

National curriculum end of EYFS expectations:

It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, self-expression, vocabulary and ability to communicate through the arts. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to and observe.

Expressive Arts and Design

ELG:

Creating with Materials Children at the expected level of development will:

- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function;
- Share their creations, explaining the process they have used;
- Make use of props and materials when role playing characters in narratives and stories.

St. James
C. of E. PRIMARY SCHOOL

Progression of Skills for DT

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making.

(National Curriculum)



National curriculum end of KS1 expectations:

Design

- 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

Make

- Select from and use a range of tools and equipment to perform practical tasks
- Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

Evaluate

- Explore and evaluate a range of existing products
- Evaluate their ideas and products against design criteria

Technical vocabulary

- Build structures, exploring how they can be made stronger, stiffer and more stable
- explore and use mechanisms

National curriculum end of KS2 expectations:

Design

- 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

Make

- Select from and use a wider range of tools and equipment to perform practical tasks 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

Evaluate

- 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

Technical vocabulary

- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- Understand and use mechanical systems in their products
- understand and use electrical systems in their products
- apply their understanding of computing to program, monitor and control their products

		Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Structures	Design	-Making plans, models and material choices.	-Learning the importance of a clear design criteria. -Talking about ideas, with purpose and user in mind.	-Generating and communicating ideas using sketching and modelling.	-Designing a castle with key features to appeal to a specific person/purpose. -Drawing and labelling a castle design using 2D shapes -Designing and/or decorating a castle tower on CAD software.	-Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect. -Building frame structures designed to support weight.		-Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs.
	Make	-Considering choice of materials. -Improving fine motor/scissor skills -Joining materials in a variety of ways -Describing their models/ideas	Making stable structures from card, tape and glue. - Creating a variety of cutting and joining techniques to make a stable structure.	-Making a structure according to design criteria. - Creating joints and structures from paper/card and tape. -Building a strong and stiff structure by folding paper.	Constructing a range of 3D geometric shapes using nets. -Creating special features for individual designs. -Making facades from a range of recycled materials.	-Creating a range of different shaped frame structures. - Making a variety of free-standing frame structures of different shapes and sizes. - Reinforcing corners to strengthen a structure. -Creating a design in accordance with a plan.		-Building a range of play apparatus structures drawing upon new and prior knowledge of structures. Using a range of materials to reinforce and add decoration to structures.

	Evaluate	-Giving verbal evaluations for their own and others' designs/models -Checking if their creating matches their plan -Evaluating the effectiveness of their creation -Testing and investigating their model.	-Explaining what they like about their peers' designs and products. -Recognising and accepting feedback and understanding it is meant to improve their work.	-Testing the strength of own structure. -Identifying the weakest part of a structure. -Evaluating the strength, stiffness and stability of own structure.	-Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design. -Suggesting points for modification of the individual designs.	-Evaluating structures made by the class. -Describing what characteristics of a design and construction made it the most effective. -Considering effective and ineffective designs.		-Improving a design plan based on peer evaluation.
	Technical knowledge		- To understand that the shape of materials can be changed to improve the strength and stiffness of structures. - To understand that cylinders are a strong type of structure - To begin to understand different structures and their purposes. - To know that a structure is something that has been made and put together.	- To know that shapes and structures with wide, flat bases or legs are the most stable. -To understand that the shape of a structure affects its strength. -To know that materials can be manipulated to improve strength and stiffness. -To know that a structure is something which has been formed or made from parts. -To know that a 'stable' structure is one which is firmly fixed and	-To understand that wide and flat based objects are more stable. -To understand the importance of strength and stiffness in structures.	-To understand what a frame structure is. - To know that a 'free-standing' structure is one which can stand on its own.		-To know that structures can be strengthened by manipulating materials and shapes.

