

# Curriculum Overview 2024-25 KS4 GCSE Design and Technology (8552)

Curriculum overview for Year 10

TERM	Autumn HT 1	Autumn HT 2	Spring HT 1	Spring HT 2	Summer HT 1	Summer HT 2
<p><b>Curriculum Content:</b></p> <p>Priority Essential knowledge and skills that will be taught.</p>	<p>Specialist techniques and processes; timber categories, properties, and applications; communicating and recording ideas</p> <p><b>Prior Learning:</b></p> <ul style="list-style-type: none"> <li>• Know how to select and safely and independently use basic techniques, processes, and tools to shape, fabricate, construct, and assemble components and products</li> <li>• Know how to use lines, reference point, templates and basic marking-out equipment</li> </ul>	<p>Timber specialist technical principles; material categories, properties, and applications; forces and stresses; enhancing materials; communicating and recording ideas</p> <p><b>Prior Learning:</b></p> <ul style="list-style-type: none"> <li>• Know how to produce a basic perspective drawing</li> </ul>	<p>Mock NEA project: Investigation, Research, Design and Development</p> <p><b>Prior Learning:</b></p> <ul style="list-style-type: none"> <li>• Know how to carry-out basic investigations and identify problems and needs</li> <li>• Know how to write a basic design specification</li> <li>• Know how to use basic design strategies to generate creative design ideas</li> <li>• Know how to make a model of an idea using cardboard</li> </ul>	<p>Mock NEA Project: Development and Realisation</p> <p><b>Prior Learning:</b></p> <ul style="list-style-type: none"> <li>• Know how to produce a basic scale 1:2 orthographic drawing by hand</li> <li>• Know how to produce a 3D CAD image of a design</li> <li>• Know how to produce an exploded view of a product</li> <li>• Know how to produce a prototype in response to basic</li> </ul>	<p>Mock NEA Project: Realisation and Evaluation; developments made in materials; new technologies; environmental, social, and economic challenges</p> <p><b>Prior Learning:</b></p> <ul style="list-style-type: none"> <li>• Know how to use specialist techniques and processes to safely shape, fabricate, construct, and assemble a high-quality prototype, (abrasive, wastage, cutting, drilling, shaping, additive, deforming, reforming, and finishing processes)</li> <li>• Know how to manage materials:</li> </ul>	<p>Scales of production; selecting materials and components; NEA: Section A - Identifying and Investigating Design Possibilities</p> <p><b>Prior Learning:</b></p> <ul style="list-style-type: none"> <li>• Know the physical and working properties of materials</li> <li>• Know how to carry out detailed investigations to identify problems and needs</li> <li>• Know how to gather primary and secondary data to understand client and/or user needs – market research, product analysis,</li> </ul>

	<ul style="list-style-type: none"> <li>• Know how to produce isometric drawings of basic shapes, components and assemblies</li> </ul>			<p>client needs and wants</p> <ul style="list-style-type: none"> <li>• Know how to use specialist techniques and processes to safely shape, fabricate, construct, and assemble a high-quality prototype, (abrasive, wastage, cutting, drilling, shaping, additive, deforming, reforming, and finishing processes)</li> <li>• Know how to manage materials: cutting materials efficiently to minimise waste; using marking-out methods such as reference points, lines, and surfaces; templates, and/or patterns</li> <li>• Know how to work accurately using tolerances and production aids such as jigs</li> </ul>	<p>cutting materials efficiently to minimise waste; using marking-out methods such as reference points, lines, and surfaces; templates, and/or patterns</p> <ul style="list-style-type: none"> <li>• Know how to work accurately using tolerances and production aids such as jigs</li> <li>• Know how to apply surface treatments and finishes for functional and aesthetic purposes</li> <li>• Know how to conduct a basic evaluation of a product identifying success and areas for development</li> </ul>	<p>ergonomics, anthropometrics, and use of percentiles</p>
