

## KAT KEY STAGE OVERVIEW (Long Term Planning)



### Year 10 Product Design

Week/ Lesson	Term	Topic	Knowledge	Skills
1	Autumn T1	New and Emerging Technologies	Industrial practises, entrepreneurial activity.  New and emerging technologies, Industry, Automation and robotics, Enterprise, crowdfunding, virtual marketing and retail, co- operatives and fair trade.	<b>Complex activity:</b> <b>Writing genre:</b> Series of related questions to the topic. Key word collation and Disciplinary knowledge. Case study multi touch watch.  Cross curricular link with business.  Examination practise questions.  Practise coursework research task set.
2			Sustainability and the environment.  Sustainability, Life cycle assessment, waste disposal, environment, Continuous improvement, Efficient working, global warming, carbon offsetting	Series of related questions to the topic. Key word collation and Disciplinary knowledge from power points. Case study Biolite. Cross curricular link with Geography  Examination practise questions.  Practise coursework research task set.
3			People culture and society People, consumer choice, technology push, market pull, changing job roles, culture, fashion and trends, faiths and beliefs, society positive and negative aspects of new	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points. Case study £5 note, Puma  Examination practise questions.  Practise coursework research task set.

			products, design for disabled, different religious groups.	
4			<p>Production techniques and systems</p> <p>Automation, computer aided design and manufacturing, flexible manufacturing systems, just in time and lean manufacturing.</p>	<p>Series of related questions to the topic. Key word collation and note taking from power points.</p> <p>Examination practise questions.</p> <p>Practise coursework research task set.</p>
5			<p>Informing design decisions</p> <p>planned obsolescence, design for maintenance, ethics and the environment, end of working life disposal.</p>	<p>Series of related questions to the topic. Key word collation and disciplinary knowledge from power points.</p> <p>Case study mobile technology</p> <p>Examination practise questions.</p> <p>Practise coursework research task set.</p>
6			End of unit assessment	Examination practise.
7		Energy materials systems and devices	<p>Energy Generation and Energy storage</p> <p>turbines and generators, fossil fuels, shale gas, wind turbines, solar energy, tidal energy, hydroelectric power, biofuel, nuclear power.</p> <p>Pneumatics, Hydraulics, kinetic energy, flywheel, batteries,</p>	<p>Series of related questions to the topic. Key word collation and disciplinary knowledge from power points. Numeracy based questions</p> <p>Case study Energy plant</p> <p>Examination practise questions.</p> <p>Practise coursework Initial design concepts..</p>
8			<p>modern and smart materials</p> <p>Corn starch polymers, flexible mdf, titanium, fibre optics, graphene, LCD, Nanomaterials, metal foams, polymorph.</p>	<p>Series of related questions to the topic. Key word collation and disciplinary knowledge from power points.</p> <p>Examination practise questions.</p>

			Thermochromics pigments, Photochromic pigments shape memory alloy, self-healing materials, QTC, Piezoelectric material	Practise coursework Initial design concepts.
9	<b>Autumn T2</b>		Composite materials and technical textiles  Composite materials, technical textiles, Kevlar, Conductive fabrics, fire resistant fabrics, Microfibres,	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points.  Examination practise questions.  Practise coursework Initial design concepts.
10			Systems approach to designing  systems diagrams, open and closed loop system inputs, outputs,	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points. Numeracy based questions  Examination practise questions.  Practise coursework Initial design concepts.
11			Electronic systems processing  Processes, digital and analogue signals, programming microcontrollers, timers, mono stable devices, a stable devices, counters, decision making	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points.  Examination practise questions.  Practise coursework Development of ideas.
12			Mechanical devices  linear, reciprocating, oscillating, rotary motion, levers, changes in magnitude, equilibrium, classes of lever, linkages, cams	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points.  Examination practise questions.

			and followers, gear trains, pulley and belts	Practise coursework development of ideas model creation.
13			End of unit assessment	
14		Materials and their working properties	Papers and boards common papers, common boards	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points.  Examination practise questions.  Practise coursework Sketching and finalising drawings.
15			natural and manufactured timbres  Hardwood, common hardwoods, softwoods, common softwoods and manufactured boards.	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points.  Examination practise questions.  Practise coursework Final model creation
16	<b>Spring T1 Project 2 Food technology</b>		Metal and alloys  Ferrous metals, common ferrous metals, non ferrous metals, common non ferrous metals, alloys.	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points.  Examination practise questions.  Practise coursework Final model creation
17			Polymers  thermoforming, thermosetting plastics, common thermoplastics, common thermosetting plastics	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points.  Examination practise questions.  Practise coursework Final model creation

