Y9 Design & Technology

By the beginning of Y9 students will have been studying Design & Technology for 10 weeks in Y7 and the whole of Y8. The curriculum in Y9 is designed to increase the breadth and level of challenge with regards to Key Knowledge and practical skills and techniques through a range of investigative, design, make and evaluation projects. Main material categories are utilised in these projects; timber, polymer, paper and board (standard components are also introduced).

WHAT?	WHY?	HOW?	HOMEWORK:	SUPPORT:
DRAWING SKILLS AND PRODUCT ANALYSIS	APPROXIMATELY 50% OF THIS PROJECT WILL ACT AS A VEHICLE FOR THE FOLLOWING KEY KNOWLEDGE:	APPROXIMATELY 50% OF THIS PROJECT WILL BE BASED UPON SKILLS AND TECHNIQUES INCLUDING:	A mix of Google Classroom tasks and worksheets. In the situation where this is the first project for students in Y9 homework will be based upon Key Knowledge from their last project in Y8. In the situation where this project is the second or third unit of work in Y9 homework will be based upon the previous project.	A useful website for students studying Design & Technology is called 'Technology Student'. Students should type into their browser the website name and then the particular area of Design & Technology they require e.g. technology student – two-point perspective.
	Developments in technical textiles. To apply technical knowledge and understanding of the characteristics, applications, advantages and disadvantages of agro, constuction, geo, domestic, environmentally friendly, protective and sports textiles.	How to freehand sketch.		
		How to annotate sketches/design ideas.		Another useful website is bbc bitesize: https://www.bbc.co.uk/bitesize/examspecs/zb6h92p
	The categorisation of the types, properties and structure of papers and boards. To apply knowledge and understanding of working properties, characteristics, applications, advantages and disadvantages of copier, cartridge and tracing paper, of folding boxboard, corrugated and solid white board.	How to use cut and paste techniques, digital photography and media.		
	Properties of paper and boards including fexibility, printability and biodegradability.	How to create isometric projection, oblique projection, perspective, orthographic, exploded view, assembly, system and schematic drawings/diagrams.		For example see links:
	The strategies, techniques and approaches employed when investigating and analysing the work of past and present professionals and companies in order to inform design based on key criteria such as form, function, client, user and performance requirements, materials and components, scale of production and costs, sustainability, aesthetics, marketability and innovation.			
	The work of past and present designers and companies including Alessi, Apple, Heatherwick Studio, Joe Casely-Hayford, Pixar, Raymond Lowry, Tesla and Zaha Hadid.	How to record and justify design ideas using written techniques.		https://www.bbc.co.uk/bitesize/guides/zjq8jty/revision/1 ht
	The development and use of a range of communication techniques and media to present design ideas, including freehand, isometric, oblique, perspective and assembly drawings. The development of annotated sketches and drawings. The use of cut and paste techniques, system and schematic diagrams, orthographics and exploded view drawings.	How to investigate and analyse the work of past and present designers/ companies.		https://www.bbc.co.uk/bitesize/guides/zfr3rwx/revision/1 https://www.bbc.co.uk/bitesize/guides/zvkck2p/revision/4 https://www.bbc.co.uk/bitesize/guides/zmshsrd/revision/3 https://www.bbc.co.uk/bitesize/guides/zmshsrd/revision/4 https://www.bbc.co.uk/bitesize/guides/zmshsrd/revision/5
		How to investigate and analyse a product.		

WHAT?	WHY?	HOW?	HOMEWORK:	SUPPORT:
AUTOMATA PROJECT	**APPROXIMATELY 50% OF THIS PROJECT WILL ACT AS A VEHICLE FOR THE FOLLOWING KEY KNOWLEDGE:**	**APPROXIMATELY 50% OF THIS PROJECT WILL BE BASED UPON SKILLS AND TECHNIQUES INCLUDING:**		
	The impact of new and emerging technologies in industry with regards to unemployment, workforce + skills, demographic movement, science + technology parks.	Choice of tools and equipment	A mix of Google Classroom tasks and worksheets. In the situation where this is the first project for students in Y9 homework will be based upon Key Knowledge from their last project in Y8 . In the situation where this project is the second or third unit of work in Y9 homework will be based upon the previous project.	A useful website for students studying Design & Technology is called 'Technology Student'. Students should type into their browser the website name and then the particular area of Design & Technology they require e.g. technology student - environment issues.
