Clare Mount Scheme of Learning

Subject: Design and Technology

Title of Unit: Year 7 Introduction to the workshop, Wooden robot

Overview of unit:	Through this unit of work, pupils will develop an understanding of the different timber classifications and types available, learning to describe the distinctions between them and identify specific examples. They will also gain an awareness of the importance of health and safety in the practical workshop environment. Alongside this knowledge, pupils will build confidence and practical ability by completing a series of small tasks, enabling them to safely and effectively use a range of hand tools and machinery to manufacture their own wooden robot.
Key skills:	-Identifying tools, correctly naming tools, -being be to set up the machines correctly -Selecting correct tools for the various task. -Knowledge and understanding of materials and their properties -Knowing how to select the correct materials -Working independently - Able to follow instruction to complete tasks
Link to focus priorities:	A key priority for Year 7 is to support pupils in their transition into the workshop, ensuring they feel safe, settled, and confident in this new environment. Pupils will be expected to follow the health and safety rules of the workshop to protect both themselves and others. They will begin to learn about different materials and their properties, as well as how to select and use the appropriate tools for specific tasks. The knowledge and skills introduced in Year 7 will form the foundation for their continued development in Year 8, where they will build on this understanding to tackle more complex projects with increasing independence and confidence.
Numeracy opportunities:	Pupils will develop an understanding of the difference between centimetres (cm) and millimetres (mm) and be able to measure accurately in millimetres. They will practice reading and measuring materials using a steel rule, applying their numeracy skills in a practical context.
Personal development:	Pupils will develop confidence in their new workshop environment by becoming familiar with its routines, equipment, and health and safety expectations. They will practice working independently while also supporting others during tasks, which will help to build essential social and communication skills. Through these experiences, pupils will develop personal qualities such as responsibility, teamwork, and self-confidence, laying the foundation for successful learning and collaboration in future projects.
Cultural capital:	Pupils will develop an understanding of sustainability and the environmental impact of material usage, considering both local and global perspectives.

	They will explore which materials can be recycled, how recycling processes work, and the importance of reducing waste in design and manufacturing. This knowledge will help pupils make informed decisions about material selection in their projects. Engaging with these topics also contributes to pupils' cultural capital, encouraging awareness of global environmental issues, responsible citizenship, and the role of design and technology in creating sustainable solutions.
CEIAG:	Pupils will explore careers related to Design Technology and construction, gaining an understanding of the range of pathways available and the skills required for different roles. They will investigate how knowledge of materials, tools, and design processes can be applied in real-world professions, helping them to make informed choices about future study and career opportunities. This supports CEIAG by linking classroom learning to potential careers and encouraging pupils to consider their own skills, interests, and aspirations within the design and construction industries.
Key assessment tasks:	Pupils will complete a series of focused practical tasks throughout this unit of work, culminating in a final project that will be assessed for accuracy, quality, and application of skills and knowledge. In addition to the practical assessment, pupils will complete an end-of-unit written or verbal assessment to demonstrate their understanding of the concepts covered, including materials, tools, health and safety, and the design process. These assessments will provide a clear measure of pupils' learning and progress in both practical and theoretical aspects of the subject.
Pathway objectives:	**Exceptional Performance (based on grade 5 to 9)** • Select appropriate materials, tools and techniques e.g. cutting, shaping, joining and finishing, accurately. • Understand why materials are used for particular jobs and the properties in those materials that make them suitable. • Evaluate their product against the specification and suggets modifications. **Pathway 1 Objectives (based on grade 1 to 4)** • Select their own tools and set up their working area for practical. • Develop their own designs using models and templates. • Evaluation referencing some parts of the design brief. **Pathway 2 Objectives (based on Entry Level)** • Begin to develop their design using simple construction techniques. • With help measure and mark out their materials. • Evaluate saying what they like and dislike about their product.

