Ormiston Meridian Academy

[OAT] Ormiston Academies Trust
AN OAT ACADEMY

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Principal: Mrs C Stanyer

Subject: Engineering Design — Year 11 Curriculum Map 2024 - 25

Week Commencing	Topic (including links to additional resources)	Assessment Window
Staff INSET 02/09 Students Return 03/09	Introduction of R040 brief and NEA (coursework assessment criteria). Students will be given a design that they must create.	
09/09/2024	Students will have a clear understanding of the differences between primary and secondary research methods, and how to apply them effectively in design. They will explore various research techniques, both primary (e.g., physical analysis, surveys) and secondary (e.g., books, online sources), and will engage in hands-on activities that utilize both types of research to inform their design decisions. **Key Learning Points:** 1. **Understanding Primary Research Methods**: o **Primary research** involves gathering original data firsthand to gain insights into a particular problem or area of inquiry. o Students will learn about various primary research techniques, including: ▪ **Physical analysis**: Hands-on examination of products, materials, or prototypes to assess their qualities or performance. ▪ **Questioning**: Conducting interviews or creating **surveys** to gather information directly from people, such as classmates, users, or experts. ▪ **Surveys and polls**: Collecting opinions or feedback through structured questioning to generate data that can inform design choices. o Examples could include physically testing products to analyze durability or surveying peers to understand user preferences. 2. **Exploring Secondary Research Sources**: o **Secondary research** involves using existing data or information from other sources to inform design decisions. o Students will explore various secondary research methods, such as: ▪ **Internet/online sources**: Using reliable websites, databases, and online articles to gather background information or industry trends. ▪ **Books and literature**: Consulting design manuals, reference books, or academic papers to build knowledge of historical design practices, materials, or case studies. ▪ **Manuals and technical documents**: Referring to instruction manuals, standards, or guides for specific technical details. ▪ **Images and drawings**: Analyzing existing designs, images, and blueprints to inspire or inform the design process. Examples of secondary research could include finding case studies on similar products, reviewing technical drawings, or gathering inspiration from online image galleries.	

16/09/2024	Students will have a clear understanding of the differences between primary and secondary research methods, and how to apply them effectively in design. They will explore various research techniques, both primary (e.g., physical analysis, surveys) and secondary (e.g., books, online sources), and will engage in hands-on activities that utilize both types of research to inform their design decisions. **Key Learning Points:** 1. **Class-Based Activity: Applying Primary and Secondary Research**: o To reinforce their understanding, students will undertake a **class-based activity** that integrates both primary and secondary research methods: ▪ **Primary research**: Students will conduct real-time research by **questioning their classmates**, gathering user feedback or preferences related to a particular product or design concept. ▪ **Secondary research**: In parallel, students will search for relevant **images, articles, or books** that provide additional insights or examples of similar designs or materials. o This activity will encourage students to combine data from both sources, critically evaluating how primary findings (e.g., peer preferences) and secondary sources (e.g., case studies, historical designs) can inform their own design work. 2. **Comparing and Contrasting Research Methods**: o Students will learn to distinguish between the strengths and limitations of primary and secondary research. For example: ▪ **Primary research** offers **real-time data** and personal insights but may be limited in scope or time-consuming. ▪ **Secondary research** provides **broader context** and access to existing knowledge but may lack the specificity or direct relevance to a particular problem. o By comparing the results from both types of research, students will understand how each method contributes uniquely to their design process, helping them to create well-informed and effective design proposals.	
23/09/2024	Students will be able to effectively plan and manage practical work, incorporating key aspects such as time/project management, conducting risk assessments, and implementing quality control checks to ensure a successful and safe outcome. **Key Learning Points:** 1. **Introduction to Planning Practical Work**: o Planning is a crucial step in any practical project, ensuring that tasks are completed efficiently, safely, and to a high standard. o Students will learn the importance of **structured planning**, including setting clear objectives, organizing resources, and anticipating potential challenges. 2. **Time and Project Management**: o Students will be introduced to **time management techniques** that are essential for completing projects within deadlines. This includes: ▪ **Creating a project timeline**: Breaking down the project into manageable tasks (e.g., material preparation, construction, finishing) and assigning timeframes to each phase. ▪ **Prioritizing tasks**: Learning how to prioritize tasks based on complexity, material availability, and deadlines, ensuring that critical steps are completed in the right order. ▪ **Setting milestones**: Students will establish key milestones or checkpoints throughout the project to track progress and make adjustments if needed.	

