	Year 5		Year 6		Year 7		Year 8	
Research and Design	Use research **(existing products/provided examples - discuss/opinion)** to inform designing L.O - Examine existing products and discuss their purpose	Y	Use research **(independent, internet based)** to inform designing. To research a design challenge using the internet	Y	Use research **and exploration to identify user needs** to inform designing LO: Use research to collect images that will help with designing	Y	Use research and exploration to identify **and understand (explain/justify)** user needs, informing designing LO: Use research to collect images that will help with designing and explain why	Y
	Develop **simple** design criteria to inform the design - using F.U.M.E.S [function,user,materials, environment,safety] [consider particular individuals or groups] L.O - Understand F.U.M.E.S to help you design	Y	Analyse a design brief and **explain** design criteria to inform the design - using F.U.M.E.S [function,user,materials, environment,safety] [consider particular individuals or groups]. To explain the design brief using F.U.M.E.S	Y	Develop specifications to inform the design of functional, appealing products that respond to the needs of users - using ACCESS FM [aesthetics, cost, customer, environment, size, safety, function, materials] LO: Write a specification in response to the design brief	Y	Develop and **justify** specifications to inform the design of innovative, functional, appealing products that respond to needs in **a variety of situations** - using ACCESS FM [aesthetics, cost, customer, environment, size, safety, function, materials] LO: Write and justify a specification in response to the design brief	Y
	Design functional, appealing products that are fit for purpose L.O - Design products that are fit for their user	Y	Design and communicate **(annotate)** functional, **appealing** products that are fit for purpose. To develop anotated design ideas relating to the design brief and F.U.M.E.S	Y	Use a **variety of approaches** to generate creative annotated ideas	Y	Use a variety of approaches to generate **a range of detailed** creative annotated ideas, avoiding stereotypical responses	Y
	Generate and communicate ideas through discussion, sketches and cross-sectional drawing L.O - Understand what an Isometric drawing is. (cross sections of wood)	Y	Generate, develop, model and communicate their ideas through discussion, **annotated** sketches, cross-sectional and exploded diagrams To develop a chosen idea. To construct a scale plan.	Y	Develop and communicate design ideas using annotated sketches, **plans and computer-based tools** LO: Develop a range of creative designs with annotation	Y	Develop and communicate design ideas using annotated sketches, **detailed plans**, **3-D and mathematical modelling**, [oral and digital] presentations and computer-based tools LO: Develop a range of creative designs with detailed annotation LO: Recreate a product design using 3D modelling	Y
	Use of templates and **awareness of computer-aided design** L.O - Understand what a template is, and why they are used	Y	Develop **prototypes** and **use of computer-aided design** To measure, mark and cut to form a prototype. To use 2D Design to design a profile	Y				
					Solve design problems and understand how to reformulate problems given to them [stand-alone?] LO: Compose a design brief and specification using ACCESS FM	Y	**Identify and solve their own design problems** and understand how to reformulate problems given to them [stand-alone?] LO: Compose a design brief and thorough specification using ACCESS FM LO: Identify and design solutions to a problem	Y
Make	Use a range hand tools **provided** L.O - Recognise and use correctly the yr 5 tools	Y	Use hand tools **provided and explain** why they are appropriate to the task.	Y	Select from **[a selection]** and use specialist tools, techniques, processes, equipment and machinery **with some accuracy**, including **computer-aided manufacture** LO: Correctly select and use tools, techniques, and machinery with accuracy	Y	Select and use specialist tools, techniques, processes, equipment and machinery **precisely**, including **computer-aided manufacture with increasing/greater independence** LO: Correctly select and use tools, techniques, and machinery with precision	Y
	Cut to a **tolerance of +/- 5mm** L.O - Attempt to be accurate marking out and making	Y	Make changes while making to improve quality, finish and strength - work to a **tolerance of +/- 3mm.** LO: Cut and finish to a good tolerance (+/-3mm)	Y	Use machinery with accuracy, cutting and finishing closer to marking out - a **tolerance of +/- 2mm** LO: Cut and finish to a small tolerance (+/-2mm)	Y	Use tools, techniques, and machinery with precision - using appropriate tools to work to **minimal tolerances**. LO: Cut and finish to minimal tolerances (+/-1mm)	Y