	Pathway 3 Objectives based on certificated courses • With support and guidance select the correct tools. • Explore how to use and hold basic tools correctly and safely. • Superficial evaluation about their work, discussion on materials and how they joined them together.
Key questions:	Questioning techniques will be adapted to meet pupils' individual abilities, including verbal and non-verbal methods. For example, pupils may respond with thumbs up or down, choose from multiple-choice options (A, B, or C), or engage in interactive games such as "Who Wants to Be a Millionaire" to make learning enjoyable. Each lesson will begin with a short recap, encouraging pupils to remember and build on prior knowledge. Pupils will be supported and encouraged to use the correct subject-specific terminology and will be asked a variety of questions using **WH-words** (what, why, when, how) to develop their understanding, critical thinking, and communication skills..

Clare Mount Scheme of Learning

Subject: Design and Technology

Title of Unit: Base unit, 3D Card modelling

Overview of unit:	In this unit, pupils will develop a range of design and practical skills through a series of creative projects, including designing and constructing a card model, creating a steampunk hat, and exploring micro-bot programming. Pupils will develop modelling skills through focused tasks and learn how ergonomics influences design, understanding its importance in creating functional and user-friendly products. They will explore the concept of scale and be able to explain its advantages when designing. Pupils will also be introduced to design movements, learning to identify key features of Memphis design. Alongside these theoretical concepts, pupils will develop practical construction techniques for manufacturing models from card, combining creativity with technical skills.
Key skills:	• Modelling and prototyping skills using card and other materials • Applying ergonomics to design practical and user-friendly products • Understanding and using scale effectively in design work • Identifying and explaining key features of design movements, such as Memphis

	• Developing construction techniques for card and other materials • Using hand tools and equipment safely and effectively • Following instructions to complete practical tasks independently • Combining creativity with technical skills in project work •Basic programming and logical thinking through micro-bot activities •Communicating ideas using appropriate design terminology
Link to focus priorities:	The base class is designed to build pupils' foundational skills and knowledge in Design Technology. This learning program introduces pupils to key design movements and teaches them how to recognise their defining features. It then develops practical skills in model-making using card, applying ergonomics, and creating scaled models. Pupils also explore how designers work with clients and specifications, developing an understanding of the design process in real-world contexts. These activities support the school's focus priorities by helping pupils transition confidently into the workshop, build practical and problem-solving skills, develop independence, and gain knowledge that will be further developed as they progress through the school..
Numeracy opportunities:	Understanding the difference between cm/mm and being able to measure in mm. Able to measure and mark out using a ruler correctly. Learning how scale is used in the design process and being able to apply this to the design environment.
Personal development:	The base class focuses on building pupils' confidence and self-esteem. This learning program is delivered in their own classroom to support their individual needs and minimise anxiety, providing a safe and familiar environment. Pupils will have the opportunity to experience what Design and Technology is about, developing valuable skills and knowledge that can be further built upon next year. This approach also supports a smooth transition into the workshop, helping pupils feel more confident, independent, and ready to engage with practical activities.
Cultural capital:	Pupils will learn about the process of how card is manufactured and the benefits and challenges this has for the environment. They will explore how the production and use of materials can impact the planet and why sustainable practices are important for climate control. This knowledge contributes to pupils' cultural capital by raising awareness of global environmental issues, encouraging responsible decision-making, and highlighting the role of design and technology in creating sustainable solutions for society.
CEIAG:	Pupils will explore careers related to Design Technology, learning about the variety of pathways and the skills required for different roles within the industry. Model-making will be highlighted as a key part of the design process, and pupils will have the opportunity to see real-world applications through curated YouTube clips and other examples. This approach supports pupils understand how classroom skills connect to professional

