Nailsea School Curriculum Map – Design and Technology

		Topic Title	Key Skills	Content
Year 7		Engineering	• To understand and identify safe working practices • To be able to analyse products using ACCESSFM • To be able to use the correct tools and equipment for marking out and measuring • Working with accuracy and precision • Manufacturing	• Health and safety in the workshop, • Target market, function, customer requirements • Product analysis • Metals, their properties and uses • safe working practices • Identifying the correct tools and equipment for engineering processes • Marking out and measuring with accuracy • Testing • Working with accuracy • Manufacturing processes
		Sustainability	Teamwork • analytical skills • research skills • problem solving • designing • Prototyping • Self and Peer Evaluation Presentation skills (design ideas and verbal presentation)	• To find out about what sustainability is and why it is important. • The 6Rs of sustainability. • Difference between renewable and non-renewable resources. • How to be more sustainable in your own home and in school. • What is upcycling and how it is different from recycling, design examples of upcycling from old products and their materials. • Students will work in teams to research, design and make upcycled products from old products and materials. • Students will presentation their research, designs and products to the whole class. • Other types of sustainable resources such as use of solar energy, wind energy, hydro power and bioenergy. • Self and peer evaluation and improvement of outcomes (what went well, even better if…)
		Food	• Basic cooking skills • Recognising a variety of fruit and vegetables • To be able to identify and use specialist terms • Applying knowledge of nutrition to their own food choices	• Introduction to safe working practices • Understanding and following H&S procedures, room procedures, personal hygiene, washing up, knife safety, high risk ingredients, team-work • Weighing and measuring, precision knife skills, bridge and claw grip, rubbing in, use of hob and oven, all in one cake method, all in one sauce, grating and juicing, electric hand blender • Digestion, vitamins and minerals, Eatwell Guide • Commodities - fruit and vegetables • Benefits of 'Grow your own' to the individual and the environment • Food science – enzymic browning • Soup tasting – sensory analysis and vocabulary
		Electronics	• Identifying electronic components • creating circuits • programming & coding circuits • problem solving • calculating voltage, current and resistance (ohms law) Using sensors to automate systems	• Identify electronics components and be able to draw their circuit symbol • Group components into inputs & outputs • Draw simple circuits in series and parallel • Calculate ohms law values • Build and program a range of simple circuits • Problem solve various tasks using coding • Be able to write a flow diagram to represent the logic of code • Learn how to solder printed circuit boards
		Glass	• To be able to draw using the Isometric technique	• Recognising drawing in isometric projection. Using isometric paper to draw shapes in isometric. Creating a design based on the work of Mondrian including characteristics of his artwork.

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			• Learning about the work of others - Mondrian • Glass theory – how it is made	• Recognising the characteristics of Mondrian's artwork and successfully using this within their own design work. • Understanding the materials and equipment used to make glass. Recognising and naming the specific techniques used to create a variety of shaped pieces and flat glass. • Understand the difference in scales of production when it comes to glass making, one-off and mass production. • Understanding the importance of packaging, to protect the product, manufacture, distribution and advertising/marketing. Recognise and name symbols that we see on packaging, understand what they are for.
Year 8		Topic Title	Key Skills	Content
		Graphics	• To be able to identify the correct equipment used for graphics • Pencil control • To be able to draw using a range of techniques • To understand the types of papers and boards used for everyday products • To understand and be able to create typography	• Understanding of how graphics are used everyday • Identifying the correct tools and equipment for graphics • The function of packaging and logos • Papers and boards, their properties and uses • Practice drawing skills, using a range of drawing techniques including isometric and two point perspective • The work of others, the work of a draughtsman – Harry Beck [London Underground], iconic architecture and architects • Architectural drawings and practice • Understanding and creating typography
		Design and Technology - mechanisms	• Analytical skills (design brief), • Research skills, • problem solving skills, designing. • Use of CAD and CAM to create designs • Making (safe and correct use of tools and equipment • Self and peer evaluation, presentation skills (design ideas)	• Design specification using ACCESSFM. • Understand and given example of four basic types of motion. • Understand and create a knowledge poster of six types of mechanisms, the types of motion produced and examples. • Research of existing products with explanations of the how these products help inspire new possible designs. • Presentation and explanation of design ideas and choice/decisions) that meet the needs of the customer and the requirements from the design specification. • Lifecycle of products, application to a children's toy • Types of wood, natural and manufactured and their properties • Use of CAD (2D design) and CAM (laser cutter) to produce unique parts. • Correct and safe use of pillars drill (general health and safety practices in the workshop) • Making, assembly and adding decoration to parts for the children's toy. • Self and peer evaluation and improvement of outcomes (what went well, even better if…)
		Food	• To understand and be able to apply rules of food safety • Communication – stylised drawing – presentation drawing • Precision knife skills • Identifying food poisoning bacteria • Understanding a recipe	• Food safety - 4Cs, cooking, cleaning, chilling, cross contamination • Design a vegetarian stir fry • Understand that different bacteria have diverse onset times, causes, symptoms and duration times and that different groups are vulnerable • Precision knife skills – julienne, brunoise, chiffonade, batons, macedoine. Safety, precision, speed. • Commodities – eggs • Food science – protein denaturation, transfer of heat, gluten production • Cake making – melting and whisking methods, reduced sauce, stir frying, rolling and shaping pastry, handling raw meat, bread dough, cooking methods
		CADCAM	• Designing ideas • Product analysis Specification writing	• Research and analyse existing USB designs using ACCESS FM criteria • Write a specification for your USB • To design a range of USB ideas