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	<p><b>Key Knowledge:</b></p> <ul style="list-style-type: none"> <li>• Selecting specialist techniques, processes, hand tools, and machinery appropriate for materials and tasks to complete quality outcomes.</li> <li>• How to use specialist techniques and processes to safely shape, fabricate, construct, and assemble a high-quality prototype, (abrasive, wastage, cutting, drilling, shaping, additive, deforming, reforming, and finishing processes)</li> <li>• Materials management: cutting materials efficiently to minimise waste; using marking-out methods such as reference points, lines, and surfaces; templates, and/or patterns</li> </ul>	<p><b>Key Knowledge:</b></p> <ul style="list-style-type: none"> <li>• Timbers - stock form types and sizes</li> <li>• Timbers - standard components</li> <li>• Timber - sources, origins, and conversion processes</li> <li>• Polymers, metals, textiles, papers, and boards - categories, sources, types, properties, and applications.</li> <li>• Composite materials: glass reinforced plastic (GRP) and carbon-fibre reinforced plastic (CRP).</li> <li>• Forces and stresses which materials and objects can be manipulated to resist</li> <li>• Methods of enhancing materials to resist and work with forces and stresses to improve functionality</li> <li>• Developing, communicating, and recording design</li> </ul>	<p><b>Key Knowledge:</b></p> <ul style="list-style-type: none"> <li>• Carrying out detailed investigations to identify problems and needs</li> <li>• Use of primary and secondary data to understand client and/or user needs – market research, product analysis, ergonomics, anthropometrics, and use of percentiles</li> <li>• Writing a design brief and producing a detailed, justified and evidence-based design specification</li> <li>• Generating imaginative and creative design ideas using a range of different iterative design strategies</li> <li>• Exploring, developing, recording, and justifying design ideas using sketching, modelling, testing</li> </ul>	<p><b>Key Knowledge:</b></p> <ul style="list-style-type: none"> <li>• Developing, communicating, recording, and justifying design ideas using a range of appropriate techniques – orthographic drawings, exploded views, schematic diagrams, and CAD</li> <li>• Developing a prototype in response to client needs and wants</li> <li>• Selecting specialist techniques, processes, hand tools, machinery and CAD CAM equipment appropriate for materials and tasks to complete quality outcomes.</li> <li>• How to use specialist techniques and processes to safely shape, fabricate, construct, and assemble a high-quality prototype, (abrasive, wastage,</li> </ul>	<p><b>Key Knowledge:</b></p> <ul style="list-style-type: none"> <li>• How to use specialist techniques and processes to safely shape, fabricate, construct, and assemble a high-quality prototype, (abrasive, wastage, cutting, drilling, shaping, additive, deforming, reforming, CAM and finishing processes)</li> <li>• Materials management: cutting materials efficiently to minimise waste; using marking-out methods such as reference points, lines, and surfaces; templates, and/or patterns</li> <li>• Working accurately using tolerances and production aids such as jigs</li> <li>• Evaluating prototypes, reflecting critically, responding to feedback,</li> </ul>	<p><b>Key Knowledge:</b></p> <ul style="list-style-type: none"> <li>• Scales of production and how products are produced in different volumes</li> <li>• Selecting materials and components</li> <li>• The properties and characteristics of the materials and components used in commercial products which makes them suitable for a particular scale of manufacture</li> <li>• Carrying out investigations to identify problems and needs</li> <li>• Use of primary and secondary data to understand client and/or user needs – market research, product analysis, ergonomics, anthropometrics, and use of percentiles</li> </ul>
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	<ul style="list-style-type: none"> <li>• Working accurately using tolerances and production aids such as jigs</li> <li>• The application and use of Quality Control during manufacture, including measurable and quantitative systems such as go/no go fixtures</li> <li>• Surface treatments and finishes applied for functional and aesthetic purposes</li> <li>• Physical and working properties of materials</li> <li>• Timbers – categories, sources, types, properties, and applications.</li> <li>• Communicating design ideas using isometric exploded drawings</li> </ul>	<p>ideas using perspective drawings</p>	<p>and ongoing evaluation</p> <ul style="list-style-type: none"> <li>• Developing, communicating, recording, and justifying design ideas and decisions using isometric and perspective, drawings, 3D physical models, and written evaluative techniques</li> <li>• Designing prototypes in response to client wants and needs</li> </ul>	<p>cutting, drilling, shaping, additive, deforming, reforming, CAM and finishing processes)</p> <ul style="list-style-type: none"> <li>• Materials management: cutting materials efficiently to minimise waste; using marking-out methods such as reference points, lines, and surfaces; templates, and/or patterns</li> <li>• Working accurately using tolerances and production aids such as jigs</li> </ul>	<p>suggesting improvements, assessing if prototypes are fit for purpose</p> <ul style="list-style-type: none"> <li>• Developments made in materials - modern materials, and smart materials</li> <li>• Impact of new and emerging technologies on contemporary and potential future scenarios in relation to industry, enterprise, sustainability, people, culture, society, the environment, and production techniques and systems</li> <li>• Critical evaluation of new and emerging technologies</li> <li>• Ecological and social issues in the design and manufacture of products</li> <li>• Environmental, social, and economic challenges</li> </ul>	