	Managing resources: Effective **resource management** involves ensuring that the necessary materials, tools, and equipment are available when needed, reducing delays or disruptions.	
30/09/2024	Students will be able to effectively plan and manage practical work, incorporating key aspects such as time/project management, conducting risk assessments, and implementing quality control checks to ensure a successful and safe outcome. **Key Learning Points:** 1. **Risk Assessment**: o Safety is paramount in any practical activity. Students will learn how to conduct a **risk assessment** before starting any project, identifying potential hazards and taking appropriate steps to minimize risks. o Key components of a risk assessment include: ▪ **Identifying hazards**: Students will assess the potential dangers associated with using tools, machines, materials, or chemicals, as well as general workshop risks (e.g., tripping hazards, electrical safety). ▪ **Assessing risks**: Students will evaluate the likelihood and severity of each hazard, categorizing risks as low, medium, or high, based on their potential impact. ▪ **Implementing controls**: To mitigate risks, students will establish control measures such as wearing **PPE**, ensuring proper machine guarding, and following safe handling procedures for chemicals and materials. ▪ **Ongoing monitoring**: Risk assessments will be revisited throughout the project to ensure that safety controls remain effective and that any new hazards are addressed promptly. 2. **Quality Control Checks**: o Maintaining quality throughout the project is essential to ensure the final product meets the required standards. Students will implement **quality control measures** at various stages of their work: ▪ **Initial checks**: Before beginning construction, students will verify that materials and tools meet the necessary specifications, ensuring that they are suitable for the task. ▪ **In-process checks**: As the project progresses, students will conduct regular **quality inspections** at key milestones, checking for accuracy in cutting, shaping, and assembly, as well as ensuring that materials are used efficiently and safely. ▪ **Final inspection**: Upon completing the project, students will carry out a **final quality check** to ensure that the prototype or product is functional, meets design specifications, and is free of defects. This may involve testing durability, fit, or finish. 3. **Balancing Quality, Safety, and Efficiency**: o Throughout the project, students will learn to balance the demands of quality control, safety, and time management. For example: ▪ **Quality vs. speed**: Students will understand that rushing through tasks can compromise both quality and safety, and will learn how to maintain high standards while staying on schedule. ▪ **Safety vs. productivity**: While it's important to work efficiently, students will prioritize safety by adhering to the risk assessment and taking the necessary precautions, even if it means adjusting timelines. 4. **Planning Tools and Resources**: o Students will be introduced to project planning tools, such as **Gantt charts**, task lists, and **risk assessment templates**, to help them organize their work and track progress. These tools will provide a visual guide to managing time and resources effectively, as well as ensuring that safety and quality are prioritized throughout the project.	

07/10/2024	Students will be able to effectively plan and manage practical work, incorporating key aspects such as time/project management, conducting risk assessments, and implementing quality control checks to ensure a successful and safe outcome. **Key Learning Points:** 1. **Risk Assessment**: o Safety is paramount in any practical activity. Students will learn how to conduct a **risk assessment** before starting any project, identifying potential hazards and taking appropriate steps to minimize risks. o Key components of a risk assessment include: ▪ **Identifying hazards**: Students will assess the potential dangers associated with using tools, machines, materials, or chemicals, as well as general workshop risks (e.g., tripping hazards, electrical safety). ▪ **Assessing risks**: Students will evaluate the likelihood and severity of each hazard, categorizing risks as low, medium, or high, based on their potential impact. ▪ **Implementing controls**: To mitigate risks, students will establish control measures such as wearing **PPE**, ensuring proper machine guarding, and following safe handling procedures for chemicals and materials. ▪ **Ongoing monitoring**: Risk assessments will be revisited throughout the project to ensure that safety controls remain effective and that any new hazards are addressed promptly. 2. **Quality Control Checks**: o Maintaining quality throughout the project is essential to ensure the final product meets the required standards. Students will implement **quality control measures** at various stages of their work: ▪ **Initial checks**: Before beginning construction, students will verify that materials and tools meet the necessary specifications, ensuring that they are suitable for the task. ▪ **In-process checks**: As the project progresses, students will conduct regular **quality inspections** at key milestones, checking for accuracy in cutting, shaping, and assembly, as well as ensuring that materials are used efficiently and safely. ▪ **Final inspection**: Upon completing the project, students will carry out a **final quality check** to ensure that the prototype or product is functional, meets design specifications, and is free of defects. This may involve testing durability, fit, or finish. 3. **Balancing Quality, Safety, and Efficiency**: o Throughout the project, students will learn to balance the demands of quality control, safety, and time management. For example: ▪ **Quality vs. speed**: Students will understand that rushing through tasks can compromise both quality and safety, and will learn how to maintain high standards while staying on schedule. ▪ **Safety vs. productivity**: While it's important to work efficiently, students will prioritize safety by adhering to the risk assessment and taking the necessary precautions, even if it means adjusting timelines. 4. **Planning Tools and Resources**: o Students will be introduced to project planning tools, such as **Gantt charts**, task lists, and **risk assessment templates**, to help them organize their work and track progress. These tools will provide a visual guide to managing time and resources effectively, as well as ensuring that safety and quality are prioritized throughout the project.	
14/10/2024	Students will have developed practical skills in producing a prototype, learning the safe use of hand tools, machines, materials, and processes. Emphasis will be placed on safe working procedures and effective handling of materials, chemicals, and finishes.	