18			Textiles plant based natural fibres, Animal based natural fibres, Synthetic fibres, blended and mixed fibres, woven textiles, non woven textiles.	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points.  Examination practise questions.  Practise coursework Final model creation
19			End of unit assessment	
20		Common specialist technical principles	Forces and stresses on materials and objects  Tension, Compression, Torsion, Bending, shear.	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points. Numeracy based questions  Examination practise questions.  Practise coursework Final model creation
21		<b>Spring T2</b>	Improving functionality  forces and stresses, strengthening and enhancing materials, reinforcing, webbing, stiffening materials, folding and bending,	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points. Numeracy based questions  Examination practise questions.  Practise coursework Final model creation
22			Ecological and social footprint  Carbon footprint, ecological and social footprint, social footprint, safe working conditions, harvesting raw materials, deforestation, mining, drilling farming, product miles, oceanic pollution, atmospheric pollution	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points.  Examination practise questions.  Practise coursework Final model creation

23			The six rs Refuse, Rethink, Reduce, Reuse, Repair, Recycle	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points.  Examination practise questions.  Practise coursework Evaluation skills
24			Scales of production  One off production, Batch production, Mass and continuous production	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points.  Examination practise questions.  Practise coursework Evaluation skills
25			End of unit assessment	
26		Designing principles	Investigation, primary and secondary data  Primary data sources, secondary data sources, market research, ergonomics, anthropometrics, analysis and presentation of data, design brief, specification	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points.  Examination practise questions.
27	<b>Summer T1</b>		the work of others  Designers and design companies, graphic design, Architecture, product design, industrial design. Companies,	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points.  Examination practise questions.
28			Design Strategies	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points.

			Collaboration, user centered design, systems approach, iterative design.	Examination practise questions.
29			Communication of design ideas and the prototype development  Methods of communication, 2d and 3d sketching and drawing, drawing techniques, Sketching, modelling and testing, annotation, working drawings, mathematical modelling,	Series of related questions to the topic. Key word collation and disciplinary knowledge from power points.  Examination practise questions.
30			End of unit assessment	
31			Isometric projection practise	Series of products to sketch and design
32			Two point perspective and annotated drawing practise.	Finalisation of an idea in 2d and 3d.
33	<b>Summer T2</b>	Coursework	<b>Coursework begins as set by AQA.</b>	
34			<b>Initial research, mood board, mind map</b>	Demonstrate research skills. Be able to show a clear understanding of the brief and be able to create an informed decision. Collating all appropriate information onto a google slide document.
35			<b>Product analysis</b>	Demonstrate research skills. Be able to show a clear understanding of existing products and be able to create an informed decision. Collating all appropriate information onto a google slide document.
36			<b>Client interview</b>	Demonstrate research skills. Be able to show a clear understanding of the client's needs and be able to create an informed decision. Collating all appropriate information onto a google slide document.
37			<b>Work of others</b>	Demonstrate research skills. Be able to show a clear understanding of the work of others and how it can be used to create an informed decision.

				Collating all appropriate information onto a google slide document.
38			<b>Design brief</b>	Demonstrate research skills. Be able to create a clear design brief and be able to create an informed decision. Collating all appropriate information onto a google slide document.
39			<b>Initial concept exploration</b>	Be able to use the research to start to develop initial thoughts that will support the design brief created.
40			<b>Compile and present research</b>	Order and compile research and initial thoughts into a well presented file ready for a final assessment of section one.

## Year 11 Product Design

Week/ Lesson	Term	Topic	Knowledge	Skills  Complex activity: Writing genre:
1	<b>Autumn T1</b>  <b>Project 1</b>	Coursework Design task:  Making principles	Design Brief and specification  Selecting materials and components, Material selection, component selection, Considering functionality, considering availability and cost	Writing a detailed design brief by analysing the research that has been produced. Finalising any outstanding initial research.
2			Completion of the Specification  Tolerances and allowances,	Writing a detailed specification using ACCESS FM as a supporting statement. Analysis of the research will inform a detailed specification.