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	<p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>• Be able to select and safely use specialist techniques, processes, hand tools, and machinery (abrasive, wastage, cutting, drilling, shaping, additive, deforming, reforming, and finishing processes) appropriate for materials and tasks to shape, fabricate, construct, and assemble a high-quality prototype and be able to name, explain, describe, and evaluate those techniques</li> <li>• Be able to cut materials efficiently to minimise waste using marking-out techniques such as templates to assist, and be able to name, explain, describe, and evaluate techniques</li> <li>• Be able to work to a tolerance, using</li> </ul>	<p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>• Be able to name, describe select ad justify the use of stock forms and sizes of timber and standard timber components</li> <li>• Be able to name, describe and explain timber sources, origins, and conversion processes</li> <li>• Be able to name, describe, explain and evaluate the different types of, properties of, and applications of composite material materials</li> <li>• Be able to name, describe and explain five types of force or stress which materials and objects can be manipulated to resist</li> <li>• Be able to describe, explain and evaluate how timbers can be reinforced through lamination and how</li> </ul>	<p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>• Be able to identify and carry-out investigations into design problems and needs</li> <li>• Be able to carry-out research gathering primary and secondary data from: analytical processes; client interviews; anthropometric research; and product analysis, which informs the design process</li> <li>• Be able to write a design brief and design specification</li> <li>• Be able to use a range of strategies to generate imaginative, creative, and innovative ideas which avoid design fixation</li> <li>• Be able to develop, communicate and record design ideas using perspective sketches, 3D</li> </ul>	<p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>• Be able to develop, communicate and record design ideas using orthographic and exploded view drawings, schematic plans, and CAD</li> <li>• Be able to design and develop a prototype which satisfies the requirements of the brief; responds to the client’s needs and wants; demonstrates innovation; is functional; aesthetically pleasing; and potentially marketable</li> <li>• Be able to select and safely use specialist techniques, processes, hand tools, and machinery (abrasive, wastage, cutting, drilling, shaping, additive, deforming, reforming, and finishing processes) appropriate for</li> </ul>	<p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>• Be able to select and safely use specialist techniques, processes, hand tools, and machinery (abrasive, wastage, cutting, drilling, shaping, additive, deforming, reforming, and finishing processes) appropriate for materials and tasks to shape, fabricate, construct, and assemble a high-quality prototype and be able to name, explain, describe, and evaluate those techniques</li> <li>• Be able to cut materials efficiently to minimise waste using marking-out techniques such as templates to assist, and be able to name, explain, describe, and evaluate techniques</li> <li>• Be able to work to a tolerance, using</li> </ul>	<p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>• Be able to name, describe, explain, and evaluate each of the four scales of production</li> <li>• Be able to identify, explain and evaluate factors which impact the selection of materials.</li> <li>• Be able to describe, explain, and evaluate the relationship between the characteristics of the materials and components used in commercial products and the scale of production at which they are manufactured</li> <li>• Be able to identify and carry-out investigations into design problems and needs</li> <li>• Be able to carry-out research gathering primary and secondary data</li> </ul>