	opportunities, encouraging them to consider their own interests and potential future career paths in design and technology.
Key assessment tasks:	Pupils will complete a series of focused practical tasks throughout this unit, culminating in a final project that will be assessed for accuracy, quality, and application of skills and knowledge. In addition to the practical assessment, pupils will complete an end-of-unit assessment to demonstrate their understanding of the concepts covered, including materials, tools, design movements, ergonomics, and the design process. These assessments provide a clear measure of pupils' learning, progress, and ability to apply their knowledge in both practical and theoretical contexts.
Pathway objectives:	**Exceptional Performance (based on grade 5 to 9)** • Analyse the work of past and present Design movements develop and broaden their understanding. • Evaluate their work both during and at the and at the of the project referencing the design brief and specification. • Excellent ability to develop initial ideas that reflect the design brief and annotation that referencing the needs and wants of the client. **Pathway 1 Objectives (based on grade 1 to 4)** • Explain what design movements are and talk about some. (Memphis, Bauhaus and Charles Rennie Mackintosh) • Evaluate their 3D models against the original design criteria e.g. how well it meets the intended purpose. • Constant ability to develop initial ideas that reflect the design brief and annotation that referencing the needs and wants of the client. **Pathway 2 Objectives (based on Entry Level)** • Able to recognise Memphis design and give 1 key feature of it. • Evaluate 2 points to improve your next model to improve it. • Some ability to develop initial ideas that reflect the design brief and annotating 2 points about the design. **Pathway 3 Objectives based on certificated courses** • Basic understanding of design movements and what they are. • Start to evaluate their products as they develop the 3D card models, identifying strengths and possible changes they might make. • Basic initial ideas that reflect some aspects of the design brief and minimal annotation.
Key questions:	Question techniques will vary on pupil's ability, verbal, none-verbal. For example, thumbs up or down for responses, choice questions A, B and C, play how wants to be a millionaire making it fun. Each lesson starts with remember this from the previous question. Encouraging pupils to use the correct terminology for the subject. Questions using wh-words, what, why, when etc.

Clare Mount Scheme of Learning

Subject: Design and Technology

Title of Unit: Yr8 Mechanisms, mechanical toy

Overview of unit:	This Year 8 unit of work is designed to develop pupils' knowledge and understanding of mechanisms and how they are used to move and change the direction of motion. Pupils will explore both mechanical and electronic mechanisms, considering their advantages and disadvantages, while also engaging in practical challenges using LEGO gear cogs, pulleys, and other components to solve design problems involving movement. Alongside this, they will develop practical workshop skills, learning how to measure, mark out, and accurately cut basic wood joints. The unit culminates in a design-and-make project where pupils apply their learning to design and create a mechanical toy that incorporates a moving mechanism, encouraging creativity, problem-solving, and confidence in using tools and materials.
Key skills:	• Understanding how mechanisms move and change direction of motion • Comparing advantages and disadvantages of mechanical and electronic mechanisms • Problem-solving through design challenges using LEGO gear cogs and pulleys • Developing accuracy in measuring, marking out, and cutting materials • Constructing basic wood joints with precision and care • Applying creativity to design solutions for movement in products • Integrating mechanisms into a functional mechanical toy design • Using tools and equipment safely and effectively in the workshop • Testing, evaluating, and refining design ideas to improve outcomes
Link to focus priorities:	This unit of work builds on the skills and knowledge pupils developed in Year 7, where they learned to work safely in the workshop, use basic tools, and explore simple making processes. Pupils also began to develop their design thinking, generating ideas and reflecting on outcomes to improve their work. In Year 8, they will extend this learning by focusing on mechanisms and types of motion, exploring how these can create movement and solve design challenges. Practical tasks, including working with gears, pulleys, and cams, will allow pupils to apply their workshop skills with greater accuracy and independence. They will also continue to develop their understanding of design decisions and how functionality influences

