Calendar	Big Question/Theme	Small Questions	Assessment Opportunities & Criteria. Teacher Feedback point (TFP)	Homework
Autumn Term	• 1.1 How can exploring the context a design solution is intended for inform decisions and outcomes? • 1.2 Why is usability an important consideration when designing prototypes?	• Where are products used? • What is a primary user • What is a stakeholder? • How do social, cultural, moral and economic factors influence the design process? • What is meant by the term 'lifestyle'? • How are products designed to be inclusive? • What is anthropometrics and ergonomics? • What is aesthetics?		
	• 2.1 What are the opportunities and constraints that influence design and making requirements? • 2.2 How do developments in Design and Technology influence design decisions and practice?	When exploring and critiquing existing products, can you identify the following: Materials, components and processes that have been used. • The influence of fashion trends, taste and style • The influence of marketing and branding • The impact on society • The impact on usability • The impact on the environment; lifecycle assessment • Thea work of past and present professional and companies in the area of Design technology. • How do new and emerging technologies influence and inform design in terms of ethics, the environment and product enhancement?		
	• 3.1 What are the impacts of new and emerging technologies when developing design solutions? • 3.2 How do designers choose appropriate sources of energy to make products and power systems? • 3.3 What wider implications can have an influence on the processes of designing and	• What is a circular economy? • How is industry and enterprise impacted on by new and emerging technologies? • How does new and emerging technology impact on people, lifestyle, culture and society? • How do new and emerging technologies affect the environment? • What is sustainability and how can new and emerging technology help? • How is electricity generated, stored and transferred? • What is the difference between renewable and non-renewable? • How do you define a fossil fuel, nuclear fuel and a bio fuel? • How do you define wind power, hydro-electricity, tidal and solar power? • What is an environmental initiative? • What is fairtrade? • How do you describe social and ethical awareness?		

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Spring Term	• 4.1 (maths & science) How can design solutions be communicated to demonstrate their suitability to a third party? • 4.2 How do designers source information and thinking when problem solving?	• How do you draw in 2d and 3d? • What are the benefits are drawing in 2d and 3d? • How do you annotate 2d and 3d sketching? • What is an exploded drawing, where are they used and how do you draw one? • What is mathematical modelling? • What is flowchart, how do they work and how do you develop one? • What is user centred design • What is meant by systems thinking when solving problems? • Why is it important to collaborate to gain specialist knowledge from across subject areas when delivering solutions in design and manufacturing industries.		
	• 5.1 What are the main categories of materials available to designers when developing design solutions?	Do you have an understanding of papers and boards in terms of: • What papers are commonly used e.g. layout and cartridge, different weights and coatings? • What cards are commonly used e.g. carton board, bleached card and corrugated card? Do you have an understanding of boards/sheets, • What is foam board, Styrofoam and polypropylene sheet? • What is meant by laminated layers e.g. reflective surfaces? Do you have an understanding of natural and manufactured timbers, including: • How do you define a hardwood and can you suggest possible examples? • How do you define a softwood and can you suggest possible examples? • Do you have an understanding of manufactured boards and can you suggest possible examples and uses? Do you have an understanding of ferrous and non-ferrous metals, including: • How do you define a ferrous metal and can you suggest possible examples? • How do you define a non-ferrous metal and can you suggest possible examples? • How do you define a metal alloy and can you suggest possible examples? Do you have an understanding of thermo and thermosetting polymers, including: • How do you define a thermo polymer and can you suggest examples?, e.g. PET, HDPE, PVC, LDPE, PS, PP, ABS, acrylic and TPE • How do you define a thermosetting polymer and can you suggest examples?, e.g. silicone; epoxy resin and polyester resin. Do you have an understanding of textile fibres and fabrics, including: • How do you define natural fibres and can you suggest examples?, e.g. cotton, wool and silk • How do you define synthetic fibres and can you suggest examples?, e.g. nylon, polyester and acrylic • How do you define a mixed/blended fibre and can you suggest examples?, e.g. cotton/polyester • How do you define a woven, non-woven and knitted fabric?		

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Spring Term	• 5.2 What factors are important to consider when selecting appropriate materials and/or system components when designing? • 5.4 Why is it important to know the different available forms of materials and components?	• What is the difference between material physical and working properties? • What is material density? • What is material strength? • What is material hardness? • What is material durability? • What is strength to weight ratio? • What is material stiffness? • What is elasticity? • What is meant by impact resistant? • What is plasticity? • How is a material resistant to corrosion when exposed to chemical and weather? • What is flammability? • What is absorbency • What is thermal and electrical conductivity? • What are the units of measurements associated with different materials and components? How do you calculate costs and quantities including: • Weights and sizes • Lengths, sheets, pellets, reels, rolls and rods • Do you have an awareness of: • **Papers and boards e.g** clips, fasteners and bindings? • **Timbers hinges e.g** brackets and screws? • **Metals e.g.** bolts, rivets and hinges? • **Polymers e.g.** caps, fasteners and bolts • **Fibres and fabrics e.g.** zips, buttons and poppers? • **System components e.g.** resistors, capacitors, transistors, drivers, microcontrollers and diodes? • **Mechanical components e.g.** gears, cams pulleys, belts, levers and linkages?		

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Summer Term	• 6.3 How do we introduce controlled movement to products and systems? • 6.4 How do electronic systems provide functionality to products and processes?	• How do you describe rotary motion? • How do you describe linear motion? • How do you describe reciprocating motion? • How do you describe oscillating motion? • What is load? • What is effort • What is the fulcrum • What classes of levers are there? • How do you achieve mechanical advantage in the three classes of levers? • How do you calculate mechanical advantage, velocity ratio and efficiency? • How are different mechanical devices achieve change in magnitude, direction, motion, and force? • Do you have an awareness of cams, gears, pulleys, belts, levers and linkages? • How do LDRs and infra red sensors respond to inputs and outputs? • How do tilt switches, push to make switches and time delay switches work? • How does an LED produce light? • How do speakers and buzzers work? • How can you use motors to produce motion? • How are programmable components used to embed functionality into products?		
	• 7.6 How do new and emerging technologies have an impact on production techniques and systems?	• What is meant by the term emerging technologies? • Why is it important to consider economies of scale? • How are disruptive industries such as 3d printing and robotics changing manufacturing?		