				unlikely to change or move. - To know that a 'strong' structure is one which does not break easily. -To know that a 'stiff' structure or material is one which does not bend easily				
Mechanisms/mechanical systems	Design		-Explaining how to adapt mechanisms, using bridges or guides to control the movement. -Designing a vehicle that includes wheels, axles and axle holders, that when combined, will allow the wheels to move.	-Selecting a suitable linkage system to produce the desired motion. -Designing a wheel, creating a class design criterion for a moving monster, designing a moving monster for a specific audience in accordance with a design criteria.	-Designing a toy which uses a pneumatic system. - Developing design criteria from a design brief. -Generating ideas using thumbnail sketches and exploded diagrams. - Learning that different types of drawings are used in design to explain ideas clearly.	-Designing a shape that reduces air resistance. Drawing a net to create a structure from. Choosing shapes that increase or decrease speed as a result of air resistance. Personalising a design.		-Experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement. -Understanding how linkages change the direction of a force. -Making things move at the same time.

	Make		-Following a design to create moving models that use levers and sliders. -- Adapting mechanisms, when they do not work as they should, to fit their vehicle design, to improve how they work after testing their vehicle.	-Selecting materials according to their characteristics. -Following a design brief. - Making linkages using card for levers and split pins for pivots. - Experimenting with linkages adjusting the widths, lengths and thicknesses of card used. -Cutting and assembling components neatly.	-Creating a pneumatic system to create a desired motion. -Building secure housing for a pneumatic system. -Using syringes and balloons to create different types of pneumatic systems - Selecting materials due to their functional and aesthetic characteristics. - Manipulating materials to create different effects.	-Measuring, marking, cutting and assembling with increasing accuracy. -Making a model based on a chosen design.		-Measuring, marking and checking the accuracy of the jelutong and dowel pieces required. -Measuring, marking and cutting components accurately using a ruler and scissors. -Assembling components accurately. -Understanding Selecting appropriate materials.
	Evaluate		Testing the finished product, seeing if it moves as planner or not. If not, identifying why the wheels are not moving.	Evaluating own designs against design criteria. -Using peer feedback to modify a final design.	Using the views of others to improve designs. -Testing and modifying the outcome, suggesting improvements. -Understanding the purpose of exploded-diagrams through the eyes of a designer and their client.	Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.		Evaluating the work of others and receiving feedback on own work. -Applying points of improvement to their toys. -Describing changes they would make/do if they were to do the project again.

	Technical knowledge		-To know that a mechanism is the parts of an object that move together. -To know that a slider mechanism moves an object from side to side. - To know that a slider mechanism has a slider, slots, guides and an object. -To know that bridges and guides are bits of card that purposefully restrict the movement of the slider.	-To know that mechanisms are a collection of moving parts that work together as a machine to produce movement. - To know that there is always an input and output in a mechanism. -To know that an input is the energy that is used to start something working. -To know that an output is the movement that happens as a result of the input. -To know that a lever is something that turns on a pivot. -To know that a linkage mechanism is made up of a series of levers	-To understand how pneumatic systems work. -To understand that pneumatic systems can be used as part of a mechanism. -To know that pneumatic systems operate by drawing in, releasing and compressing air.	-To understand that all moving things have kinetic energy. -To understand that kinetic energy is the energy that something (object/person) has by being in motion. - To know that air resistance is the level of drag on an object as it is forced through the air. -To understand that the shape of a moving object will affect how it moves due to air resistance.		-To understand that the mechanism in an automata uses a system of cams, axles and followers. -To understand that different shaped cams produce different outputs
Electrical systems /KS2	Design				- Carry out research based on a given topic to develop a range of initial ideas.	- Designing a torch, giving consideration to the target audience and creating both design and	- Identifying factors that could be changed on existing products and explaining how these would alter the form	Designing a steady hand game - identifying and naming the components required.

					-Generate a final design for the electric poster with consideration to the client's needs and design criteria. -Design an electric poster that fits the requirements of a given brief. -Plan the positioning of the bulb (circuit component) and its purpose.	success criteria focusing on features of individual design ideas.	and function of the product. - Developing design criteria based on findings from investigating existing products. - Developing design criteria that clarifies the target user.	- Drawing a design from three different perspectives. - Generating ideas through sketching and discussion. - Modelling ideas through prototypes.
	Make				-Create a final design for the electric poster. -Mount the poster onto corrugated card to improve its strength and allow it to withstand the weight of the circuit on the rear. -Measure and mark materials out using a template or ruler. -Fit an electrical component (bulb). -Learn ways to give the final product a higher quality finish (e.g. framing to conceal a roughly cut edge).	-Making a torch with a working electrical circuit and switch. - Using appropriate equipment to cut and attach materials. - Assembling a torch according to the design and success criteria.	-Altering a product's form and function by tinkering with its configuration. - Making a functional series circuit, incorporating a motor. - Constructing a product with consideration for the design criteria.	-Constructing a stable base for a game. - Accurately cutting, folding and assembling a net. - Decorating the base of the game to a high quality finish. - Making and testing a circuit. - Incorporating a circuit into a base