	product outcomes. This progression links prior learning to more complex projects, preparing pupils for future Design Technology challenges.
Numeracy opportunities:	Understanding the difference between cm/mm and being able to measure in mm. Able to read and measure materials using a steel rule.
Personal development:	This unit provides a safe environment for pupils to work independently, make their own choices, and take ownership of their learning. Through experimentation with mechanisms and design challenges, pupils learn that mistakes are part of the design process and an opportunity for growth, helping them develop problem-solving skills, perseverance, and self-belief.
Cultural capital:	This unit explores the evolution of mechanisms and their impact on the world, giving pupils a sense of cultural capital. From simple machines in the Stone Age to industrial machinery and modern computerised mechanisms, pupils will see how design has shaped society and daily life. Understanding this history helps them appreciate the role of design in human progress and inspires creative problem-solving in their own projects.
CEIAG:	They will explore roles such as motor mechanics, technicians, and engineers, and learn about the skills and qualifications required for these pathways. Pupils will also be introduced to possible college courses and apprenticeships that can lead to careers in designing, building, and maintaining mechanical systems.
Key assessment tasks:	Assessment in this unit is continuous, focusing on pupils' recall, understanding, and ability to follow instructions to complete design tasks independently. Practical work is used to monitor progress, skills, and application of knowledge throughout the unit. At the end of the unit, a summative assessment evaluates what pupils have learned, including connections to previous units, testing their ability to recall and apply prior knowledge alongside new skills.
Pathway objectives:	**Exceptional Performance (based on grade 5 to 9)** • Explain how mechanism change speed and direction and types of motions they create and reduce the effort required to move a load. • Create a halving joint demonstrating your ability to measure, mark and cut with a high level of accuracy. • Product shows a good level of making/finishing skills that are consistent with the final outcome. • Disassemble products and analyse how they work explaining the mechanisms and benefits of them in the products. E.g. DVD player using a pulley and bands to open and shut the disc holder. **Pathway 1 Objectives (based on grade 1 to 4)** • Know how mechanical systems such as cams, pulleys or gears create movement. • Demonstrate how to use a template to mark and cut the halving joint. • Product shows an adequate level of making/finishing skills that are fitting to the final outcome.

	• Dissemble products and consider the user and how the mechanisms support them. **Pathway 2 Objectives (based on Entry Level)** • Explore the use of mechanism and they are used in our World. • Demonstrate basic skills creating a butt joint for the chassis. • Final product is of sufficient quality but could do with further development. • Dissemble a product and suggest why they have used the mechanism, gears or pulley. **Pathway 3 Objectives based on certificated courses** • Understand simple mechanism, axle, wheels, hinges • Use a simple construction method for constructing the chassis. • Final product shows a basic level of making/finishing skills. • Analyse a bike and explain the benefit of gears for the user.
Key questions:	general or yes/no questions, questions using wh-words, choice questions, and disjunctive or tag/tail questions and lost recall questions recapping on key concepts for the pupils.

Clare Mount Scheme of Learning

Subject: Yr9

Title of Unit: CAD/CAM, LED Light

Overview of unit:	This unit is designed to extend pupils' CAD/CAM skills by teaching them how to manipulate images from the internet and convert them into formats suitable for laser cutting and engraving. Pupils will build on their practical workshop skills by learning and applying a new type of wood joint. The unit also introduces basic electronics, allowing pupils to explore circuits, construct and test them, and understand the function of different output devices. The project comprises three tasks, a photo frame for the Health and Safety passport, an LED light, and a board game, combining practical making with Tech Soft design skills to create functional and creative products.
Key skills:	• Manipulating digital images and converting them into vector formats for laser cutting and engraving • Using Tech Soft to create and modify designs accurately • Combining digital design with practical making to produce functional products • Measuring, marking out, and cutting wood accurately • Constructing and applying a new type of wood joint • Using tools and equipment safely and effectively • Understanding basic electrical circuits and components • Constructing, testing, and troubleshooting circuits

