Newman Catholic Collegiate
Progression of Skills Document – 2024 - 2025

DESIGN	**Key Stage One :** _design purposeful, functional, appealing products for themselves and other users based on design criteria _generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology	**Key Stage Two: -** -use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups -generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design **Key Stage 3** -generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design use research and exploration, such as the study of different cultures, to identify and understand user needs- identify and solve their own design problems and understand how to reformulate problems given to them -develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations -use a variety of approaches [for example, biomimicry and user-centred design],to generate creative ideas and avoid stereotypical responses -develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools

	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2		
EYFS	Year one	Year Two	Year Three	Year Four	Year 5	Year 6	Year 7

*Select appropriate resources *Use gestures, talking and arrangements of materials and components to show design * Use contexts set by the teacher and myself *Use language of designing and making (join, build, shape, longer, shorter, heavier etc.)	Describe what they want to do using pictures and words Make lists of materials they will need Think of some ideas of their own Explain what they are making	Generate ideas through comparing existing products To design their product using pictures and words Say how the product will be useful to the user	Plan their design, using diagrams and labels To have a design-criteria and establish a purpose/ audience for their product. use what they know about the properties of materials to plan their ideas.	Create a detailed plan considering their target audience, design criteria and intended purpose? Collect and use information to generate ideas. Understand designs must meet a range of criteria. Include accurate measurements within the design.	Suggest some alternative designs and compare the benefits and drawbacks to inform the design process and outcome. Make up a prototype first. To be able to use computer-aided design to enhance their product. To include different view perspectives within one design e.g bird's eye view, third angle perspective.	Use a range of information to inform their design Use market research to inform plans Keep cost constraints in mind when selecting materials in design Use their knowledge of science and art when designing. To be design showing the product from a range of angles including exploded diagrams.	Students will be introduced to the Product Design workshop and the various safety requirements. They will learn the importance of Product Design in society and they will produce their first design brief for a client (currently Argos). Students will continue with research for their project and learn techniques to help generate and develop design ideas. Drawing/Rendering skills will be covered as these are essential as they progress in design. Produce a final design fully annotated including measurements and materials (numeracy skills). Graphic Design is and why it is important within everyday life and industry. Students will then begin a skills booklet focussing on the Develop of

							practical drawing skills, in particular: •Colour Theory. •Colour messages. •Rendering. •Isometric and oblique shapes. •Rendering techniques: cross-hatching, vertical lines, dots. •Adding shadows to an object.

Make	**Key Stage One :** -select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing) -select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics		**Key Stage Two:** -select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately -select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities **Key Stage Three:** -select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture -select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties				
EYFS	Year One	Year Two	Year Three	Year Four	Year 5	Year 6	Year 7
*Construct with a purpose, using a variety of resources *Use simple tools and techniques *Build / construct with a wide range of objects *Select tools & techniques to shape, assemble and join *Replicate structures with materials / components *Discuss how to make an activity safe and hygienic *Record experiences by drawing, writing, voice recording *Understand different media can be combined for a purpose	> Make a product which moves. > To be able to make safe cuts and shape using scissors. > To be make their own design.	> To use non-standard units of measure in creation. > To be able to make safe cuts into a range of shapes using scissors. > Children to start to adapt and refine their projects from their design.	> Children to start to measure using centimetres in their creation. > Children to use different and appropriate tools safely – sharper knives, > Children to proactively adapt and refine their projects from their design. > Children to pick and use appropriate resources and materials.	Children to make accurate measurements in their creation. Children to be able to pick choose and appropriate tools and use safely. To be able to adapt and refine their projects from their design when they face obstacles with teacher prompt.	To build projects using markings and measurements. Children to use a range of tools to get different effects in their creation. Children to adapt plans based on obstacles that arise in creation.	To a build successful project based on appearance, function and user. Children to continue to use a range of tools for different effects safely. Children to adjust projects accordingly when obstacles arise without prompt.	Materials research – Students will study materials that they will be using for the product (Various woods and plastics). What properties do they have? Where do they come from? What makes them suitable for our product? They will then produce a final design fully annotated including measurements and materials (numeracy skills). Modelling – Students will learn to model their design ideas to eradicate any issues before they

							begin manufacture of their final product (Wall clock) They will produce a plan for manufacture. Practical lessons – Laser Cutting / Coping saws Students will learn how to use machines and equipment safely and sensibly to manufacture their products. They will learn to work as a team and peer assess each other's work. Assembly of product – Students will learn the correct way to join and assemble products depending on the type of material used. Correct glues etc.

