RIVERSACADEMY
West London An Aspirations Academy

(DESIGN AND TECHNOLOGY - Curriculum Plan

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7 curriculum overview	Health and safety in the workplace	The design context and specification	The generation of design ideas	Manufacturing specification and Workshop manufacture	Manufacturing of a final product	Evaluation of the final product
Key knowledge outcomes (students should know)	Understand the reasoning behind a risk assessment Be able to identify specific PPE to use in a controlled manor Are aware of the safety rules required to use a workshop safely.	Understand what a design context is and how it shapes a project. Be able to create a design specification which can be used to inform, innovative, functional products. Understand the different types of materials which could be explored and used Gain an understanding of the work of others	Be able to generate design ideas from criteria set. Ideas can be developed, modeled and communicated through discussion, annotated 3-D sketches, cross-sectional, dimensional and exploded diagrams, prototypes, pattern pieces *and computer-aided design*	Understand the need for planning in manufacture through the creation of a manufacturing specification. Be able to identify, select and use a range of tools and equipment safely and with a certain level of accuracy. Apply specific making skills in order to manufacture a fully functional final product	Understand the working processes in a workshop including Datum Different properties of materials and how they are used to produce a final product. Understand the different processes necessary to construct a final product.	Evaluation of the final product to identify the strengths and weaknesses Be able to use evaluations to help inform suggested modifications. Redesign of the final outcome in light of analysis
Key skills (students	Being able to	Be able to identify and	The ability to use	Plan logical steps in	Knowing how to set	The ability to

should be able to)	recognise hazards, judge levels of risk, and understand why controls are needed. Identify and select specific PPE as and when needed. Understanding and applying the rules that keep a workshop safe.	interpret situations, problems or user needs and use this to guide decisions Consider the essential and desirable factors for products Evaluate a material for specific functions Analyse the work of others to inspire and inform their own ideas	constraints and requirements to produce a range of design ideas The understanding of design iteration through development Be able to test and model ideas to help communicate design intent Share design concepts so others can understand.	order to remain safe and produce products. Be able to identify, select and use tools and equipment safely. Be able to use practical techniques to produce a final product.	up, organise, and carry out manufacturing tasks accurately and safely. Knowing how materials behave and how to choose the right one for a specific purpose. Knowing how different manufacturing processes combine to create a complete, functional product.	judge how successful a product is by analysing performance, quality and suitability Be able to identify possible modifications in the light of weaknesses observed through analysis. Apply iteration procedures to improve ideas.
Year 8 curriculum overview	Generation of manufacturing materials to work from.	Apply previous knowledge of tools and equipment in a workshop	Begin using production aids to further develop a final product	Further use of adjustable production aids to increase accuracy and quality	Apply finishing techniques to a final product.	Be able to evaluate the final product to identify ways to improve.
Key knowledge outcomes (students should know)	Understand the process for designing a product through the use of orthographic skills.	Design and plan the manufacturing steps prior to the workshop through the creation of a cutting list.	Demonstrate the use of production aid tools and their ability to speed up and improve accuracy for manufacturing	Use a wide range of adjustable production aids to help with the manufacturing process.	Demonstrate an understanding why products require finishing techniques before being made available for retail.	Through the process of evaluation students are able to offer ways of improvement and

	Creatively use CAD software to produce a series of technical drawings for use in a plan of manufacture	How to select and use safely and with a degree of accuracy tools and equipment in the workshop	purposes. Follow a manufacturing specification in order to anticipate the next steps of a project.	Explain what is meant by the term production aids and the various forms they take such as templates, jigs and formers	Articulate the different types of finishes available for the final product.	future modifications of the final product including design proposals of future iterations.
Key skills (students should be able to)	Create an orthographic image of the individual pieces. Link the orthographic images to manufacturing Use CAD software with confidence to create specific components	Interpret a design - reading of drawings Breaking a product down to its component parts - list each part Sequence manufacturing steps - Plan logical orders Use hand tools correctly Demonstrate controlled techniques	Identify and explain the purpose of production aids. Be able to use production aids to improve accuracy. Work from a manufacturing specification. Adjust workflow when changes occur.	Identify and explain the purpose of adjustable production aids. Calibrate adjustable aids. Describe the different types of production aids: - Templates - Jigs	Explain the purpose of finishing Identify the risks of an unfinished product Select appropriate finishing materials	Evaluate the final design against the original design criteria. Identify strengths and weaknesses Suggest realistic improvements
Year 9 Curriculum overview	Creation of design ideas for a maze game - rules are set and must be adhered to.	Creation of chosen design idea through CAD software	Manufacturing from design plans - Design plans created by the students	The use of components and the preparation work for specific parts	Working to high tolerances to create a final high quality outcome	Evaluation of the final product with suggested modifications