	• Using output devices (e.g., LEDs) effectively in a project • Applying design ideas to solve practical challenges • Integrating multiple materials, mechanisms, or components in a single product • Reflecting on design and making choices to improve functionality and aesthetics
Link to focus priorities:	This unit builds on pupils' existing skills while introducing new techniques to further develop their understanding of Design and Technology. It emphasizes the importance of CAD/CAM in modern design practice and shows how digital tools complement traditional workshop skills, enhancing a designer's capabilities. Pupils will navigate real-world design constraints by manipulating digital images for laser cutting and engraving, constructing new wood joints, and exploring basic electronic circuits. Through these tasks, they develop problem-solving, practical, and technical skills while gaining insight into how design continually evolves. This unit also supports focused priorities such as fostering creativity, resilience through trial and error, independent decision-making, and preparing pupils for future design and technology challenges.
Numeracy opportunities:	Pupils will develop their numeracy skills by understanding the difference between centimetres and millimetres and accurately measuring in millimetres. They will learn to use a steel rule to measure materials precisely and interpret grid reference numbers in Tech Soft to determine dimensions correctly. These skills are essential for producing accurate CAD designs and ensuring successful outcomes in both digital and practical tasks. In addition, pupils will apply mathematical thinking when scaling designs, calculating material sizes, and planning measurements for laser cutting and construction, reinforcing the link between numeracy and practical design.
Personal development:	This unit also supports pupils' personal development by encouraging them to grow as individuals, respect the views of others, and express their own ideas with confidence. It promotes resilience by providing a safe environment where pupils are supported to take creative risks, explore their ideas, learn from mistakes, and celebrate their successes. Through this process, pupils build self-esteem, develop independence, and contribute to a positive, inclusive learning culture.
Cultural capital:	Pupils will explore how emerging technologies are shaping the modern world and influencing the way we design and make products. They will learn how innovations in Design Technology improve everyday products and have life-changing applications, such as medical procedures like knee replacements. By understanding these advances, pupils gain insight into the real-world impact of the skills they are developing and appreciate how design and technology contribute to solving problems and improving lives, enhancing their cultural capital.
CEIAG:	As part of the unit, pupils will explore a range of careers related to Design Technology and the construction industry. They will learn about the skills and pathways required for roles such as product designers, architects, engineers, furniture makers, and technicians. The unit places particular focus on opportunities in CAD/CAM and digital design, highlighting how these skills are increasingly in demand. Pupils will also be introduced to

	potential college courses and apprenticeships, helping them understand how the knowledge and skills they are developing can lead to real-world career opportunities.
Key assessment tasks:	Assessment throughout this unit is continuous and formative, focusing on pupils' ability to recall key knowledge, follow instructions, and complete tasks independently. Ongoing checks during practical and theory sessions provide regular feedback and support to guide learning. Key assessment opportunities include evaluating pupils' accuracy in measuring and constructing projects, their ability to apply CAD/CAM and electronics skills, and their problem-solving and design decisions. At the end of the unit, a summative assessment reviews what pupils have learned, drawing on both current content and knowledge from previous units to test retention and understanding over time.
Pathway objectives:	**Exceptional Performance (based on grade 5 to 9)** • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. • Effective use of CAD/CAM developing a high quality, complex design demonstrating their understanding of how to manipulate an image using Tech soft. • Excellent use of the design brief and specification referenced throughout the design stages justifying decisions. • Excellent product analyses reflecting ergonomics, materials and intended users. **Pathway 1 Objectives (based on grade 1 to 4)** • Understanding circuits and being able to problem solve if the circuit does not work e.g. check power source, components, are components in the correct position +/_. • Demonstrated good ability using CAD/CAM understanding the benefits and how to produce a worthy final outcome. • Good investigation of the design brief and client needs and wants, referred to through the design process. • Detailed product analyses showing understanding of materials and their properties. **Pathway 2 Objectives (based on Entry Level)** • Able to create a basic circuit that has input and output, e.g. buzzer, light etc. • Some skills on using CAD/CAM able to set the laser height for material and check settings for material. • An attempt to identify the client needs and wants, with basic understanding of the specification. • Some product analyses, looking at shape, safety and who the product is aimed at. **Pathway 3 Objectives based on certificated courses** • Simple circuits incorporating input and output and their symbols.

	• Basic skills using CAD/CAM, demonstrated inputting an imaging and setting colours for engraving and cutting. • Limited design focus and understanding of the design brief. • Basic product analyses using some aspects of ACCESSFM.
Key questions:	Key questions are embedded into each lesson to support both short- and long-term memory. These questions are tailored to suit the needs of each class and may include approaches such as thumbs up/down, multiple choice, or targeted questioning. This low-risk, high-impact strategy helps reinforce key concepts, encourages active participation, and builds pupil confidence by allowing all learners to engage meaningfully at their own level.