



Curriculum Map For Product Design Year 12

YEAR 12	Autumn 1	Autumn 2
Topics	<p align="center">Architecture Based Project</p> <p align="center">AO1 - Identifying & Investigating Design Possibilities to Address Needs and Wants</p> <p align="center">AO2 - Design & Make Prototypes That Are Fit For Purpose</p>	<p align="center">Architecture Based Project</p> <p align="center">AO2 - Design & Make Prototypes That Are Fit For Purpose</p> <p align="center">AO3 - Analyse and Evaluate</p> <ul style="list-style-type: none"> • Design Decisions and Outcomes, Including for Prototypes Made By Themselves and Others • Wider Issues in Design & Technology
Substantive Knowledge – The Knowledge Taught By The Teacher	<p>Students will learn how to:</p> <ul style="list-style-type: none"> • Analyse a given context effectively. • Effectively use PowerPoint for presentation purposes. • Create a themed mood and justify image selection. • Analyse effectively a product. • Use effective drawing skills to communicate. • Put into practice knowledge of materials and processes including use of modelling materials such as foamboard, modelling card and CAD/CAM techniques for architectural modelling. • Create a range of interesting and imaginative ideas with meaningful annotation which meets the needs of the chosen user. • Effectively model initial designs. • Be aware of and identify key design movements Recognise the impact of the development of microelectronics. 	<p>Students will learn how to:</p> <ul style="list-style-type: none"> • Explain the different stages of a design process. • Discuss and demonstrate the development of a prototype from design proposals. • Identify the different design methodologies used in the corporate world. • Explain the cyclic nature of commercial design and manufacture. • Describe how commercial and school projects result in possible improvements and modifications of an original idea. • Discuss and demonstrate good and safe working practices including the correct use of equipment and including safety for self and others in a workshop situation: <ul style="list-style-type: none"> - Discuss the importance of accuracy in manufacture.
Disciplinary Knowledge – How The Knowledge Will Be Developed & Applied	<ul style="list-style-type: none"> • Analysis of the work of others for external influences and inspiration. • Self-reflection and evaluation of research. • Self-reflection and evaluation of designs. • Responding to client feedback to meet their needs. • To understand how the work of key designers still influences our world today. 	<ul style="list-style-type: none"> • Analysis of the work of others for external influences and inspiration. • Self-reflection and evaluation of research. • Self-reflection and evaluation of designs. • Responding to client feedback to meet their needs. • To understand how the work of key designers still influences our world today.

	<ul style="list-style-type: none"> Describe how the use of feedback and testing informs the evaluation process. 	<ul style="list-style-type: none"> Describe how the use of feedback and testing informs the evaluation process.
	<ul style="list-style-type: none"> Responding to client feedback to meet their needs. To understand how the work of key designers still influences our world today. Understand what designers do and how they work. Understand and appreciate that external issues influence designs and designers. Understand how developments in technology influences product design and manufacture. Understand the responsibility of the designer and manufacturer to use sustainable materials and ethical production methods, developing culturally acceptable designs that don't offend race, gender or religion. Understand how products can be designed to be repaired and recycled. 	<ul style="list-style-type: none"> To understand how the work of key designers still influences our world today. Understand what designers do and how they work. Understand and appreciate that external issues influence designs and designers. Understand how developments in technology influences product design and manufacture. Understand the responsibility of the designer and manufacturer to use sustainable materials and ethical production methods, developing culturally acceptable designs that don't offend race, gender or religion. Understand how products can be designed to be repaired and recycled.
Skills	<ul style="list-style-type: none"> Effective use of PowerPoint for presentation purposes. Focus of literacy skills to explain and justify all research and decisions made. Problem solving. Analysing existing products with the purpose of taking influence. User profiling. To develop individual drawing skills/style. Manual and CAD/CAM prototyping skills development. 	<ul style="list-style-type: none"> Effective use of PowerPoint for presentation purposes. Focus of literacy skills to explain and justify all research and decisions made. Problem solving. Analysing existing products with the purpose of taking influence. User profiling. To develop individual drawing skills/style. Manual and CAD/CAM prototyping skills development.
Links To Prior Learning	<ul style="list-style-type: none"> Combining all skills from KS3 and KS4. Test/re-test and consolidation of all prior KS4 theory topics. Tessellation. Use of workshop tools and equipment. Modelling quality prototypes reflecting designs. Manufacturing according to individual designs and plans. 	<ul style="list-style-type: none"> Combining all skills from KS3 and KS4. Test/re-test and consolidation of all prior KS4 theory topics. Tessellation. Use of workshop tools and equipment. Modelling quality prototypes reflecting designs. Manufacturing according to individual designs and plans.
Literacy/ Numeracy	<ul style="list-style-type: none"> Literacy: ongoing self-reflection and evaluation, the analysis and comprehension of feedback from others. Numeracy: accuracy of measuring and marking and use of scale and tessellation. Using settings on tools 	<ul style="list-style-type: none"> Literacy: ongoing self-reflection and evaluation, the analysis and comprehension of feedback from others. Numeracy: accuracy of measuring and marking and use of scale and tessellation. Using settings on tools

