Alcester Academy Curriculum Planning: Key Stage 4

	Department: *Design and Technology*						
Term	Topic/Subject	Assessment Objectives and Knowledge (include differentiation)	Knowledge acquisition	Skill building **Intent**	Wider reading opportunities to include numeracy and SMSC	Final Assessment	SEND PP
Autumn 1	Building bridges (The Morandi Bridge project)	The work of others. Selection of materials or components. Forces and stresses. Manipulating materials to resist/work with forces. Key forces defined and explained. Identification of products being designed to withstand/resist certain forces (bridges, cars, textiles). To understand forces and stresses. Know about careers in engineering.	Re-caps using starters and plenaries. Quizzing Building on prior learning through questioning and link previous learning to more recent topics.	Practical experimentation with material. Testing materials to understand how they can resist/withstand forces applied to them. Problem solving in pairs.	Key words identified. Information about careers. This is a paired project so team work is crucial.	Model bridge to be built and tested with weights.	TA support. Key words introduced at the beginning of each topic on ppt slides. Use of computers for mock NEA extended writing.
Autumn 2	Investigate, analyse and evaluate the work of past and present	The work of others. Design strategies Communication of design ideas.	Re-caps using starters and plenaries. Quizzing	Able to answer a range of exam style questions	Key words identified. Appreciating the work of others.	End of unit test. Weekly quizzing.	

	designers/ companies. Generating imaginative and creative designs.	To understand different properties of a variety of materials. Properties and structure of Natural and manufactured timbers Investigate environmental/social/economic challenges within the designing and making process. Manufacture the prototype using card. Independent research into a designer or company. A range of sources to strengthen research skills and deepen understanding of chosen focus. Presentation of research and findings. Note taking skills employed to broaden knowledge of a range of designers and companies. Product analysis of a range of key products for that designer. Students identify a user/client and discuss briefly their needs and wants. Explore and develop ideas for a product using sketching and modelling techniques.	Building on prior learning through questioning and link previous learning to more recent topics. End of unit tests and practice exam questions.	Select suitable materials for projects. Questioning used to assess knowledge gained. Opportunities to visit math's links – comparative chart of performance criteria. As for existing products to help evaluate them. Constant discussion about what needs to be researched as a direct response to the ideas students generate. Select suitable materials for projects.	Communicative skills. How to present ideas to other people in a clear and coherent way.		

		Product to reflect the designer/company previously researched. Freehand sketching, 2D and 3D drawings used to communicate, system and schematic drawings, annotated drawings that fully explain detailed conceptual stages.					
Spring 1	Light project.	Understand how to use primary and secondary research. Using primary and secondary data to understand client and/or user needs. Market research, interviews, human factors. How to write a design specification.	Re-caps using starters and plenaries. Quizzing Building on prior learning through questioning and link previous learning to more recent topics.	Able to answer a range of exam style questions.	Liaising with people from a specific target market group.	Completed portfolio.	
Spring 2	Light project	To understand different methods of producing design ideas e.g. the use of CAD. Understand how to work to a specification. Use of the laser cutter/3d printer within the design work. Understanding how and why finishes are used to enhance products.	Re-caps using starters and plenaries. Quizzing Building on prior learning through questioning and link previous learning to more recent topics.	Able to answer a range of exam style questions.	Identify key words. Opportunities to visit maths links – measurements, scale drawings. Appreciating the work of others. Understanding the needs and wants of a target market group.	Portfolio and prototype.	
Summer 1	Bird feeder research/designs.	Investigation, primary and secondary data.	Re-caps using starters and plenaries.	Carry out independent research to	Percentile ranges used in anthropometrics	Portfolio and prototype.	

		Communication of design ideas. Using primary and secondary data to understand client and/or user needs. Market research, interviews, human factors. How to write a design specification. Isometric and perspective designs Exploded diagrams Working drawings Computer-based tools Audio and visual recordings Modelling.	Quizzing Building on prior learning through questioning and link previous learning to more recent topics.	inform own design ideas.	and/or ergonomics. Opportunities to visit maths links – presentation of client survey responses. Opportunities to visit maths links – frequency tables and percentile ranges. Opportunities to visit maths links – measurements, scale drawings. Understanding the needs and wants of a target market group. Understanding how to communicate ideas with people.		
Summer 2	Bird feeder Practical.	Specialist tools and equipment. Specialist techniques and processes. Tolerances. Material management. Selection of materials and components.		Selection of the correct hand tools and machinery, safe use of tools Selection and use of specialist techniques (used to shape, fabricate, construct).	Opportunities to visit maths links – accurate use of tolerances. Understanding tolerances and how these are used in industry to ensure the customer receives products that are accurate.		

		Students will demonstrate different tools and equipment explaining key health and safety and quality control techniques. Risk assessments Working accurately Cutting, shaping and forming materials to tolerance. Planning the cutting of materials to minimize waste (linking to tolerance) Materials are selected based on functionality, cost and availability.					

Last updated: *08.07.21 by WI*