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	<p>production aids such as jigs, to achieve a high level of accuracy and be able to name, explain, describe, evaluate and design production aids</p> <ul style="list-style-type: none"> <li>• Apply the principles of QC during the manufacturing process, using systems such as go/no go fixtures and be able to name, explain, describe, and evaluate QC systems</li> <li>• Be able to select and apply appropriate surface treatments and finishes to enhance functional and aesthetic performance</li> <li>• Be able to name, describe, and explain different types of material working and physical properties</li> <li>• Be able to name, categorise, describe, and explain the</li> </ul>	<p>concrete can be reinforced through the addition of rebar</p> <ul style="list-style-type: none"> <li>• Be able to communicate design ideas using perspective drawings based upon information included in partially complete images and orthographic drawings</li> </ul>	<p>physical models and written form</p> <ul style="list-style-type: none"> <li>• Be able to work directly with materials such as card and Styrofoam to produce models of developmental design iterations and be able to explain the benefits of modelling design concepts</li> </ul>	<p>materials and tasks to shape, fabricate, construct, and assemble a high-quality prototype and be able to name, explain, describe, and evaluate those techniques</p> <ul style="list-style-type: none"> <li>• Be able to cut materials efficiently to minimise waste using marking-out techniques such as templates to assist, and be able to name, explain, describe, and evaluate techniques</li> <li>• Be able to work to a tolerance, using production aids such as jigs, to achieve a high level of accuracy and be able to name, explain, describe, evaluate and design production aids</li> <li>• Apply the principles of QC during the manufacturing process using systems such as</li> </ul>	<p>production aids such as jigs, to achieve a high level of accuracy and be able to name, explain, describe, evaluate and design production aids</p> <ul style="list-style-type: none"> <li>• Apply the principles of QC during the manufacturing process using systems such as go/no go fixtures and be able to name, explain, describe, and evaluate those principles</li> <li>• Be able to evaluate a prototype, reflect critically to feedback, suggesting improvements and assess if a prototype is fit for purpose</li> <li>• Be able to name, describe, explain and evaluate the different types of, properties of, and applications of modern materials,</li> </ul>	<p>from: analytical processes; client interviews; anthropometric research; and product analysis, which informs the design process</p>
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	<p>properties of common timbers</p> <ul style="list-style-type: none"> <li>• Be able to communicate designs using isometric exploded drawings</li> </ul> <p><b>Future links:</b></p> <ul style="list-style-type: none"> <li>• Apply knowledge and skills in 'Mini NEA' (Y10 HT 3, 4 and 5) and NEA (Y11 HT2 and 3) and final examination.</li> </ul>	<p><b>Future links:</b></p> <ul style="list-style-type: none"> <li>• Apply knowledge and skills in 'Mini NEA' (Y10 HT3 and 4) and NEA (Y11 HT1 and 2) and final examination.</li> </ul>	<p><b>Future links:</b></p> <ul style="list-style-type: none"> <li>• Apply knowledge and skills in NEA (Y11 HT1 and 2) and final examination.</li> </ul>	<p>go/no go fixtures and be able to name, explain, describe, and evaluate those principles</p> <p><b>Future links:</b></p> <ul style="list-style-type: none"> <li>• Apply knowledge and skills in NEA (Y11 HT1, 2 and 3) and final examination.</li> </ul>	<p>technical textiles and smart materials</p> <ul style="list-style-type: none"> <li>• Be able to describe, explain and evaluate the impact of new technologies on industry, sustainability, enterprise, people, culture, society, the environment, and production techniques and systems</li> <li>• Be able to critically evaluate new and emerging technologies</li> <li>• Be able to name, describe, explain, and evaluate a range of environmental, social, and economic issues, challenges, and solutions</li> </ul> <p><b>Future links:</b></p> <ul style="list-style-type: none"> <li>• Apply knowledge and skills in NEA (Y11 HT1, 2 and 3) and final examination.</li> </ul>	<p><b>Future links:</b></p> <ul style="list-style-type: none"> <li>• Apply knowledge and skills in NEA (Y11 HT1, 2 and 3) and final examination.</li> </ul>
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Assessment	Interim Assessment 1:	Interim Assessment 2:	Interim Assessment 3:	Interim Assessment 4:	Interim assessment 5:	Interim Assessment 6:
