Curriculum Map 2021-2022

Subject: Product Design KS4

Year: YEAR 9

YEAR 9	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Content ***Knowledge Prior / recall/ taught***	**Theory Lessons** **Unit 3 - Types and Properties of Materials:** • **Material Properties** • **Papers & Boards** • **Timbers** **Design Project Work** **Pewter casting Project:** • **Key Designers** • **2D Design** ***Prior knowledge from ks3 units. Taught: Knowledge of timbers, plastics and materials theory. Knowledge of the design cycle and the stages involved in researching, designing and making an idea and how to use 2D Design.***	**Theory Lessons** **Unit 3 - Types and Properties of Materials:** • **Metals & Alloys** • **Polymers** • **Textiles** • **Revision & end of unit 3 test** **Design Project Work** **Pewter casting Project: Tools and Processes to support:** • **Pewter Casting, shaping & finishing** • **Vacuum Forming** ***Prior knowledge from ks3 units. Taught: Knowledge of timbers, plastics and materials theory. Knowledge of the design cycle and the stages involved in researching, designing and making an idea and how to use 2D Design.***	**Technical Drawing Unit** • **3rd Angle Orthographic** • **Isometric** • **One Point Perspective** • **Two Point perspective** • **Exploded Drawing** • **British Standard Conventions** ***Prior knowledge from ks3 units. Taught: The basic principles of isometric drawing and how to transform a 2D drawing to a 3D drawing.***	**Theory Lessons** **Unit 2:** • **Mechanical Devices** • **Energy Generation** • **Energy Storage** **Design Project Work** **Cam Toy Project:** • **Types of primary & secondary research** • **How to write a design brief & specification** • **How to produce a range of innovative design ideas.** ***Prior knowledge from ks3 units. Taught: Knowledge of renewable energy sources. Knowledge of the design cycle and the stages involved in researching, designing and making an idea.***	**Theory Lessons** **Unit 2:** • **Electronic Systems** • **Modern Materials** • **Composite materials** • **Technical Textiles** • **Smart Materials** **Design Project Work** **Cam Toy Project:** • **How to develop and refine ideas** • **How to evaluate and improve work** • **Tools and processes used when modelling** ***Prior knowledge from ks3 units. Taught: Knowledge of basic electrical components & soldering. Knowledge of the design cycle and the stages involved in researching, designing an idea.***	**Theory Lessons** **Unit 2:** • **Revision & end of unit 2 test** **Design Project Work** **Cam Toy Project:** • **The tools and processes used in manufacturing a final product** • **How to evaluate projects effectively** ***Prior knowledge from ks3 units. Taught: Knowledge of the design cycle and the stages involved in researching, designing and making an idea.***
Skills **Recall of knowledge and skills will be interleaved throughout**	• Recall techniques and how to apply theory knowledge to exam questions • CAD Skills • Research & Investigation • Design & creativity	• Recall techniques and how to apply theory knowledge to exam questions • Revision & exam practice • Practical Skills, tools and processes	• Drawing & rendering skills • How to use the correct equipment for accurate drawing • Scale & Ratio • CAD Skills • Revision & exam	• Recall techniques and how to apply theory knowledge to exam questions • Research & Investigation • Design & creativity	• Recall techniques and how to apply theory knowledge to exam questions • How to develop and explore ideas • Practical Skills, safe and skillful use of	• Revision & exam practice • Practical Skills, safe and skillful use of tools and processes • Evaluation skills