	and equipment to work within tolerances.	and equipment to work within tolerances.
Cross Curricular	<ul style="list-style-type: none"> Understand the responsibility of the designer and manufacturer to use sustainable materials and ethical production methods, developing culturally acceptable designs that don't offend race, gender or religion. Understand how products can be designed to be repaired and recycled. 	<ul style="list-style-type: none"> Understand the responsibility of the designer and manufacturer to use sustainable materials and ethical production methods, developing culturally acceptable designs that don't offend race, gender or religion. Understand how products can be designed to be repaired and recycled.
Assessment	<ul style="list-style-type: none"> Continual teacher feedback of practice NEA. Ongoing exam questions through online worksheets. 	<ul style="list-style-type: none"> Continual teacher feedback of practice NEA. Ongoing exam questions through online worksheets. End of unit tests.

YEAR 12	Spring 1 & 2
Topics	<p style="text-align: center;">Architecture Based Project</p> <p style="text-align: center;">A03 - Analyse and Evaluate:</p> <ul style="list-style-type: none"> Design Decisions and Outcomes, including for prototypes made by themselves and others <ul style="list-style-type: none"> Wider Issues in Design and Technology <p style="text-align: center;">A04 - Demonstrate and Apply Knowledge and Understanding of:</p> <ul style="list-style-type: none"> Technical Principles Designing and Making Principles <p style="text-align: center;">Systems Based Project - Lighting Design</p> <p style="text-align: center;">A01 - Identifying and Investigating Design Possibilities to Address Needs and Wants</p> <p style="text-align: center;">A02 - Design and Make Prototypes That Are Fit For Purpose</p>
Substantive Knowledge – The Knowledge Taught By The Teacher	<p>Students will learn about:</p> <ul style="list-style-type: none"> Design development, design development and modelling. Cad drawing skills and techniques. Tolerances and allowances. How critical assessment of products can lead to the development of designs. An understanding of the design, development and manufacture of products to meet specification criteria. How to work with a variety of materials considering aesthetics, ergonomics and anthropometrics. An awareness of health and safety procedures related to products and manufacturing. The concept of 'open design' and be able to provide examples of products. How the choice of materials can have on the use, care and disposal of products. How a product can be designed and manufactured with disassembly in mind. How integral fixings are designed into products to aid disassembly. What steps can be taken to manufacture products sustainably. The implications of waste and energy consumption. What steps can be taken in manufacturing in order to minimise waste and improve

	<p>quality and efficiency.</p> <ul style="list-style-type: none"> • The difference between quality assurance and quality control. • Some systems which are used by manufacturers in order to achieve high quality products. • How materials, parts and products can be tested and inspected in order to achieve agreed standards. • The reasons for national and international standards in product design. • The symbols and codes which are used on products in relation to technical standards, energy use, recycling, disposal and safety.
Disciplinary Knowledge	<ul style="list-style-type: none"> • Specialist tools, equipment, techniques and processes. • Health and Safety. • Manufacturing. • Self-reflection and evaluation of research. • Self-reflection and evaluation of designs. • Reaction to client feedback. • Responding to client feedback to meet their needs. • To investigate possible new processes and technologies. • Understand how products are developed to be inclusive in their design. • Be aware of products that are inclusively designed for a wide range of users. • Explain the importance of environmental issues in design and manufacture and the related responsibilities of designers and manufacturers. • Understand the concept of a circular economy and the application of the life cycle assessment tool.
Skills	<ul style="list-style-type: none"> • Problem solving. • Use of the iterative process to design, test, receive feedback, re-design and re-test. • Persistent referral back to and evaluation against user profiling. • Practical workshop skills. • Practical CAD/CAM skills. • Decision making, which materials and processes best suit the individual project outcome.
Links To Prior Learning	<ul style="list-style-type: none"> • Combining all skills from KS3 and KS4. • Practical use of knowledge from KS4. • Use of workshop tools and equipment. • Modelling quality prototypes reflecting designs. • Manufacturing according to individual designs and plans.
Literacy/ Numeracy	<ul style="list-style-type: none"> • Literacy: ongoing self-reflection and evaluation, the analysis and comprehension of feedback from others. • Numeracy: accuracy of measuring and marking and use of scale and tessellation. Using settings on tools and equipment to work within tolerances. Interpretation of data.
Cross Curricular	<ul style="list-style-type: none"> • Constant referral to SMSC when designing and manufacturing. • Understand the use of symbols and codes which are used on products in relation to technical standards, energy use, recycling, disposal and safety. • Explain the implications of waste and energy consumption. • Understand what steps can be taken in manufacturing in order to minimise waste and improve quality and efficiency.
	<ul style="list-style-type: none"> • Continual Teacher Feedback of Practice NEA • Ongoing Exam Questions Through Online Worksheets • End of Unit Tests