	<p>Theoretical knowledge assessed through mini exam. HT1 topics: specialist techniques and processes; production aids; tolerances; QC; materials management; sources, categories, properties and applications of timbers; isometric and exploded view drawings</p>	<p>Theoretical knowledge assessed through mini exam. HT2 topics: timbers - stock form types and sizes; timbers - standard components; timber - sources, origins, and conversion processes; sources, categories, properties and applications of polymers, timbers, textiles and composite materials; forces and stresses; methods of enhancing materials to resist and work with forces and stresses to improve functionality; perspective drawings; and all topics from HT1 (cumulative testing, promoting recall and application of knowledge in different contexts/types of question).</p>	<p>Assessment of mock NEA project Sections A, B and C using exam board success criteria (investigating and identifying problems and needs; writing a design brief and specification; generating design ideas)</p> <p>Theoretical knowledge assessed through mini exam. HT3 topics: ergonomics; anthropometrics; client needs; design strategies; and all topics from HT1 and HT2 (cumulative testing, promoting recall and application of knowledge in different contexts/types of question).</p>	<p>Assessment of mock NEA project Section D using exam board success criteria (developing design ideas)</p> <p>Theoretical knowledge assessed through mini exam. All topics taught in HT1, HT2 and HT3 (cumulative testing, promoting recall and application of knowledge in different contexts/types of question).</p>	<p>Assessment of mock NEA project Sections E and F using exam board success criteria (realising ideas and evaluating)</p> <p>Theoretical knowledge assessed through mini exam. HT4 topics: modern and smart materials; Impact of new and emerging technologies on contemporary and potential future scenarios in relation to industry, enterprise, sustainability, people, culture, society, the environment, and production techniques and systems; critical evaluation of new and emerging technologies; ecological and social issues in the design and manufacture of products and environmental, social, and economic challenges; and all</p>	<p>Mock GCSE exam paper on all topics taught Y10</p>





					topics taught in HT1, HT2 and HT3 (cumulative testing, promoting recall and application of knowledge in different contexts/types of question).	
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Curriculum overview for Year 11

TERM	Autumn HT 1	Autumn HT 2	Spring HT 1	Spring HT 2	Summer HT 1	Summer HT 2
<p><b>Curriculum Content:</b></p> <p><b>Priority Essential knowledge and skills that will be taught.</b></p>	<p><b>NEA Sections A, B, C and D</b></p> <p><b>Prior Learning:</b></p> <ul style="list-style-type: none"> <li>• Carrying out detailed investigations to identify problems and needs</li> <li>• Use of primary and secondary data to understand client and/or user needs – market research, product analysis, ergonomics, anthropometrics, and use of percentiles</li> <li>• Writing a design brief and producing a detailed, justified and evidence-based design specification</li> <li>• Generating imaginative and creative design ideas using a range of different iterative design strategies</li> <li>• Exploring, developing,</li> </ul>	<p><b>NEA Sections D and E</b></p> <p><b>Prior Learning:</b></p> <ul style="list-style-type: none"> <li>• Developing, communicating, recording, and justifying design ideas using a range of appropriate techniques – orthographic drawings, exploded views, schematic diagrams, and CAD</li> <li>• Developing a prototype in response to client needs and wants</li> <li>• Selecting specialist techniques, processes, hand tools, machinery and CAD CAM equipment appropriate for materials and tasks to complete quality outcomes.</li> <li>• How to use specialist techniques and processes to</li> </ul>	<p><b>NEA Sections E and F</b></p> <p><b>Prior Learning:</b></p> <ul style="list-style-type: none"> <li>• Evaluating prototypes, reflecting critically, responding to feedback, suggesting improvements, assessing if prototypes are fit for purpose</li> <li>• How to use specialist techniques and processes to safely shape, fabricate, construct, and assemble a high-quality prototype, (abrasive, wastage, cutting, drilling, shaping, additive, deforming, reforming, CAM and finishing processes)</li> <li>• Materials management: cutting materials efficiently to minimise waste; using marking-out</li> </ul>	<p><b>Exam revision and exam preparation</b></p> <p><b>Prior Learning:</b></p> <ul style="list-style-type: none"> <li>• Physical and working properties of materials</li> <li>• Categories, sources, types, properties, and applications of materials: timbers, polymers, metals and composites</li> <li>• Forces and stresses</li> <li>• Selecting materials</li> <li>• Sustainability, ecological and social footprint, environmental challenge</li> <li>• Sources and origins</li> <li>• Specialist techniques and processes</li> <li>• Scales of Production</li> <li>• Communicating ideas</li> <li>• Materials management</li> </ul>	<p><b>Exam revision and exam preparation</b></p> <p><b>Prior Learning:</b></p> <ul style="list-style-type: none"> <li>• Ecological and social foot-print and environmental, social, and economic challenge</li> <li>• Specialist techniques and processes Work of others</li> <li>• Investigating, primary and secondary data including human factors and maths link - frequency tables; presentation of client survey response; percentiles ranges used in anthropometrics</li> <li>• Communicating ideas – formal isometric and orthographic drawings including maths link – use of dimensions, scale-</li> </ul>	