the SOW		• Evaluation skills	practice		tools and processes	
Key Questions	• How do we describe the properties of materials? • How have key designers shaped the design industry? • What are the advantages and disadvantages of CAD & CAM?	• What is pewter casting and where is this process used in industry? • What is vacuum forming and where is this process used in industry?	• What are working drawings and how are they used in industry? • What are pictorial drawings and why are they needed?	• What are mechanical devices? • How is energy generation and storage changing? • How do you produce innovative and creative designs?	• What are new materials and what impact do they have on design? • How do we explore and develop ideas?	• How do you plan to manufacture efficiently and effectively? • How do you maintain a safe workshop environment?
Assessment	• Theory worksheets & practice exam questions (self & teacher assessment). • End of Unit Theory Test (Teacher assessed) • Assessment of design project work using the AQA NEA assessment criteria(self & teacher assessment).	• Theory worksheets & practice exam questions (self & teacher assessment). • End of Unit Theory Test (Teacher assessed) • Assessment of design project work using the AQA NEA assessment criteria(self & teacher assessment).	• End of unit drawing test / exam style questions (teacher assessed).	• Theory worksheets & practice exam questions (self & teacher assessment). • End of Unit Theory Test (Teacher assessed) • Assessment of design project work using the AQA NEA assessment criteria(self & teacher assessment).	• Theory worksheets & practice exam questions (self & teacher assessment). • End of Unit Theory Test (Teacher assessed) • Assessment of design project work using the AQA NEA assessment criteria(self & teacher assessment).	• Theory worksheets & practice exam questions (self & teacher assessment). • End of Unit Theory Test (Teacher assessed) • Assessment of design project work using the AQA NEA assessment criteria(self & teacher assessment).
Literacy/ numeracy/ SMSC/ Character	• Glossary of key words produced to help describe material properties • Use of coordinates and measuring through CAD	• Keyword definition starters to recap and remember specific new vocabulary related to material properties.	• New key terms introduced to describe drawing techniques e.g. horizon. • Measuring, scale and ratio used in orthographic drawing	• Calculating mechanical advantage and velocity ratio through ratio, percentages and fractions. • Researching and understanding the needs and wants of a specific customer.	• Considering the social needs of your customer when designing.	• Practicing extended writing through evaluation and how to structure an evaluation. • Math skills assessed through the end of unit & year test.
Enrichment opportunities and futures	Relevant industry media programmes such as Grand Designs,	Understanding differing careers you can access: Engineering, Product or Industrial Designer,	Understanding differing careers you can access: Theatre Set Designer, Manufacturer, Machine	Employability Skills - Planning, Fine Motor Skills, Creativity,	Extra practical sessions held outside of class time to allow access to more equipment.	Extra practical sessions held outside of class time to allow access to more equipment.

	100K House, The Big Life Fix.	Interior Designer, Retail Designer, Exhibition Designer, Film Set Designer, Automobile Designers,	Operator, Architect, Exhibition Designer, Toy Designers, Game Designer, Furniture Designer,	Organisation, Critical and Logical Thinking, Problem Solving, Risk Awareness		
Year 10	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Content: **Knowledge:**	**<u>Theory Lessons</u>** **Unit 1 - New 7 Emerging Technology** • **Industry e.g. automation** • **Enterprise e.g. crowdfunding** • **Social & environmental responsibility** • **Production Techniques** **<u>Design Project Work</u>** **Children's Learning & Play Practice NEA:** • **Primary & Secondary Research** • **Ergonomics & Anthropometrics** • **Iterative Process** ***Prior knowledge from ks3 units: knowledge of the design cycle and the stages involved in researching; product analysis & mood boards.***	**<u>Theory Lessons</u>** **Unit 4 - Specialist Knowledge: Timbers** • **Sources & Environmental factors.** • **Properties & uses of timber** • **Conversion & Stock Forms** **<u>Design Project Work</u>** **Children's Learning & Play Practice NEA:** • **Client Analysis & Profile** • **Identifying design possibilities** • **How to write a design brief & specification** ***Prior knowledge from ks3 units: knowledge of the design cycle and the stages involved in researching; writing questionnaires & design specifications***	**<u>Theory Lessons</u>** **Unit 4 - Specialist Knowledge: Timbers** • **Working with timbers; joints, tools and processes used** • **Commercial processes** • **Tolerances and quality control** **<u>Design Project Work</u>** **Children's Learning & Play Practice NEA:** • **Learning about different design strategies used to produce innovative ideas.** • **Development and modelling techniques** • **Research the social & economic issues related to products** ***Prior knowledge from ks3 units: drawing and design skills.***	**<u>Theory Lessons</u>** **Unit 4 - Specialist Knowledge: Timbers** • **Wood finishes** • **Scales of production** • **End of unit 4 test** **<u>Design Project Work</u>** **Children's Learning & Play Practice NEA:** • **How to plan for manufacture** • **Materials research** • **Producing working drawings & cutting lists** ***Prior knowledge from ks3 units: knowledge of materials, joining methods and practical processes.***	**<u>Theory Lessons</u>** **Unit 5 - Specialist Knowledge: Polymers** • **Sources & Environmental factors.** • **Properties & uses** • **Stock Forms** • **Industrial Processes** **<u>Design Project Work</u>** **Children's Learning & Play Practice NEA:** • **The tools and processes used in manufacturing a final product** ***Prior knowledge from ks3 units: knowledge of materials, joining methods and practical processes.***	**<u>Theory Lessons</u>** **Unit 5 - Specialist Knowledge: Polymers** • **Selection of materials forces & stresses** • **End of unit 5 test** **<u>Design Project Work</u>** **Children's Learning & Play Practice NEA:** • **Evaluation & testing of products** **<u>Yr10 Mock Exams</u>** **Full 2hr paper assessing all areas of theory** **<u>GCSE NEA</u>** **Contexts for the NEA (Non-Examined Assessment) are released for students to research and review over the summer.** ***Prior knowledge from ks3 units: evaluation & research skills.***
Skills **Recall of knowledge and skills will be interleaved throughout the**	• Recall techniques and how to apply theory knowledge to exam questions • Research & Investigation skills; how to analyse and	• Recall techniques and how to apply theory knowledge to exam questions • Research & Investigation skills; how to analyse and	• Recall techniques and how to apply theory knowledge to exam questions • Drawing skills using both 2D & 3D drawing techniques	• Recall techniques and how to apply theory knowledge to exam questions • Drawing skills using both 2D & 3D drawing techniques	• Recall techniques and how to apply theory knowledge to exam questions • Practical Skills, safe and skillful use of tools and processes	• Recall techniques and how to apply theory knowledge to exam questions • How to structure evaluations • Research &

