PRODUCT

NC	YEAR 7	YEAR 8	YEAR 9
Design	**Magic pen**	**Designer stakes**	**Ay up duck**
use research and exploration, such as the study of different cultures, to identify and understand user needs	Primary research methods. User needs. Pattern & Memphis design movement	Developing primary and secondary research methods. Identify the need of others	Primary and secondary research methods. Investigate he Industrial heritage of Stoke on Trent.
identify and solve their own design problems and understand how to reformulate problems given to them	Using a design brief	Developing design briefs.	Investigation of design possibilities. Working to a design brief.
develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations	Pen holder specification	Develop design specifications with regard to research analysis	Analysing research and developing a specification.
use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses	Using scrafitti and pattern in design of ideas	Use the work of others, moodboards and themes in order to produce creative ideas. Develop innovative ideas in response to 3rd party feedback.	Using themes and pattern to develop creative ideas that avoid design fixation.
develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools	2d design Process charts Production of templates 2D CAD	Communicate ideas through annotated sketches. Produce detailed production plans. Use models to solve design problems. 2D CAD	Development of ideas using a wide range of 2D/3D techniques in order to develop a prototype. Creation of digital design ideas
Make			
select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture	Using a template. Marking out and measuring. Developing practical skills to process Acrylic using workshop hand tools, pillar drill, hack saw, coping saw, fret saw, half round file, wet & dry and polisher. Production using a jig Production using a former CAM Laser cutting	Using a template. Marking out and measuring. Developing practical skills to process wood, metal and plastic using workshop hand tools, pillar drill, coping saw, fret saw, half round file, glass paper CAM Laser cutting. Industrial manufacturing techniques in metal using DXF files working with a local company.	Skill in the manufacture of high quality prototypes using traditional plastic and woodworking techniques. Using patterns, steel rules, try squares, bench hooks, tennon saws, coping saws, pillar drills, belt sanders, drilling jigs & hand drills. CAM laser cutting.

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select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties	Working with thermoplastics, understanding the properties of thermoplastics.	Working with wood, understanding the origins of natural wood and metals and their working properties.	Development of working with wood, understanding the origins of natural wood, plastic and properties.
Evaluate			
analyse the work of past and present professionals and others to develop and broaden their understanding	Analysis of the Memphis design movement.	Analysis of the work of others. Creating moodboards to develop understanding.	
investigate new and emerging technologies		Composite materials	CAD - CAM
test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups	Test and evaluate products against a specification. Evaluate products using 3rd party feedback.	Test and evaluate products against a specification. 3rd party testing and feedback.	Product testing Test and evaluate products against a specification. 3rd party testing and feedback.
understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists	Understanding the 6R's	Sustainability and materials from FSC sources	Finite & none finite resources & the impact of their use.
Technical Knowledge			
understand and use the properties of materials and the performance of structural elements to achieve functioning solutions	Understand the properties of plastics and how they are used to make products	Understand the properties of metal and how it are used to make products. Re visit the properties of plastics.	Understand the properties of wood and how it are used to make products. Understand the properties of composite materials.
understand how more advanced mechanical systems used in their products enable changes in movement and force		The functions of mechanical devices to produce linear, rotary, reciprocating and oscillating movements. Understand the impact of forces and stresses	

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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]	**Develop a key torch project?**		
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].		**Lego programming?**	