Key knowledge outcomes (students should know)	How to generate ideas which must follow specific rules and regulations. Understand the different drawing techniques and their relationship between one another	How to present their final ideas using CAD software to produce a variety of technical draw Demonstrate an understanding of a final view - exploded diagram Understand the role of a cutting list and how this is used to aid planning and manufacturing.	How to work from their own planning documents to create the outside walls of their maze to a high level of accuracy. How to work independently to select and use tools safely and accurately to produce the final prototype.	Be able to work to high tolerances in the workshop through measuring and marking techniques Understanding the working properties of materials to help create their final product.	Understand the importance of tolerance through over cutting to ensure components are fit for purpose. Know how to assembly and finish of a final product to a high standard	Understand the different evaluation methods in order to fully analyse the final product and its fit for mass production. Understand how further modifications fit within an iterative design approach.
Key skills (students should be able to)	Creatively design a product while adhering to constraints, standards and safety expectations Knowing how different drawing techniques work together to communicate a complete design Additional: Coordinates, wastage calculations, Technical	Confidently using CAD software to communicate designs through accurate professional technical drawings The ability to represent the final products view with component and assembly visuals through such images as final views and exploded diagrams	Use their own working drawings to manufacture components with precision and consistency Select tools and equipment confidently and with an understanding of the function and use. Additional: Logical sequences, accurate use of tools,	Produce components with precision through the use of accurate measurements and tight tolerances. Understand the working properties of materials and they can be used in combination. Additional: Wastage and addition processes, Preparing	Be able to work with precision by intentionally over-cutting and then refining components to achieve an accurate fit. Knowing how to put components together securely and apply finishing techniques that improve durability and appearance.	Being able to evaluate a product using structured, varied methods — and judge whether it is suitable for scaling up to mass manufacture Knowing how to improve a design through repeated cycles of testing, feedback, and refinement.

	drawings	Additional: CAD software, presentational skills		and using materials.	Additional: Squaring, clamping techniques, quality control	Additional: Scales of production, iteration cycle
Year 10 curriculum overview	Task light project: Part 1 Research and investigation into the needs and wants of consumers Product evaluations Designing creative ideas and planning for manufacture.	Task light project: Part 2 Manufacturing of final product including electronics and final finish Evaluation and analysis of the final product	Marble run competition: Group activity to create a run which meets specific requirements.	Desk Tidy Modeling project: Students create a range of ideas with one being chosen to develop three times through modelling techniques and materials this then leads to CAD drawings	Desk Tidy Modelling project. Students use there development s and technical drawings to create a final product in the workshop.	NEA introduction and completion of Section A and B
Key knowledge outcomes (students should know)	How to gather information from various sources. Content: 3.2.1: Selection of materials or components 3.2.2: Forces and stresses 3.2.3: Ecological and social footprint	How to select tools and equipment with an understanding of them including accuracy and safety. Content: 3.1.4 Systems approach to designing 3.2.4: Sources and origins 3.2.5 Using and working with	How to work collaboratively with a team and other designers. How to plan and work to a deadline. Content: 3.1.5 3.2.6: Stock forms, types and sizes 3.2.7 Scales of	Content: 3.2.8: Specialist tools and equipment 3.2.9 Surface treatments and finishes 3.1.1 New and emerging technologies	Content: 3.1.2 Energy generation and storage 3.1.3: Developments in new materials 3.1.6: Materials and working properties	Content: 3.3.1: investigation, primary and secondary data 3.3.2 Environmental, social and economic challenge 3.3.3 The work of others.

