




Year:		10	Subject:	Design & Technology	Autumn 1 & 2 : Biomimicry Lamp design	Spring 1: The work of others	
Intent	Subject Concepts (Substantive knowledge) 		<ul style="list-style-type: none"> Core technical principles 	Systems approach to designing: output New and emerging technologies Materials & their working properties	Prior Knowledge: <ul style="list-style-type: none"> Automation has largely replaced manual labour in the manufacturing industry Understanding of the role of bulbs, buzzers and switches Being able to identify materials that products are made from and justify the reason for their use Takeaway Learning: <ul style="list-style-type: none"> Be aware of how computers and automation have impacted upon the design and organisation of the workplace through the use of robotics Exploring the contemporary and potential future use of CAD/CAM and rapid prototyping Understand that new technologies need to be developed and produced in a sustainable way To learn component names Exploring how use of electrical components can improve functionality 	New and emerging technologies Developments in new materials	Prior knowledge: <ul style="list-style-type: none"> That fashion and trends change That properties of materials have been adapted through the invention of new or improved processes Takeaway Learning: <ul style="list-style-type: none"> Appreciation of how technology push/market pull affects choice in relation to interior design An understanding of how peoples culture, faith and beliefs can be communicated through design Understanding of how products/spaces are designed to avoid having a negative impact on others Exploring how modern and smart materials could be used to enhance an interior
			<ul style="list-style-type: none"> Specific technical processes 	Selection of materials and components Using and working with materials Specialist techniques and processes Ecological & social footprint	Prior Knowledge: <ul style="list-style-type: none"> Basic properties of polymers Basic properties of timbers How to use the pillar drill, belt sander and a range of hand tools accurately and safely How production aids can simplify manufacturing processes Takeaway Learning: <ul style="list-style-type: none"> How a 3D printer can be used to shape, fabricate and assemble high quality prototypes (addition) Exploring how rapid prototyping is used across the world for different purposes Commercial processes: Explore how tools, equipment and processes are used to shape, fabricate, construct and assemble high quality prototypes in industry Understand how and why treatments and finishes are applied. 	Ecological & social footprint	Prior knowledge: <ul style="list-style-type: none"> That some products can be recycled That some spaces are designed to be sustainable Takeaway Learning: <ul style="list-style-type: none"> Explore how commercial buildings are designed with sustainability in mind Exploring how people have successfully up-cycled furniture and the impact on the environment
			<ul style="list-style-type: none"> Designing and making principles 	Investigation, primary and secondary data Tolerances Specialist tools and equipment Design Strategies Specialist techniques and processes	Prior Knowledge: <ul style="list-style-type: none"> The benefits of using computers to visualise design intentions and ideas The role of stakeholders in designing and developing products Takeaway Learning: <ul style="list-style-type: none"> Generate imaginative and creative design ideas using a range of different design strategies To use Tinkercad/Shapr3D with accuracy in order to complete quality outcomes Use a range of tools, equipment and processes to shape, construct and assemble high quality prototypes 	Investigation, primary and secondary data The work of others Design strategies Communication of design ideas	Prior Knowledge: <ul style="list-style-type: none"> Understanding of how research can be collected Some awareness of past and present designers and how successful they have been Freehand sketching skills Takeaway Learning: <ul style="list-style-type: none"> Gather information about your chosen location to inform your planning/designing using primary research methods Gather anthropometric data from a client of your choice Investigate, analyse and evaluate the work of past and present designers to inform your own designing Communicate design intentions through working drawings including one-point and two-point perspective Use modelling to communicate design intentions
Disciplinary Knowledge			<ul style="list-style-type: none"> How to solder accurately and safely How to turn a piece of timber using a wood lathe How to set up and use the 3D printer How to develop a design idea using CAD (Tinkercad/Shaper3D) How to use handtools and workshop machinery safely for cutting and abrasion How to design creatively and avoid design fixation 	<ul style="list-style-type: none"> How to evaluate the work of past and present designers How to explain what anthropometrics and ergonomics are and give suitable examples How to draw to scale How to draw in one point perspective How to generate design ideas for a product in the style of a past of present designer. 			
Implementation	Common Misconceptions		<ul style="list-style-type: none"> Designers use cm as standard unit of measurement Plastic is bad for the environment 				
	Enabling or Adapting the Curriculum	SEND Students	<ul style="list-style-type: none"> One to one demonstrations Link new learning to prior learning for context Sequential diagrams of processes to support verbal instructions Vocabulary lists Paired soldering for peer support Checking of circuit boards ahead of soldering 	<ul style="list-style-type: none"> One to one demonstrations Handouts to support verbal instructions Specific time frames Vocabulary lists Access to exemplar work 			
		Disadvantaged Students	<ul style="list-style-type: none"> STEM F1 workshop 	<ul style="list-style-type: none"> Access to examples of designer work Afterschool support 			

		More Able Students	<ul style="list-style-type: none"> Modify assignment to include additional criteria Allocate 'expert' role 	<ul style="list-style-type: none"> Students to suggest suitable modifications as part of the evaluation 		
	Literacy/Numeracy Skills 	LITERACY	Vocab: <ul style="list-style-type: none"> Key vocab on starter slide each lesson Pixl unlock starter task 	<ul style="list-style-type: none"> Dimensions, CAD, CAM, 3D printer, Manufacture, design, develop, proportion, prototype, rapid prototyping, quality control, filament, extrude, additive manufacturing, planning, lathe, wastage, subtraction, solder, soldering iron, datum point 	<ul style="list-style-type: none"> Design, designer, influence, anthropometric data, ergonomics, interior design, one point perspective, development, influential, evaluate, render 	
			Reading:	<ul style="list-style-type: none"> Week 5 – DT PCAS Reading task 	<ul style="list-style-type: none"> Designer research 	
			Writing:	<ul style="list-style-type: none"> Creating step by step instructions of how the 3D printer works including quality control and H&S Critically annotate design ideas 	<ul style="list-style-type: none"> Written evaluation of finished product (sentence starters provided where needed) 	
			Oracy:	<ul style="list-style-type: none"> Offering verbal feedback to peers Students to provide verbal instructions/recaps on use of handtools 	<ul style="list-style-type: none"> Students to present their design ideas to a small group. 	
		NUMERACY	<ul style="list-style-type: none"> Marking up of material Calculating material use/creating cuttings list using basic geometry Use of measuring gauges 	<ul style="list-style-type: none"> Drawing to scale 		
	Digital Strategy 		<ul style="list-style-type: none"> Use of CAD packages (Tinkercad/Shapr3d) Importing and exporting different file types 	<ul style="list-style-type: none"> Secondary research of past and present designers 		
	Home Learning		<ul style="list-style-type: none"> SENECA assignments (set weekly) Biomimicry research Product Analysis using ACCESSFM 	<ul style="list-style-type: none"> SENECA assignments (set weekly) Designer study 		
Impact	Composite Assessment		Content	Date	Content	Date
			1) Quality of design ideas and annotation	End of Autumn 1	Designer study	End of Spring 1
			2) Written composite assessment : ACCESSFM, Wastage (timbers) rapid prototyping, soldering, timbers, electronic components	End of Autumn 2		