	The impact of new and emerging technologies in enterprise with regards to privatly-owned business, cloud funding, government funding for new business start-ups and not-for-profit organisations.			
	The impact of new and emerging technologies for sustainability with regards to transportation costs, pollution, demand on natural resources and waste generated.	Choice of materials and standard components		Another useful website is bbc bitesize: https://www.bbc.co.uk/bitesize/examspecs/zb6h92p
	The impact of new and emerging technologies for people with regards to workforce, consumers, children, people with disabilities, wage levels, highly-skilled workforce and apprenticeships.	Cutting timber		For example see links:
	The impact of new and emerging technologies for culture with regards to population movement within the EU, social segregation/clustering within ethnic minorities.	Shaping timber		https://www.bbc.co.uk/bitesize/guides/zh2w7p3/revision/1 https://www.bbc.co.uk/bitesize/guides/zdkr97h/revision/2 https://www.bbc.co.uk/bitesize/guides/zk9g4qt/revision/1
	The impact of new and emerging technologies for society with regards to changes in working hours and shift patterns, Internet of Things (IoT), remote working and the use of video conference meetings.	Joining timber		https://www.bbc.co.uk/bitesize/guides/zrrvgdm/revision/1 https://www.bbc.co.uk/bitesize/guides/zffhsrd/revision/1
	The impact of new and emerging technologies on the environment with regards to pollution, waste disposal, materials separation and the transportation and packaging of goods.	Finishing timber		
	Production techniques and systems which include standardised design and components, just-in-time (JIT), lean manufacturing, batch, continuous, one-off and mass.	CAD/CAM		
	The categorisation of the types, properties and structure of natural and manufactured timbers including oak, mahogany, beech, balsa, jelutong, birch, ash, pine, cedar, larch, plywood, medium density fibreboard (MDF), chipboard.	IT use (Key Knowledge and homework)		
	Working properties – the way in which a material behaves or responds to external forces for example hardness, toughness, durability, elasticity, tensile strength and compressive strength.	Research and investigation		
	Performance characteristics of materials, components and manufacturing processes including their properties, advantages/disadvantages and the justification of their choice.	Analysis		
	The functions of mechanical devices used to produce different sorts of movements, including the changing of magnitude and the direction of forces. The performance, principles, applications and the influence on the design of products of the following: Linear, reciprocation, rotary, oscillation	Mechanisms and movements		
	The analysis of a product takes place to the following specification criteria: form, function, client and user requirements, performance requirements, materials and components, scale of production and cost, sustainability, aesthetics, marketability and innovation.			
	The development and use of a range of communication techniques and media to present design ideas, including 3D models, isometric, oblique, orthographic, exploded view drawings, CAD and written techniques.			
	The impact of forces and stresses on natural and manufactured timber for example compression, tension and shear and how they can be reinforced and stiffened.			
	Production techniques which include batch, continuous, one-off and mass.			
	Techniques for quantity production for example templates, computer-aided manufacturing (CAM), quality control and efficient cutting to minimise waste.			
	Specialist techniques, tools, equipment, processes and finishes for example hand tools, machinery, digital design and manufacture, drilling, cutting, nailing, wastage, varnishing and wax.			