		materials	production			
Key skills (students should be able to)	Investigation: research techniques into consumer needs and existing solutions Reasoning: selective with the data and information collected Justification: design specifications require justification along with a clear understanding between the essential and the desirable. - inclusion of ACCESS FM Creativity: designing with flair and innovation through strategies which avoid design fixation.	Problem solving: Measuring and marking out Cutting and shaping Joining and finishing Electronic systems. Realisation of idea: Being able to successfully see the construction of a product from start to finish. Evaluation: Reflecting on the work created and identifying areas for improvement.	Designer collaboration: Students work in groups, sharing ideas and critiquing suggestions. Creativity: Students will create a unique model Problem solving: Student will be checking the success of their product at various stages to ensure that it meets the specified requirements	Creativity: Design ideas are produced which avoid design fixation and show a good level of innovation Modelling: trialling prototypes to see how they function Iteratively thinking: Evaluation at each stage of development Reasoning with decisions to inform change. Testing out ideas.	Communication: Through a range of drawing techniques students will be presenting ideas and drawing with technical information Handling data: Orthographic data and exploded diagrams require precision marking and an understanding of logical placements of multiple components. Drawing techniques: A focus on 3.3.5 Communication of design ideas to represent ideas.	Investigation: Exploring design possibilities based on a design contextual challenge set by AQA Reasoning: Backing up the choices through each of the threads in early exploratory work Justification: Design specification requirements require justification to reflect the investigation and contextual challenge.
Year 11 curriculum overview	NEA continuation with Sections B, C and D. Students complete the	NEA continuation with Sections D and E Students consolidate	NEA continuation with Sections E and F Students complete	NEA final touches - missing slides or final corrections.	NEA submission to AQA Focussed skills toward Final exam.	

	Design brief and design specification sections and then the designing and development section of the NEA coursework with focus on a range of ideas leading to one developed one.	their development work to create a final idea which they begin to manufacture in the workshop.	their final products and put it through a series of test and evaluation processes.	Students given final chances to amend any issues with their final submissions	Focus on 3.3.5and Long answer format questioning. From 3.2 Specialist technical principles	
Key knowledge outcomes (students should know)	How the design processes and iterations play a part in creating a final product. Content: 3.3.4: Design strategies 3.3.6: prototype development 3.3.7 Selection of materials and components	How to evaluate progress and use the data to inform decisions leading to a full understanding of how the final product is intended to be manufactured. Content: 3.3.8 Tolerance 3.3.9: Material management 3.3.10: Specialist tools and equipment	Full working understanding of the final product and the materials and techniques used to produce it. Content: 3.3.11: Specialist techniques and processes. 3.1.6: revisit of materials and working properties	Content: 3.1: Core technical principles should now be covered and understood by the students 3.2 Specialist technical principles should now be covered and understood by the students 3.3 Designing and making principles should now be covered and understood by the students	Students should be aware of how to break down the long answers into chunks and then respond in a full coherent answer.	
Key skills (students should be able to)	Creativity: designing with flair and innovation through strategies which avoid	Practical: Workshop skills used to select and use a variety of tools and equipment.	Selection of materials or components: Functionality,	Greater depth of knowledge from selected units: Understanding the	Communication: Cross Curricular based: Focus on maths	

	design fixation. Communication: Applying further details and information to each design idea and later, developments. Realisation: Moving ideas from 2D into 3D	Problem solving: Measuring and marking out Cutting and shaping Joining and finishing Electronic systems. Evaluation	Aesthetics, environmental factors, availability, cost, social factors and ethical factors. Surface treatments and finishes: Preparation and application of treatments and finishes to enhance functions and aesthetics - Painting varnishing and tanalising	need for iterative design and how designers can avoid design fixation. Working through the skills needed to complete technical drawings from orthographic understanding to 2 point perspectives drawing. Greeted look into Specialist techniques and processes with a focus on knowing when specific actions of tools and equipment are elected.	skills: Area Volume Ratio Percentages Graph creation: Bar charts Pie charts Focus on science skills Understanding material extraction and conversion Impact on the environment Sustainability issues Clean energy Finite resources Energy consumption.	