YEAR 12	Summer 1 & 2
Topics	<p style="text-align: center;">Systems Based Project - Lighting Design</p> <p style="text-align: center;">A03 - Analyse and Evaluate:</p> <ul style="list-style-type: none"> • Design decisions and outcomes, including for prototypes made by themselves and others <ul style="list-style-type: none"> • Wider issues in design & technology <p style="text-align: center;">A04 – Demonstrate and apply knowledge and understanding of:</p> <ul style="list-style-type: none"> • Technical principles • Designing and making principles
Substantive Knowledge – The Knowledge Taught By The Teacher	<p>Students will learn how to:</p> <ul style="list-style-type: none"> • Develop an awareness of what feasibility studies are. • Calculate product cost and profits. • Select appropriate techniques for describing data, ideas and intentions to others. • Explain how feasibility studies are used when planning for product production • Interpret and communicate statistical data. • Analyse data and apply it to a design. • Recognise how prototypes are used to test proposed products with potential consumers. • Describe how collaborative working is used in product development. • Describe how to conduct a feasibility study. • Accurately calculate the cost of a product and profits. • Name, recognise and characterise different types of papers and board. • Describe the main performance characteristics of papers and boards. • Understand the physical and working properties of the paper and board categories and how these affect their performance. • Identify the primary sources of materials for producing paper and board and explain the conversion process. • Demonstrate an awareness of how different properties of papers and board make them suitable for use in commercial products. • Explain the properties of papers and board can be modified by the use of additives in during manufacture. • Understand that papers and board are available in standard forms, weights and sizes. • Cut, crease, score and fold card. • Use school-based cutting and scoring techniques, safely using tools and equipment. • Understand the application of surface treatments and finishes can enhance the functional and aesthetic properties of paper and board products. • Demonstrate the different properties of papers and board make them suitable for use in commercial products. • Explain commercial die cutting process used for cutting, forming and processing paper and board products. • Appreciate the commercially produced paper and board products and processing techniques including lamination, foil lined board and moulded paper pulp. • Articulate clearly, the ecological issues in the manufacture and recycling of complex paper and board products. • Explain how different the properties of papers and board can be commercially adapted to suit specific needs.

Disciplinary Knowledge – How The Knowledge Will Be Developed & Applied	<ul style="list-style-type: none"> • Discuss the ecological issues in the manufacture and recycling of paper and board products. • Identify some of the ecological issues in the manufacture and recycling of paper and board products. • Demonstrate how different communication techniques are used in the design process to convey data and present proposals and intentions to others. • Evaluate how data has been presented and whether or not it has been represented fairly. • Explain how different communication techniques are used in the design process to convey data and present proposals and intentions to others. • Explain how marketing, branding and packaging are used when running an enterprise. • Recognise the importance of corporate identity and consumer identification. • Explain the terms marketing, branding, consumer identity and corporate identity. • Be aware of the role of entrepreneurs.
Skills	<ul style="list-style-type: none"> • Problem solving. • Use of the iterative process to design, test, receive feedback, re-design and re-test. • Persistent referral back to and evaluation against user profiling. • Practical workshop skills. • Practical CAD/CAM skills. • Decision making, which materials and processes best suit the individual project outcome.
Links To Prior Learning	<ul style="list-style-type: none"> • Combining all skills from KS3 and KS4. • Practical use of knowledge from KS4. • Use of workshop tools and equipment. • Modelling quality prototypes reflecting designs.
Literacy/ Numeracy	<ul style="list-style-type: none"> • Literacy: ongoing self-reflection and evaluation, the analysis and comprehension of feedback from others. • Numeracy: accuracy of measuring and marking and use of scale and tessellation. Using settings on tools and equipment to work within tolerances. Calculation, display and interpretation of data.
Cross Curricular	<ul style="list-style-type: none"> • Discuss the ecological issues in the manufacture and recycling of paper and board products. • Identify some of the ecological issues in the manufacture and recycling of paper and board products. • Evaluate how data has been presented and whether or not it has been represented fairly. • Explain how different communication techniques are used in the design process to convey data and present proposals and intentions to others. • Constant referral to SMSC when designing and manufacturing. • Sustainability of materials and lifecycle assessment. • Understanding the sources & origins of timbers and how our choices affect the planet and ecosystems. • Sustainability of materials and lifecycle assessment of a broad range of materials such as wood, metal, plastic, textiles and papers/cards and the impact of their continued production and use on the planet.
Assessment	<ul style="list-style-type: none"> • Continual Teacher Feedback of Practice NEA • Ongoing Exam Questions Through Online Worksheets • End of Unit Tests