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			• modelling of ideas • Design development • Understand how to operate CAD • Evaluation	• To model a prototype of one idea • Evaluate model and identify developments • Use CAD to design a final idea to scale ready for 3D printing • Evaluation of ideas against a specification
		Textiles	• To understand and be able to write a design brief and specification • To be able to identify natural and synthetic fibres • To be able to identify the fibre properties of cotton and polyester • To be able to identify the 'Work of Others' • Knitting, weaving and bonding • SMART/technical fabrics	• Understanding how to write a brief and specification, what the purpose of them both is and how they are used in the design process. Understanding the importance of a well written brief and specification as it informs the entire design process to ensure the final design is fit for purpose. • Knowing the origin of fibres and being able to give examples of both natural and synthetic fibres. • Understanding the different properties of fibres. Knowing that cotton is absorbent and therefore also stains easily. Knowing polyester in not absorbent and therefore is resistant to stains. Being able to explain how and why. • Recognising the brand logo of Coco Chanel and the journey of Gabrielle Chanel in creating the brand. Understanding how designers use inspiration from life events in the creation of their work. • Knowing the difference between a knitted, woven and bonded fabric, Understanding the process to construct these fabrics and the properties. Being able to label diagrams with keywords. Naming the 3 most common weave structures. Understanding he difference between weft and warp knitting. • Recognising types of SMART and Technical textiles, being able to explain their properties and benefits to the user. Knowing the types of garment the fabric has been produced to be used for and why.
Year 9		Topic Title	Key Skills	Content
		Textiles	• Understanding fibres, to be able to identify their properties and uses • Practice tie-dye techniques, by creating samples • Safe and independent use of the sewing machines • Fabric construction, to be a produce samples • Identifying the work of fashion designers	• Designing, colour rendering, quality presentation • Textiles components + trims • Natural, Synthetic + Regenerated • Blended + Mixed fibres • Fibre properties (more advanced than yr8) and uses • Dyeing and Printing – tie dying techniques • Fabric construction • Safe use of tools and equipment • Identifying the correct tools and equipment for textiles • The Work of Others, William Morris, Vivienne Westwood, Coco Chanel, Mary Quant
		Engineering	• Analytical skills (design brief) • Research skills • problem solving skills designing • Use of CAD and CAM to create designs • Marking and measuring skills, use of appropriate tools and equipment • Importance of health and safety, risks, hazards and precautions. • Making (safe and correct use of tools and equipment, • Self and peer evaluation, presentation skills.	• Specification using the concepts of ACCESSFM. Initial design ideas, focus on suitability of designs to meet requirements of design brief • Use of CAD (2D design) to create mould for padlock • Research on types of metals (Ferrous and Non-Ferrous), selection of appropriate metals and their properties. • Homework research task on composite materials • Preparation of mould in readiness for casting, use of appropriate marking and measuring tools. Importance of quality checking and quality control. • Research on types of casting methods (gravity, sand and die injection. Importance of health and safety, risks, hazards and precautions. • Correct and safe use of drilling (pillar drill) and cutting (jig saws) equipment. Importance of health and safety, risks, hazards and precautions. • Finishing techniques, filing, use of wet/dry paper, wire wool, etc • Use of jigs to correctly carry out practical tasks • Correct use of taps and dies to form threads • Assembly and completion of padlock

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				• Use precise measuring equipment (verniers) to check that padlock measurement meet with the requirements of the specification • Evaluation
		Food	• Develop independent cooking skills • Compare cuisines, understanding the reasons and links • Benefits of a Mediterranean diet History and food fashions	• Understand the factors to take into account when designing food products. Design a pizza showing an understanding of dietary needs, allergens, food packaging information and dietary needs. • Be able to read a food package and understand the information that it contains eg traffic light system • Research skills – research 2 or more countries and compare their climate, cultures and cuisine • Independent research – history and popularity / origins of fast food – brand identity of a fast food restaurant • Mediterranean diet – show understanding in Pizza design
		Design and Technology	• Designing ideas, isometric projection • Materials knowledge • Measuring and marking materials, wasting materials, joining materials, circuit building • CAD design • CAM manufacture	• Designing a range of ideas • Materials knowledge for softwoods & hardwoods, thermoforming plastics and thermosetting plastics • Knowledge of hand tools and machinery, jigs and templates • Scales of production – one off to mass • CAD- convert idea into 2d vector model • CAM- laser cut polymer • Hand tools – measure and mark a wooden frame using finger joints, tenon saws and routers