	Key Learning Points: 1. **Introduction to Hand Tools, Machines, and Processes**: o Students will be introduced to essential **hand tools** (e.g., saws, hammers, chisels) and **machines** (e.g., drills, sanders) used in the prototype-making process. o They will learn about **processes** such as cutting, shaping, sanding, and assembling, with a focus on using each tool and machine safely and correctly. 2. **Safe Use of Tools and Equipment**: o Safety is paramount, and students will be taught proper **safety protocols** for using tools and machinery. This includes wearing appropriate **personal protective equipment (PPE)**, understanding emergency procedures, and maintaining a clean and organized workspace. o The teacher will provide **step-by-step guidance** on how to handle tools and machines safely, avoiding common hazards. 3. **Safe Working with Materials, Chemicals, and Finishes**: o Students will learn how to safely work with different **materials** (e.g., wood, metal, plastics) and **finishes** (e.g., paints, varnishes). o The unit will cover the correct handling and storage of **chemicals and solvents**, understanding potential risks, and the importance of using these substances in a well-ventilated area or with appropriate protective gear.	
21/10/2024	Students will have developed practical skills in producing a prototype, learning the safe use of hand tools, machines, materials, and processes. Emphasis will be placed on safe working procedures and effective handling of materials, chemicals, and finishes. **Key Learning Points:** 1. **Introduction to Hand Tools, Machines, and Processes**: o Students will be introduced to essential **hand tools** (e.g., saws, hammers, chisels) and **machines** (e.g., drills, sanders) used in the prototype-making process. o They will learn about **processes** such as cutting, shaping, sanding, and assembling, with a focus on using each tool and machine safely and correctly. 2. **Safe Use of Tools and Equipment**: o Safety is paramount, and students will be taught proper **safety protocols** for using tools and machinery. This includes wearing appropriate **personal protective equipment (PPE)**, understanding emergency procedures, and maintaining a clean and organized workspace. o The teacher will provide **step-by-step guidance** on how to handle tools and machines safely, avoiding common hazards. 3. **Safe Working with Materials, Chemicals, and Finishes**: o Students will learn how to safely work with different **materials** (e.g., wood, metal, plastics) and **finishes** (e.g., paints, varnishes). The unit will cover the correct handling and storage of **chemicals and solvents**, understanding potential risks, and the importance of using these substances in a well-ventilated area or with appropriate protective gear.	
October Half Term		
04/11/2024	Students will have developed practical skills in producing a prototype, learning the safe use of hand tools, machines, materials, and processes. Emphasis will be placed on safe working procedures and effective handling of materials, chemicals, and finishes. **Key Learning Points:** 1. **Introduction to Hand Tools, Machines, and Processes**:	

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11/11/2024	Students will continue to refine their practical skills in safely using a variety of tools, machines, and processes, guided by the teacher. Students will apply these skills in the production of prototypes, mastering techniques for cutting, shaping, and forming materials using both traditional and modern methods, including CAD/CAM and rapid prototyping. **Key Learning Points:** 1. **Modern Prototyping Methods**: ○ Students will also be introduced to **rapid prototyping** techniques, such as **3D printing** and **laser cutting**, which allow for the quick and accurate creation of prototype components directly from digital designs. ○ By integrating **CAD/CAM** technology, students will learn how to transition their digital designs into physical models, understanding the benefits of these technologies in terms of precision and efficiency. 2. **Combining Traditional and Digital Processes**: ○ Throughout the prototype-making process, students will have the opportunity to combine traditional techniques with modern digital processes. For example, they may **mark out** and manually cut materials while using **CAD/CAM** for more intricate components. ○ This combination of approaches will enable students to understand how different tools and processes complement one another, leading to more refined and professional prototypes. 3. **Teacher Guidance and Skill Mastery**: ○ Throughout the unit, the teacher will provide continuous guidance, offering instruction on more advanced techniques as students become comfortable with the basics. As students gain confidence, they will be encouraged to take more ownership of the prototyping process, applying their skills with increasing independence while maintaining safe working practices.	OAT Eng / Maths / Sci
18/11/2024	Students will continue to refine their practical skills in safely using a variety of tools, machines, and processes, guided by the teacher. Students will apply these skills in the production of prototypes, mastering techniques for cutting, shaping, and forming materials using both traditional and modern methods, including CAD/CAM and rapid prototyping. **Key Learning Points:** 1. **Modern Prototyping Methods**:	Achievement Round 1

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02/12/2024	Students will have developed practical skills in producing a prototype, learning the safe use of hand tools, machines, materials, and processes. Emphasis will be placed on safe working procedures and effective handling of materials, chemicals, and finishes. **Key Learning Points:** 1. **Introduction to Hand Tools, Machines, and Processes**: ○ Students will be introduced to essential **hand tools** (e.g., saws, hammers, chisels) and **machines** (e.g., drills, sanders) used in the prototype-making process.	