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ANGLEPOISE LAMP PROJECT	**APPROXIMATELY 50% OF THIS PROJECT WILL ACT AS A VEHICLE FOR THE FOLLOWING KEY KNOWLEDGE:**	**APPROXIMATELY 50% OF THIS PROJECT WILL BE BASED UPON SKILLS AND TECHNIQUES INCLUDING:**	A mix of Google Classroom tasks and worksheets. In the situation where this is the first project for students in Y9 homework will be based upon Key Knowledge from their last project in Y8. In the situation where this project is the second or third unit of work in Y9 homework will be based upon the previous project.	A useful website for students studying Design & Technology is called 'Technology Student'. Students should type into their browser the website name and then the particular area of Design & Technology they require e.g. technology student - environment issues.
	The work of past and present designers and companies including Alessi, Apple, Heatherwick Studio, Joe Casely-Hayford, Pixar, Raymond Lowry, Tesla and Zaha Hadid.	Research		
	The development and use of a range of communication techniques and media to present design ideas, including freehand, isometric, oblique, perspective and assembly drawings. The development of annotated sketches and drawings. The use of cut and paste techniques, system and schematic diagrams, orthographics and exploded view drawings.	Design		Another useful website is bbc bitesize: https://www.bbc.co.uk/bitesize/examspecs/zb6h92p
	The impact of new and emerging technologies for sustainability with regards to transportation costs, pollution, demand on natural resources and waste generated.			For example see links:
	The impact of new and emerging technologies for people with regards to workforce, consumers, children, people with disabilities, wage levels, highly-skilled workforce and apprenticeships.	Cutting timber		https://www.bbc.co.uk/bitesize/guides/zh2w7p3/revision/1 https://www.bbc.co.uk/bitesize/guides/zdkr97h/revision/2 https://www.bbc.co.uk/bitesize/guides/zk9g4qt/revision/1 https://www.bbc.co.uk/bitesize/guides/zrrvgdm/revision/1 https://www.bbc.co.uk/bitesize/guides/zffhsrd/revision/1
	The impact of new and emerging technologies for culture with regards to population movement within the EU, social segregation/clustering within ethnic minorities.	Shaping timber		
	The impact of new and emerging technologies for society with regards to changes in working hours and shift patterns, Internet of Things (IoT), remote working and the use of video conference meetings.	Joining timber		
	The impact of new and emerging technologies on the environment with regards to pollution, waste disposal, materials separation and the transportation and packaging of goods.	Finishing timber		
	Production techniques and systems which include standardised design and components, just-in-time (JIT), lean manufacturing, batch, continuous, one-off and mass.	CAD/CAM		
	The categorisation of the types, properties and structure of natural and manufactured timbers including oak, mahogany, beech, balsa, jelutong, birch, ash, pine, cedar, larch, plywood, medium density fibreboard (MDF), chipboard.	IT use (Key Knowledge and homework)		
	Working properties – the way in which a material behaves or responds to external forces for example hardness, toughness, durability, elasticity, tensile strength and compressive strength.	Research and investigation		
	Performance characteristics of materials, components and manufacturing processes including their properties, advantages/disadvantages and the justification of their choice.	Analysis		
	How electronic systems and components provide functionality to products including the role of sensors, light dependent resistors, thermistors, switches, transistors, and resistors. Outputs including buzzers and light emitting diodes (LED's).	Electronic components		
	The analysis of a product takes place to the following specification criteria: form, function, client and user requirements, performance requirements, materials and components, scale of production and cost, sustainability, aesthetics, marketability and innovation.			
	The development and use of a range of communication techniques and media to present design ideas, including 3D models, isometric, oblique, orthographic, exploded view drawings, CAD and written techniques.			
	The impact of forces and stresses on natural and manufactured timber for example compression, tension and shear and how they can be reinforced and stiffened.			
	Production techniques which include batch, continuous, one-off and mass.			
	Techniques for quantity production for example templates, computer-aided manufacturing (CAM), quality control and efficient cutting to minimise waste.			
	Specialist techniques, tools, equipment, processes and finishes for example hand tools, machinery, digital design and manufacture, drilling, cutting, nailing, wastage, varnishing and wax.			