SOW	select useful information.	select useful information.	• Research & Investigation skills; how to analyse and select useful information.	• Research & Investigation skills; how to analyse and select useful information.		Investigation skills; how to analyse and select useful information.
Key Question	• What is the impact of new and emerging technology on the design & manufacturing industry? • What is the iterative process and why is it so important?	• What is a life cycle assessment and why do designers need to use them? • How does the brief and specification inform the design?	• What tools. Equipment and processes are used in the production of wooden products? • What are the different design strategies and how are they used to produce innovative ideas?	• Why does the volume of a product influence the way it is made? • Why is planning an essential part of the manufacturing process?	• Where do polymers come from, how are they produced? • What is the impact of polymers on the environment? • How do we use the laser cutter?	• How are materials selected for use? • What is the NEA and how does it effect my final grade?
Assessment	• Theory worksheets & practice exam questions (self & teacher assessment). • End of Unit Test (Teacher assessed) • Assessment of design project work using the AQA NEA assessment criteria(self & teacher assessment).	• Theory worksheets & practice exam questions (self & teacher assessment). • Assessment of design project work using the AQA NEA assessment criteria(self & teacher assessment).	• Theory worksheets & practice exam questions (self & teacher assessment). • Assessment of design project work using the AQA NEA assessment criteria(self & teacher assessment).	• Theory worksheets & practice exam questions (self & teacher assessment). • End of Unit Test (Teacher assessed) • Assessment of design project work using the AQA NEA assessment criteria(self & teacher assessment).	• Theory worksheets & practice exam questions (self & teacher assessment). • Assessment of design project work using the AQA NEA assessment criteria(self & teacher assessment).	• End of Unit Theory Test (Teacher assessed) • Yr10 full mock exam (teacher assessed) • Assessment of design project work using the AQA NEA assessment criteria(self & teacher assessment).
Literacy/numeracy/SMSC/ Character	• Glossary of key words produced to help understand technical terms • How to analyse data and summarise in a paragraph using the PEEL structure. • Analysing data, bell curves and percentiles in anthropometric data.	• How to structure more extended exam questions • Analysis of questionnaire data, the types and production of a range of graphs. • Researching and understanding the needs and wants of a specific customer.	• Measuring & scale used in the production of models • Research into the social and economic impact their design many have.	• Producing technical drawings to scale and with accurate measurements • Producing an accurate cutting list with the precise measurements of all materials required.	• Accurate measuring skills through practical work. • Calculation of quantities of materials and sizes through stock forms. • Geometry & trigonometry through calculating material sizes from stock forms • Tessellation	• Practicing extended writing through evaluation and how to structure an evaluation. • Math skills assessed through the end of unit & year test.

