



Saint Joseph's Catholic Academy Progression of Skills Document



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

Year one	Year Two	Year Three	Year Four	Year 5	Year 6	Year 7
<p>Year one</p> <p>Describe what they want to do using pictures and words</p> <ul style="list-style-type: none"> • Make lists of materials they will need • Think of some ideas of their own • Explain what they are making • Plan an outcome through pictures with labels 	<p>Year Two</p> <ul style="list-style-type: none"> • Generate ideas through comparing existing products • Describe their design by using pictures, diagrams, and words • Say how the product will be useful to the user • Start to describe how a commercial product works 	<p>Year Three</p> <ul style="list-style-type: none"> • Plan their design, using diagrams and labels • Plan the equipment/ tools needed and give reasons why? • Start to order the main stages of making their product • Design criteria and establish a purpose/ audience for their product. • use what they know about the properties of materials to plan their ideas. • Make use of ICT to plan ideas • Recognise that designs must meet a range of needs, • Apply what they know about mechanisms to create movement when planning and designing. 	<p>Year Four</p> <ul style="list-style-type: none"> • Create a final design for their product based on initial ideas and revisions, based on existing ideas. • Create a detailed plan considering their target audience, design criteria and intended purpose • Collect and use information to generate ideas. • Consider the way the product will be used when planning. • Understand designs must meet a range of criteria. • Make ongoing sketches and annotations and constraints • Think ahead about the order of their work 	<p>Year 5</p> <ul style="list-style-type: none"> • Survey their target audience and use this to generate ideas • Take a user’s view into account when designing • Produce a detailed step-by-step plan for their design method • Suggest some alternative designs and compare the benefits and drawbacks to inform the design process and outcome. • Use sketches to show other ways of doing things – and then make choices between designs. • Make up a prototype first. 	<p>Year 6</p> <ul style="list-style-type: none"> • Use a range of information to inform their design • Use market research to inform plans • Work within constraints. • Justify their plan to someone else • Keep cost constraints in mind when selecting materials in design • Use their knowledge of science and art when designing. • Draw scaled diagrams with increasing use of ratio. • Calculate the amount of materials needed use this to estimate cost. • Consider the use of the product when selecting materials • Make up a prototype first 	<p>Year 7</p>

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
*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	*explain what I'm making and why *consider what I need to do next *select tools/equipment to cut, shape, join, finish and explain choices *measure, mark out, cut and shape, with support *choose suitable materials and explain choices *try to use finishing techniques to make product look good *work in a safe and hygienic manner	*explain what I am making and why it fits the purpose *make suggestions as to what I need to do next. *join materials/components together in different ways *measure, mark out, cut and shape materials and components, with support. *describe which tools I'm using and why *choose suitable materials and explain choices depending on characteristics. *use finishing techniques to make product look good *work safely and hygienically	*select suitable tools/equipment, explain choices; begin to use them accurately * select appropriate materials, fit for purpose. * work through plan in order *consider how good product will be * begin to measure, mark out, cut and shape materials/components with some accuracy * begin to assemble, join and combine materials and components with some accuracy * begin to apply a range of finishing techniques with some accuracy	* select suitable tools and equipment, explain choices in relation to required techniques and use accurately *select appropriate materials, fit for purpose; explain choices * work through plan in order. * realise if product is going to be good quality * measure, mark out, cut and shape materials/components with some accuracy *assemble, join and combine materials and components with some accuracy *apply a range of finishing techniques with some accuracy	* use selected tools/equipment with good level of precision * produce suitable lists of tools, equipment/materials needed *select appropriate materials, fit for purpose; explain choices, considering functionality * create and follow detailed step-by-step plan * explain how product will appeal to an audience * mainly accurately measure, mark out, cut and shape materials/components *mainly accurately assemble, join and combine materials/components * mainly accurately apply a range of finishing techniques * use techniques that involve a small number of steps * begin to be resourceful with practical problems	* use selected tools and equipment precisely *produce suitable lists of tools, equipment, materials needed, considering constraints * select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics * create, follow, and adapt detailed step-by-step plans *explain how product will appeal to audience; make changes to improve quality * accurately measure, mark out, cut and shape materials/components * accurately assemble, join and combine materials/components * accurately apply a range of finishing techniques	

						<ul style="list-style-type: none">* use techniques that involve a number of steps* be resourceful with practical problems	
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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
*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	*talk about my work, linking it to what I was asked to do * talk about existing products considering: use, materials, how they work, audience, where they might be used *talk about existing products, and say what is and isn't good * talk about things that other people have made *begin to talk about what could make product better	* describe what went well, thinking about design criteria * talk about existing products considering: use, materials, how they work, audience, where they might be used; express personal opinion *evaluate how good existing products are *talk about what I would do differently if I were to do it again and why	* look at design criteria while designing and making *use design criteria to evaluate finished product * say what I would change to make design better *begin to evaluate existing products, considering: how well they have been made, materials, whether they work, how they have been made, fit for purpose * begin to understand by whom, when and where products were designed * learn about some inventors/designers/ engineers/chefs/ manufacturers of ground-breaking products	*refer to design criteria while designing and making *use criteria to evaluate product * begin to explain how I could improve original design *evaluate existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose * discuss by whom, when and where products were designed * research whether products can be recycled or reused * know about some inventors/designers/ engineers/chefs/manufacturers of ground-breaking products	*evaluate quality of design while designing and making *evaluate ideas and finished product against specification, considering purpose and appearance. *test and evaluate final product * evaluate and discuss existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose * begin to evaluate how much products cost to make and how innovative they are *research how sustainable materials are *talk about some key inventors/designers/ engineers/ chefs/manufacturers of ground-breaking products	*evaluate quality of design while designing and making; is it fit for purpose? * keep checking design is best it can be. *evaluate ideas and finished product against specification, stating if it's fit for purpose *test and evaluate final product; explain what would improve it and the effect different resources may have had *do thorough evaluations of existing products considering: how well they've been made, materials, whether they work, how they've been made, fit for purpose *evaluate how much products cost to make and how innovative they are *research and discuss how sustainable materials are *consider the impact of products beyond their intended purpose	