Evaluate

Key Stage One:

-explore and evaluate a range of existing products

-evaluate their ideas and products against design criteria

Key Stage Two

- investigate and analyse a range of existing products evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- understand how key events and individuals in design and technology have helped shape the world-

Key Stage Three:

-analyse the work of past and present professionals and others to develop and broaden their understanding investigate new and emerging technologies
-test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups-
-understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists

EYFS	Year one	Year Two	Year Three	Year Four	Year 5	Year 6	Year 7
*Adapt work if necessary *Dismantle, examine, talk about existing objects/structures *Consider and manage some risks *Practise some appropriate safety measures independently *Talk about how things work *Look at similarities and differences between existing objects / materials / tools *Show an interest in technological toys *Describe textures	Children to be able to describe what they have made. Children to be able to say what they like about their product.	Children to describe what they have made and how they have made it. Children to say what they like about their product and what would they change next time. Children decide if their product is appropriate for their chosen user.	Children to explain why their product is or isn't appropriate for the intended user. Children to be able to discuss the skills they have used in their product creation. Children to evaluate their product based on their design criteria.	Children to evaluate the effectiveness of their product against the design criteria. Children to explain the drawbacks during the creation process and how they were able to overcome it. Children to explain in detail the product's suitability for its user.	Children to evaluate the quality and effectiveness of their design Children to evaluate how they could have prevented the drawbacks they faced during their creation. Children to suggest modifications and improvements for their product.	Children to self-assess and peer assess each other's work and produce a basic evaluation with guidance. Children to evaluate ways they overcame drawbacks and explain in detail what they would do differently in future products.	Students will self-assess and peer assess each other's work and produce a short evaluation.
	•						

Technical Knowledge	**Key Stage One :** - build structures, exploring how they can be made stronger, stiffer and more stable - explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.	**Key Stage Two** understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] apply their understanding of computing to program, monitor and control their products. **Key Stage 3** understand and use the properties of materials and the performance of structural elements to achieve functioning solutions understand how more advanced mechanical systems used in their products enable changes in movement and force 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] 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].

Technical knowledge - Mechanisms

	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2		Key Stage 3
EYFS	Year One	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
	Make a product which moves using levers and sliders. •Say why they have chosen moving parts. • Know how some moving objects work.	. Join materials together as part of a moving product. • Explain how different parts move Make a moving model that uses wheels, and axles. • Talk about how moving objects work.	Make a product which uses mechanical components. (Levers and linkages)	Make a product which uses pneumatics		Create designs that include cams, gears or pulleys.	N/A

• Technical Knowledge - Electrical Components							
				•make a simple circuit and add components to it • Add electricity to create motion or make light. To know how to make a range of simple secure connections (twisting wires together, wrapping ends, taping over, connecting block)		• Use a number of components in a circuit e.g. light, buzzer, motor • Use different kinds of circuits in their product to improve it. E.g. series, parallel • Incorporate a switch into their products • assess faults in their own electrical systems • test components in a simple series circuit • use computer programming to control a circuit. (Crumble, Microbits and TinkerCAD).y	Students complete an Electronics 'LED mask project' in Y7/8 The students will learn how to solder using a soldering iron to enable them to join electronic components together. They will produce a circuit with up to 5 LEDs, a switch, and a battery holder. They then design and produce a mask made from coloured neoprene foam which will house the circuit.
Technical Knowledge – Textiles							

		• Understand how simple 3-D textile products are made, using a template to create two identical shapes. • join fabrics using different techniques with easy thread (large eye) needles e.g. running stitch, glue, stapling. • Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons.		investigate a range of textile products that have a selection of stitches, joins, fabrics, finishing techniques, fastenings and purposes, linked to the product they will design, make and evaluate. . disassemble appropriate textiles products to gain an understanding of 3-D shape, patterns and seam allowances. strengthen, stiffen and reinforce existing fabrics. Understand the need for patterns and seam allowances. securely join two pieces of fabric together using a range of stitching techniques, running stitch (Y1), over-stitch and blanket stitch. Glue gun if necessary.		Be able to thread a needle (smaller eye than Y1) • Develop skills of sewing textiles by joining right side together and making seams. investigate how to sew and shape curved edges by snipping seams, tack or attach wadding or stiffening learn how to start and finish off a row of stitches To be able to use an appropriate stitch learned for a given task. pin a pattern on to fabric ensuring limited wastage, leave a seam allowance use different cutting techniques. Develop skills of computer-aided design (CAD) by using on-line pattern making software to generate pattern pieces.	N/A
Structures							
make a freestanding structure from simple blocks/boxes know how to make a	make freestanding structures stronger, stiffer and more stable.		Use more sophisticated methods for stiffening/strengthening structures using triangulation. Use a 2D net to create a 3D structure.		stiffen, strengthen and reinforce a range of 3-D frameworks know which materials are best suited to stiffen and reinforce by selecting	•	