	Use a range of materials and components, including construction materials, according to their functional properties and aesthetic qualities L.O -	Y	**Select from** and use a **wider range** of materials and components, **including construction materials**, according to their functional properties and aesthetic qualities	Y	Select from and use a **range of appropriate materials**, taking into account their **properties**	Y	Select from and use a **wider, more complex range of materials and components**, taking into account their **properties**	Y
Evaluate	Investigate a selection of **existing products** L.O - Look at existing products and discuss them	Y	Investigate and **analyse a range** of existing products	Y	**Consider** the work of past and present professionals and others to develop and broaden their understanding [designers] LO: Analyse the work of designers to develop understanding	Y	**Analyse** the work of past and present professionals and others to develop and broaden their understanding [design movements] LO: Research and present information about design movements	Y
		Y	Understand how key events and individuals in design and technology have helped shape the world [evolution of vehicles]	Y			Investigate new and emerging technologies	Y
	Evaluate their ideas and products against their own design criteria L.O - Compare your work with the design specification	Y	Evaluate their ideas and products against their own design criteria **and consider the views of others to improve their work.** Evaluate outcomes against initial designs	Y	**Test** and evaluate their ideas against a specification, **taking into account the views of intended users** LO: Evaluate a product against a specification	Y	Test, evaluate **and refine** their ideas **and products** against a specification, taking into account the views of intended users LO: Evaluate a product against a specification and suggest improvements	Y
							Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists [timelines] LO: Understand developments in design and technology	Y
Technical Knowledge required	Strengthen and reinforce structures L.O - Investigate how to make a material stronger by adding bracing	Y	Apply their understanding of how to strengthen, stiffen and reinforce **more complex structures.** To explain and use triangulaion in a structure	Y	Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions **[different materials]**	Y	Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions **[different materials]**	Y
			Understand and use mechanical systems in their products. To describe how gears and gear trains transmit power	Y	Understand how more advanced mechanical systems used in their products enable changes in movement and force [use of equipment, levers] LO: Understand how more advanced mechanical systems could be used to enable changes in movement and force (Stand-alone)	Y		
			Understand and use electrical systems in their products. To describe how gears and gear trains transmit power	Y			Understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs] [motorising products?] LO: Understand how electrical and electronic systems can be powered and used in their products	Y
							Apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers] LO: Apply computing and use electronics to embed intelligence in products	Y
Subject specific vocabulary	design specification, research, reinforce, stability, temporary, permanent.		production, processes, industrial, prototype, professional, LED, Resistor, LED holders, battery clip, battery, switch, circuit, connection, connections, short circuit, insulator, package, triangulation, stability, temporary, permanent Equipment vocab: Pulley, gear, cells, anode , cathode, ohms, resistance,conductor, insulator, solar, sustainability, computer aided design (CAD)		Manufacture, production, processes, industrial, Etch, prototype, professional. Lever/cam/linkage element Laser cut design elements		CAD, Computer Aided Design, CAM, Computer Aided Manufacture, Laser cutting, etching, manufacture, production, processes, industrial, prototype, professional, Net, Tensol, solvent, safety, laminate, process, investment, industrial, mass production, metal work	
Practical projects	Simple make projects - with less design impact Wooden toy - simple - skills based No waste duck Puzzle Packaging/graphics	Y	Vehicle with electronics Plastic body (strip heating) / Cardboard body Wooden chassis Structure strengthening	Y	Wooden stand for phone/tablet or book A sustainable, biodegradable product that serves a purpose and function	Y	Metal insect/plant/flower project 2D design keyring with layers Laser cutting, joining with solvent	Y
Key designers/ makers	Ivar Bengtsson. Inventor of Brio train sets https://www.brio.uk/ https://www.brio.net/our-company/history https://www.etsy.com/uk/market/wooden_animal_toy		Paul Budnitz designer of the Munny vinyl toy- https://www.kidrobot.com/pages/about-paul-budnitz https://www.kidrobot.com/		Urban artists- for graphic influence https://lucy.beat13.co.uk/			