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Christmas Break		
06/01/2025	Students will continue to refine their practical skills in safely using a variety of tools, machines, and processes, guided by the teacher. Students will apply these skills in the production of prototypes, mastering techniques for cutting, shaping, and forming materials using both traditional and modern methods, including CAD/CAM and rapid prototyping. **Key Learning Points:** 1. **Modern Prototyping Methods**: ○ Students will also be introduced to **rapid prototyping** techniques, such as **3D printing** and **laser cutting**, which allow for the quick and accurate creation of prototype components directly from digital designs. ○ By integrating **CAD/CAM** technology, students will learn how to transition their digital designs into physical models, understanding the benefits of these technologies in terms of precision and efficiency. 2. **Combining Traditional and Digital Processes**: ○ Throughout the prototype-making process, students will have the opportunity to combine traditional techniques with modern digital processes. For example, they may **mark out** and manually cut materials while using **CAD/CAM** for more intricate components. ○ This combination of approaches will enable students to understand how different tools and processes complement one another, leading to more refined and professional prototypes. 3. **Teacher Guidance and Skill Mastery**: ○ Throughout the unit, the teacher will provide continuous guidance, offering instruction on more advanced techniques as students become comfortable with the basics. As students gain confidence, they will be encouraged to take more ownership of the prototyping process, applying their skills with increasing independence while maintaining safe working practices.	
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20/01/2025	Students will continue to refine their practical skills in safely using a variety of tools, machines, and processes, guided by the teacher. Students will apply these skills in the production of prototypes, mastering techniques for cutting, shaping, and forming materials using both traditional and modern methods, including CAD/CAM and rapid prototyping. **Key Learning Points:** 1. **Modern Prototyping Methods**: ○ Students will also be introduced to **rapid prototyping** techniques, such as **3D printing** and **laser cutting**, which allow for the quick and accurate creation of prototype components directly from digital designs. ○ By integrating **CAD/CAM** technology, students will learn how to transition their digital designs into physical models, understanding the benefits of these technologies in terms of precision and efficiency. 2. **Combining Traditional and Digital Processes**: ○ Throughout the prototype-making process, students will have the opportunity to combine traditional techniques with modern digital processes. For example, they may **mark out** and manually cut materials while using **CAD/CAM** for more intricate components. ○ This combination of approaches will enable students to understand how different tools and processes complement one another, leading to more refined and professional prototypes. 3. **Teacher Guidance and Skill Mastery**: ○ Throughout the unit, the teacher will provide continuous guidance, offering instruction on more advanced techniques as students become comfortable with the basics. As students gain confidence, they will be encouraged to take more ownership of the prototyping process, applying their skills with increasing independence while maintaining safe working practices.	
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03/02/2025	Students to develop their coursework folders in line with exam board expectations. Ensuring that work is ready for final marking and moderation. This will include development of work following individual feedback.	Achievement Round 2
10/02/2025	Students to develop their coursework folders in line with exam board expectations. Ensuring that work is ready for final marking and moderation. This will include development of work following individual feedback.	Achievement Round 2
February Half Term		
24/02/2025	Students to develop their coursework folders in line with exam board expectations. Ensuring that work is ready for final marking and moderation. This will include development of work following individual feedback.	
03/03/2025	Exam preparation for Exam, focusing on DDI information from AR2	
10/03/2025	Exam preparation for Exam, focusing on DDI information from AR2	
17/03/2025	Exam preparation for Exam, focusing on DDI information from AR2	
24/03/2023	Exam preparation for Exam, focusing on DDI information from AR2	
31/03/2025	Exam preparation for Exam, focusing on DDI information from AR2	
07/04/2025	Exam preparation for Exam, focusing on DDI information from AR2	
Easter Break		
28/04/2025		
05/05/25		GCSE
12/05/2025		GCSE
19/05/2025		GCSE

May Half Term		
02/06/2025		GCSE
09/06/2025		GCSE
16/06/2025		GCSE
23/06/2025		
30/06/2025		
07/07/2025		
14/07/2025		
21/07/2025		