using both traditional and CNC methods. Emphasis will be on safe working practices, reinforcing the work done in previous projects, as well as care accuracy and attention to detail. **Knowledge;** Select from and use specialist tools, techniques, processes, equipment and machinery. Tool recognition and use **Skills;** Measuring Marking out Cross halving joint Mitre joint Butt joint Finger joint Mortise/ tenon Cutting Safe and correct use of Various machines and tools.
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Year 10	**Topic** **Keeping ourselves and others safe within the workshop.** Understand the various hazards in a workshop environment, how to keep ourselves and others safe. Classroom based activities followed by workshop sessions.	**Knowledge;** Select from and use specialist tools, techniques, processes, equipment and machinery Tool recognition and use **Skills;** Marking out Cutting Safe and correct use of Pillar drill Sanding machine Line bender Various hand tools assembly Surface preparation and finishing.	Each session will consist of 1)Knowledge/skills builder session 2) development of NEA portfolio **NEA areas to be covered;** **AO1** **Identify, investigate and outline design possibilities** **A01(A)** **Identify and investigate design possibilities.** User/client identified Existing design and designers work Impact on society	**Knowledge;** **Materials;** Understand the classification of each group, characteristics, uses etc. **T**imber Polymers Metals **Preparation of materials** Understand how each group of materials are prepared before use **Skills;** Cutting methods for various materials	Each session will consist of 1)Knowledge/skills builder session 2) development of NEA portfolio **NEA areas to be covered;** **AO1** **Identify, investigate and outline design possibilities** **A01(B)** **Producing a design brief & specification** Design brief justifying how the client needs and wants have been considered. Specification linked to client needs and wants	**Knowledge;** Materials; **Joining Materials** Understand how to join each group of materials **Cutting materials** Understand the various methods of cutting materials **Skills;** Practical activities to include; Joining materials Shaping materials.	Each session will consist of 1)Knowledge/skills builder session 2) development of NEA portfolio **NEA areas to be covered;** **A02** **Design and make prototypes that are fit for purpose** **A02(C)** **Generating a range of design ideas** Imaginative and creative ideas generate. Consider; Function Aesthetics innovation Isometric drawing Orthographic drawing	**Knowledge;** **Shaping materials** Understand the various methods of shaping each group of materials. Understanding of; Modern materials Smart materials Nanomaterials **Skills;** Drawing techniques explored and developed.	Each session will consist of 1)Knowledge/skills builder session 2) development of NEA portfolio **NEA areas to be covered;** **AO2** **Design and make prototypes that are fit for purpose** **AO2(D)** **Developing design ideas** **Develop and refine ideas formal and informal drawings and at least 1 model** **2D/3D techniques including CAD to develop prototype** Material research Cutting list	**Knowledge;** **Bending and forming materials** Understand the various methods of bending/forming each group of materials. **Casting and moulding materials** Understand the various methods of casting and moulding **Skills;** Practical activities to include; Bending and forming. Use of the casting system	Each session will consist of 1)Knowledge/skills builder session 2) development of NEA portfolio **NEA areas to be covered;** Environmental impact of the product Sustainability and the 6 R's	**Knowledge;** Understand that designing and making products are influenced by the cultural and social needs of your target market. Understand that products have an impact on lifestyle. Understand the social, economic and moral impact of designing and making products. be able to identify sustainable methods and products, and understand environmental issues associated with the designing and making of products
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Year 11	Each session will consist of 1)Knowledge/skills builder session 2) development of NEA portfolio **NEA areas to be covered;** **AO2** **Design and make prototypes that are fit for purpose** **AO2(E)** **Realising design ideas** Work with range of materials to produce accurate prototype using tools and equipment including CAM. Production plan Quality assurance	**Knowledge;** **Finishing materials** Understand the various methods of finishing each group of materials **Measuring** Understanding of metric system and the various ways to measure. **Marking out** Understanding and recognition of the tools used **Skills;** Practical use of measuring and marking out tools	Each session will consist of 1)Knowledge/skills builder session 2) development of NEA portfolio **NEA areas to be covered;** **AO2** **Design and make prototypes that are fit for purpose** **AO2(E)** **Realising design ideas** Work with range of materials to produce accurate prototype using tools and equipment including CAM.	**Knowledge;** Students must now Apply all the skills and knowledge taught to develop and produce high quality models and prototypes to suit the clients needs and wants **CAD CAM** Understand the role of CAD in the design process. Understand the range of CAD software available, and the uses to which it can be most effectively put. Be able to select and use CAD for a particular purpose. be able to send a CAD drawing package to a CAM machine to create a simple product. **Skills;** As appropriate to realise design including use of the CAD CAM system	Each session will consist of 1)Knowledge/skills builder session 2) development of NEA portfolio **NEA areas to be covered;** **AO2** **Design and make prototypes that are fit for purpose** **AO2(E)** **Realising design ideas** Work with range of materials to produce accurate prototype using tools and equipment including CAM.	**Knowledge;** Students must now Apply all the skills and knowledge taught to develop and produce high quality models and prototypes to suit the clients needs and wants **Skills;** As appropriate to realise designs	1)Each session will consist of 1)Knowledge/skills builder session to develop knowledge in preparation for written exam (50%) 2) development of NEA portfolio **NEA areas to be covered;** **AO3** **Analyse and evaluate** **AO3(F)** **Analysing and evaluating** Throughout the design process students need to demonstrate ongoing analysis and evaluation.	Knowledge; Core technical knowledge and Specialist technical principles revision New/emerging technologies Energy generation New materials Mechanical devices Materials Forces Ecological issues Scales of production Finishes and treatments	Each session will consist of 1)Knowledge/skills builder session to develop knowledge in preparation for written exam (50%)	**Knowledge;** Designing and making principles revision Areas to be covered include; The work of others Design communication Tolerances Specialist tools Specialist techniques		
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