structure taller make a structure more stable	join some simple materials using glue, tape, blue tack, staples, paper clips know a simple order of making a structure		Use tools appropriate for cutting and scoring materials (rulers and scissors). test a material's strength use CAD to develop a product (TinkerCAD).		them due to their properties know which shapes are the strongest and will support the most weight in a structure use a range of tools i.e. junior hacksaws, G-clamps, bench hooks, hand drills safely		

Cooking and Nutrition	**Key stage 1** use the basic principles of a healthy and varied diet to prepare dishes understand where food comes		**Key stage 2** understand and apply the principles of a healthy and varied diet prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed **Key stage 3** -understand and apply the principles of nutrition and health cook a repertoire of predominantly savoury dishes so that they are able to feed themselves and others a healthy and varied diet -become competent in a range of cooking techniques [for example, selecting and preparing ingredients; using utensils and electrical equipment; applying heat in different ways; using awareness of taste, texture and smell to decide how to season dishes and combine ingredients; adapting and using their own recipes] - understand the source, seasonality and characteristics of a broad range of ingredients.				
EYFS	Year one	Year Two	Year Three	Year Four	Year 5	Year 6	Year 7
Begin to understand some food preparation tools, techniques and processes *Practise stirring, mixing, pouring, blending *Discuss how to make an activity safe and hygienic *Discuss use of senses *Understand need for variety in food *Begin to understand that eating well contributes to good health	*describe textures *wash hands & clean surfaces *describe differences between some food groups (i.e. sweet, vegetable etc.) *discuss how fruit and vegetables are healthy Understand how to hold a knife safely. To cut through soft ingredients.	*explain hygiene and keep a hygienic kitchen *describe properties of ingredients and importance of varied diet To cut through different ingredients. To be able to spread, grate a range of ingredients.	*use equipment safely *make product look attractive *to reference how food and drink are needed for active/healthy bodies to build onto scientific knowledge. *grow in confidence using some of the following techniques: sieving, mixing, combining, kneading, rolling and baking Under supervision, to be able to use a relevant cooking method - i.e. baking, frying, boiling…	To be safe and hygienic within a kitchen setting. *think about presenting product in interesting/ attractive ways *understand ingredients can be fresh, pre-cooked or processed *begin to understand about food being grown, reared or caught in the UK or wider world To consider the different groups in the creation of dishes. *use some of the following techniques: peeling, crushing, chopping, slicing, grating, mixing, combining, shaping	To independently put safety and hygienic methods into practice. *present product well - interesting, attractive, fit for purpose *begin to understand seasonality of foods *understand food can be grown, reared or caught in the UK and the wider world *describe how recipes can be adapted to change appearance, taste, texture, aroma *prepare and cook a seasonal dish safely and hygienically. *accurately weigh, measure and combine ingredients * use range of techniques such as mixing, , kneading, rolling baking,	*understand a recipe can be adapted by adding / substituting ingredients *explain seasonality of foods *name some types of food that are grown, reared or caught in the UK or wider world *adapt recipes to change appearance, taste, texture or aroma. Prepare a dish that contributes a healthy varied diet. *prepare and cook a savoury dish safely and hygienically including using a hob as a heat source. *choose an appropriate	Equipment, Processes and Skills Pupils utilise the Food workbook to complete a range of theory activities around the themes of Equipment, Processes and Skills. Pupils will complete practical work which allows them to implement their knowledge of utilising Equipment, Processes and Skills. Hygiene & Safety. Pupils will complete **practical** work which allows them to implement Hygiene and Safety practices. *Food Sources & Availability and Sensory/Organoleptic Evaluation* Pupils utilise the Food workbook to complete a range of **theory** activities focussing on where food ingredients are sourced, how ethically and sustainably they are sourced and how the

						technique in preparation of dishes from already learnt practice. Use a range of cooking techniques; fry/sauté, simmer/boil/bake	senses are used to judge foods in relation to customer acceptability. Pupils utilise the Food workbook to complete a range of **theory** activities which focus around effective nutrition and healthy eating. Pupils will complete **practical** work which allows them to consider effective nutrition in practice and to further their utilisation of Hygiene & Safety in practice, Independence and Competency.