						*discuss some key inventors/designers/ engineers/ chefs/manufacturers of ground-breaking products	
	<ul style="list-style-type: none">•						

Technical Knowledge	<p>Key Stage One :</p> <ul style="list-style-type: none"> - 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. 	<p>Key Stage Two</p> <ul style="list-style-type: none"> 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. <p>Key Stage 3</p> <ul style="list-style-type: none"> 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].
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Technical knowledge - Mechanisms

EYFS	Year One	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
	<p>Make a product which moves using levers and sliders.</p> <ul style="list-style-type: none"> • Say why they have chosen moving parts. • Know how some moving objects work. 	<p>. Join materials together as part of a moving product.</p> <ul style="list-style-type: none"> • Explain how different parts move <p>Make a moving model that uses wheels, and axels.</p> <ul style="list-style-type: none"> • Talk about how moving objects work. 	<p>Make a product which uses mechanical components. (Levers and linkages)</p>			<p>Create designs that include cams, gears or pulleys.</p>	

• Technical Knowledge - Electrical Components

				<ul style="list-style-type: none"> • Develop computer aided design skills and use CAD to create the final design of a simple electrical circuit, making necessary changes before building the physical circuit. • Make a simple circuit and add components to it • Add electricity to create motion or make light. • Make a product which uses both electrical and mechanical components. <p>To know how to make a range of simple secure connections (twisting wires together, wrapping ends, taping over, connecting block)</p>		<ul style="list-style-type: none"> • 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. 	
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Technical Knowledge – Textiles

		<ul style="list-style-type: none"> • Understand how simple 3-D textile products are made, using a template to create two identical shapes. • join fabrics using different techniques e.g. running stitch, glue, over stitch, stapling. • Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons. 		<p>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. .</p> <p>disassemble appropriate textiles products to gain an understanding of 3-D shape, patterns and seam allowances.</p>		<ul style="list-style-type: none"> • Be able to thread a needle • 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 • Use a wider range of stitching techniques • . stem stitch, satin stitch, 	
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				<p>strengthen, stiffen and reinforce existing fabrics. Understand the need for patterns and seam allowances.</p> <p>securely join two pieces of fabric together using a range of stitching techniques, running stitch back stitch, blanket stitch, cross stitch</p> <p>Understand the need for patterns and seam allowances.</p>		<ul style="list-style-type: none"> Develop skills of 2-D paper pattern making using grid or tracing paper to create a 3-D dipryl mock-up of a chosen product. pin a pattern on to fabric ensuring limited wastage, leave a seam allowance use different cutting techniques. Investigate using art packages on the computer to design prints that can be applied to textiles using iron transfer paper. 	
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Structures

<p>make a freestanding structure from simple blocks/boxes</p> <p>know how to make a structure taller</p> <p>make a structure more stable</p>	<ul style="list-style-type: none"> make freestanding structures stronger, stiffer and more stable join some simple materials using glue, tape. know a simple order of making a structure use simple finishing techniques to complete their structure know vocabulary relevant to the project 		<p>Use more sophisticated methods for stiffening/strengthening structures</p> <p>know what a 2D net is</p> <p>Use tools appropriate for cutting and scoring materials</p> <p>test a material's strength</p> <p>use CAD to develop a product</p>		<ul style="list-style-type: none"> stiffen, strengthen and reinforce a range of 3-D frameworks know which materials are best suited to stiffen and reinforce by selecting 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 	
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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
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 *think of interesting ways to decorate food *say where some foods come from, (i.e. plant or animal) *describe differences between some food groups (i.e. sweet, vegetable etc.) *discuss how fruit and vegetables are healthy *cut, peel and grate safely, with support	*explain hygiene and keep a hygienic kitchen *describe properties of ingredients and importance of varied diet *say where food comes from (animal, underground etc.) *describe how food is farmed, home-grown, caught *draw eat well plate; explain there are groups of food *describe “five a day” *cut, peel and grate with increasing confidence	carefully select ingredients *use equipment safely *make product look attractive *think about how to grow plants to use in cooking *begin to understand food comes from UK and wider world *describe how healthy diet= variety/balance of food/drinks *explain how food and drink are needed for active/healthy bodies. *prepare and cook some dishes safely and hygienically *grow in confidence using some of the following techniques: peeling, chopping, slicing, grating, mixing, spreading, kneading and baking	explain how to be safe/hygienic *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 *describe eat well plate and how a healthy diet=variety / balance of food and drinks *explain importance of food and drink for active, healthy bodies *prepare and cook some dishes safely and hygienically *use some of the following techniques: peeling, chopping, slicing, grating, mixing, spreading, kneading and baking	*explain how to be safe / hygienic and follow own guidelines *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 *explain how there are different substances in food / drink needed for health *prepare and cook some savoury dishes safely and hygienically including, where appropriate, use of heat source * use range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.	*understand a recipe can be adapted by adding / substituting ingredients *explain seasonality of foods *learn about food processing methods *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. *describe some of the different substances in food and drink, and how they can affect health *prepare and cook a variety of savoury dishes safely and hygienically including, where appropriate,	

						<p>the use of heat source.</p> <p>*use a range of techniques confidently such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.</p>	
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