	<p>recording, and justifying design ideas using sketching, modelling, testing and ongoing evaluation</p> <ul style="list-style-type: none"> <li>• Developing, communicating, recording, and justifying design ideas and decisions using isometric and perspective, drawings, 3D physical models, and written evaluative techniques</li> <li>• Developing, communicating, recording, and justifying design ideas using a range of appropriate techniques – orthographic drawings, exploded views, schematic diagrams, and CAD</li> <li>• Designing prototypes in response to client wants and needs</li> </ul>	<p>safely shape, fabricate, construct, and assemble a high-quality prototype, (abrasive, wastage, cutting, drilling, shaping, additive, deforming, reforming, CAM and finishing processes)</p> <ul style="list-style-type: none"> <li>• Materials management: cutting materials efficiently to minimise waste; using marking-out methods such as reference points, lines, and surfaces; templates, and/or patterns</li> <li>• Working accurately using tolerances and production aids such as jigs</li> </ul>	<p>methods such as reference points, lines, and surfaces; templates, and/or patterns</p> <ul style="list-style-type: none"> <li>• Working accurately using tolerances and production aids such as jigs</li> </ul>		<p>drawing, and projections</p> <ul style="list-style-type: none"> <li>• Materials management including maths link - expression in decimal and standard form e.g. calculation of required materials; calculate surface area and volume; angular measures; SI units; and the use of reference datum points and coordinates</li> <li>• Tolerances, production aids, materials management, and QC including maths link – use of dimensions e.g. +/- 2mm</li> </ul>	
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	<p><b>Assessment Tasks:</b> NEA Section A - Investigating and Identifying Design Possibilities NEA Section B – producing a design brief and specification NEA Section C – generating design ideas</p>	<p><b>Assessment Tasks:</b> NEA Section D – developing design ideas NEA Section E – realising design ideas</p>	<p><b>Assessment Tasks:</b> NEA Section E – realising design ideas NEA Section F – analysing and evaluating</p>	<p><b>Key Knowledge - revision of following topics and development of exam technique:</b></p> <ul style="list-style-type: none"> <li>• Impact of new technologies on industry, enterprise, production systems, techniques, culture and people</li> <li>• Motion and mechanical devices including maths link – ratio, angular measurements, 2D representations of mechanisms/mechanical movement</li> <li>• Material types, categories, properties, and applications</li> <li>• Modern materials, smart materials, and composite materials</li> <li>• Energy generation and storage</li> <li>• Forces, stresses, and reinforcement</li> <li>• Selection of materials including maths link – calculating material costs</li> </ul>	<p><b>Revision of following topics and development of exam technique:</b></p> <ul style="list-style-type: none"> <li>• Ecological and social foot-print and environmental, social, and economic challenge</li> <li>• Specialist techniques and processes Work of others</li> <li>• Investigating, primary and secondary data including human factors and maths link - frequency tables; presentation of client survey response; percentiles ranges used in anthropometrics</li> <li>• Communicating ideas – formal isometric and orthographic drawings including maths link – use of dimensions, scale-drawing, and projections</li> </ul>	
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<b>Assessment</b>	<b>Interim assessment 1:</b> NEA Section A, B and C work assessed against AQA GCSE NEA mark scheme	<b>Interim assessment 2:</b> NEA Section A, B, C and D work assessed against AQA GCSE NEA mark scheme	<b>Interim assessment 3:</b> NEA Section A, B, C, D, E and F work assessed against AQA GCSE NEA mark scheme	<b>Interim assessment 4:</b> Mock GCSE exam paper  <b>Mini assessments:</b> Exam style questions throughout revision	<b>Interim assessment 5:</b> Mini formative assessments (exam style questions) throughout revision	