3			<p>Initial concept creation</p> <p>Material management and marking out, planning, tessellation, measuring units, material requirements, marking out materials, Pattern and grain matching, marking out and cutting tools</p>	<p>Designing ideas with detailed analysis of the concept.</p> <p>Wide range of drawing techniques and model making skills will be shown. Examples may include isometric drawing, two-point perspective, modelling in clay or foam plus CAD ideas.</p>
4			<p>Initial concept creation</p> <p>Specialist tools and equipment, Health and safety information, data sheets, instruction manuals, risk assessment</p>	<p>Designing ideas with detailed analysis of the concept.</p> <p>Wide range of drawing techniques and model making skills will be shown. Examples may include isometric drawing, two-point perspective, modelling in clay or foam plus CAD ideas.</p>
5			<p>Initial concept modelling CAD</p> <p>Surface treatments and finishes, preparation of the surface, Application of the treatments and finishes.</p>	<p>Using CAD software pupils will develop their ideas and show the skills that have been developed in this method of creation.</p>

6			Initial concept modelling Card and foam.	Using modelling materials pupils will produce a concept showing skills in manipulating resistant materials and an accurate use of tools and equipment.
7			Development of concepts	Development of concepts using research, analytical skills and methods of designing to explore the concept fully. Skills demonstrated will include drawing in a range of manners, modelling using a range of physical materials and computer aided manufacturing techniques.
8			Development of concepts	Development of concepts using research, analytical skills and methods of designing to explore the concept fully. Skills demonstrated will include drawing in a range of manners, modelling using a range of physical materials and computer aided manufacturing techniques.
9	<b>Autumn T2</b>		Client feedback	Analytical skills used to create a response from client feedback. Reflection of progress and the planning of the next phase of the coursework.
10			Final developments	Development of concepts using research, analytical skills and methods of designing to explore the concept fully. Skills demonstrated will include drawing in a range of manners, Modelling using a range of physical materials and computer aided manufacturing techniques.
11			Manufacturing specification	Production of a manufacturing specification, created from analysing the results of client feedback and the developments that have been made to the design concept.
12			final concept manufacturing	The production of a final concept using materials and tools selected independently by the pupil. The skills

				shown will be in the physical ability to manipulate materials appropriate to the design concept in an effective and safe manner.
13			Final concept manufacturing	The production of a final concept using materials and tools selected independently by the pupil. The skills shown will be in the physical ability to manipulate materials appropriate to the design concept in an effective and safe manner.
14			Final concept manufacturing	The production of a final concept using materials and tools selected independently by the pupil. The skills shown will be in the physical ability to manipulate materials appropriate to the design concept in an effective and safe manner.
15			Final concept manufacturing	The production of a final concept using materials and tools selected independently by the pupil. The skills shown will be in the physical ability to manipulate materials appropriate to the design concept in an effective and safe manner.
16			Client feedback and evaluation	Analytical skills used to create a response from client feedback. Reflection of progress and the creation of an evaluation.
17			Evaluation and modification.	Evaluation of the final design with comparisons made to the specification research and customer wants and needs. Suggested changes will be included in the form of design manipulation.
18			Coursework hand in	Final hand in for coursework.
19		Revision of content	Revision of key topics and processes. Past paper revision	2 mark questions with responses. Key word knowledge and questioning from all units of study.

20			Revision of key topics and processes. Past paper revision	4 mark questions with responses. Key word knowledge and questioning from all units of study.
21	<b>Spring T2</b>		Revision of key topics and processes. Past paper revision	6 mark questions with responses. Key word knowledge and questioning from all units of study.
22			Revision of key topics and processes. Past paper revision	10 mark questions with responses. Key word knowledge and questioning from all units of study.
23			Mock paper One	Exam practise
24			Question level analysis review from mock paper.	Challenging questions and topics identified are re taught.
25			Mock paper two	Exam practise
26			Question level analysis review from mock paper	Challenging questions and topics identified are re taught.
27	<b>Summer T1</b>		Revision of key topics and processes. Past paper revision	Manufacturing technique questions with responses. Key word knowledge and questioning from unit 5 study.
28			Revision of key topics and processes. Past paper revision	Manufacturing technique questions with responses. Key word knowledge and questioning from all unit 5 study.
29			Revision of key topics and processes. Past paper revision	Manufacturing technique questions with responses. Key word knowledge and questioning from all unit 5 study.

30			Revision of key topics and processes. Past paper revision	10 mark questions with responses. Key word knowledge and questioning from all units of study.
31			Pupils identify topics that they are finding challenging for a re-teach session.	Flash card revision techniques and keyword testing
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33	<b>Summer T2</b>			
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