Enrichment opportunities and futures	Weekly NEA drop-in sessions to support coursework.	Weekly NEA drop-in sessions to support coursework.	Weekly NEA drop-in sessions to support coursework.	Trip & workshop at the Design Museum. Weekly NEA drop-in sessions to support coursework.	Weekly NEA drop-in sessions to support coursework.	Weekly NEA drop-in sessions to support coursework.
YEAR 11	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Content ***Knowledge***	**<u>Theory Lessons</u>** **Revision:** ● **Unit 1** ● **Unit 2** ● **Unit 3** **<u>NEA</u>** **Students select a context and through the design process, produce their own product.** ● **Investigation & Research** ● **Design Brief** ● **Specification**	**<u>Theory Lessons</u>** **Revision:** ● **Unit 4: Timbers** ● **Unit 5: Polymers** ● **Mock exam technique** **<u>NEA</u>** **Students select a context and through the design process, produce their own product.** ● **Design Ideas** ● **Design Development & Modelling**	**<u>Theory Lessons</u>** **Revision:** ● **Unit 6: Design & Make Theory** ● **Technical Drawing** **<u>NEA</u>** **Students select a context and through the design process, produce their own product.** ● **Planning for manufacture** ● **Materials research** ● **Producing working drawings & cutting lists**	**<u>Theory Lessons</u>** **Revision:** ● **Students & Teachers to identify areas of weakness and review the theory units again** **<u>NEA</u>** **Students select a context and through the design process, produce their own product.** ● **Manufacture of products** ● **Final Evaluation**	**<u>Theory Lessons</u>** **Revision:** ● **Feedback from mocks. Revision dependent on feedback**. **<u>NEA</u>** **Final NEA deadline - 1st week after Easter Holidays.**	
Skills **Recall of knowledge and skills will be interleaved throughout the SOW**	● Recall techniques and how to apply theory knowledge to exam questions ● Research & Investigation skills; how to analyse and select useful information.	● Recall techniques and how to apply theory knowledge to exam questions ● Drawing & design skills	● Recall techniques and how to apply theory knowledge to exam questions ● Drawing skills using both 2D & 3D drawing techniques ● Planning skills	● Recall techniques and how to apply theory knowledge to exam questions ● Practical Skills, safe and skillful use of tools and processes	● Recall techniques and how to apply theory knowledge to exam questions ● Exam technique	.
Key Question	● How does Section A look on the exam, what is the content, and how do I make the most of it? ● How much is section A worth? ● What revision techniques should I be using for Section	● How does Section B look on the exam, what is the content, and how do I make the most of it? ● How much is section B worth? ● What do I need to do if a question asks me to use notes and	● How does Section C look on the exam, what is the content, and how do I make the most of it? ● How much is section C worth? ● What revision techniques should I be using for Section	● What areas of revision should I focus on? ● What revision techniques should I be using?	● What areas of revision should I focus on? ● What revision techniques should I be using?	

	A?	sketches in my answer?	C?			
Assessment	• Revision worksheets & practice exam questions (self & teacher assessment). • Assessment of design project work using the AQA NEA assessment criteria(self assessment).	• Mock exam - full 2hr paper (teacher assessment) • Assessment of design project work using the AQA NEA assessment criteria(self assessment).	• Revision worksheets & practice exam questions (self & teacher assessment). • Assessment of design project work using the AQA NEA assessment criteria(self assessment).	• Revision worksheets & practice exam questions (self & teacher assessment). • Assessment of design project work using the AQA NEA assessment criteria(self assessment).	• Revision worksheets & practice exam questions (self & teacher assessment). • Final teacher assessment of NEA then sent to be externally moderated.	
Literacy/numeracy/SMSC/ Character	• Use of key technical vocabulary supported by glossaries • Raised awareness of SMSC issues through research into potential clients and products.	• Exam technique; how to structure 10 mark questions.	• Maths revision through design & make theory covering, handling data, graphs, geometry, trigonometry , measuring, area, volume, scale & ratio.	• Use of key technical vocabulary supported by glossaries • Exam technique; paragraph structure	• Use of key technical vocabulary supported by glossaries • Exam technique; paragraph structure	
Enrichment opportunities and futures	Weekly NEA drop-in sessions to support coursework.	Weekly NEA drop-in sessions to support coursework.	Weekly NEA drop-in sessions to support coursework.	Weekly NEA drop-in sessions to support coursework.	Weekly revision sessions after school. .	