	Evaluate				-Learning to give and accept constructive criticism on own work and the work of others. -Testing the success of initial ideas against the design criteria and justifying opinions. -Revisiting the requirements of the client to review developing design ideas and check that they fulfil their needs.	-Evaluating electrical products. -Testing and evaluating the success of a final product	-Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses. - Determining which parts of a product affect its function and which parts affect its form. -Analysing whether changes in configuration positively or negatively affect an existing product.	-Testing own and others finished games, identifying what went well and making suggestions for improvement.
	Technical knowledge				-To understand that an electrical system is a group of parts (components) that work together to transport electricity around a circuit. -To understand common features of an electric product (switch, battery or plug, dials, buttons, etc.). -To list examples of common electric products (kettle, remote control etc.). -To understand that an electric product uses an electrical system to work (function). -To know the name and appearance of a bulb, battery,	-To understand that electrical conductors are materials which electricity can pass through. -To understand that electrical insulators are materials which electricity cannot pass through. - To know that a battery contains stored electricity that can be used to power products. -To know that an electrical circuit must be complete for electricity to flow. - To know that a switch can be used to complete and break an electrical circuit.	-To know that series circuits only have one direction for the electricity to flow. -To know when there is a break in a series circuit, all components turn off. -To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin. -To know a motorised product is one which uses a motor to function.	-To know that batteries contain acid, which can be dangerous if they leak. -To know the names of the components in a basic series circuit, including a buzzer.

					battery holder and crocodile wire to build simple circuits.			
Cooking and nutrition	Design	-Designing a soup recipe as a class. Designing soup packaging.	-Designing smoothie carton packaging by-hand or on ICT software.	-Designing a healthy wrap based on a food combination which works well together.	-Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.	-Designing a biscuit within a given budget, drawing upon previous taste testing judgements	-Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients. -Writing an amended method for a recipe to incorporate the relevant changes to ingredients.	-Writing a recipe, explaining the key steps, method and ingredients. - Including facts and drawings from research undertaken.
	Make	-Chopping plasticine safely. Chopping vegetables with support.	Chopping fruit and vegetables safely to make a smoothie. - Identifying if a food is a fruit or a vegetable. - Learning where and how fruits and vegetables grow.	Slicing food safely using the bridge or claw grip. - Constructing a wrap that meets a design brief.	-Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination. - Following the instructions within a recipe.	-Following a baking recipe, from start to finish, including the preparation of ingredients. - Cooking safely, following basic hygiene rules. - Adapting a recipe to improve it or change it to meet new criteria (e.g. from savoury to sweet).	-Cutting and preparing vegetables safely. -Using equipment safely, including knives, hot pans and hobs. -Knowing how to avoid cross-contamination. -Following a step by step method carefully to make a recipe.	-Following a recipe, including using the correct quantities of each ingredient. - Adapting a recipe based on research. - Working to a given timescale. - Working safely and hygienically with independence.

	Evaluate	-Tasting the soup and giving opinions. Describing some of the following when tasting food: look, feel, smell and taste. Choosing their favourite packaging design and explaining why.	-Tasting and evaluating different food combinations. - Describing appearance, smell and taste. - Suggesting information to be included on packaging	-Describing the taste, texture and smell of fruit and vegetables. - Taste testing food combinations and final products. - Describing the information that should be included on a label. - Evaluating which grip was most effective.	-Establishing and using design criteria to help test and review dishes. -Describing the benefits of seasonal fruits and vegetables and the impact on the environment. - Suggesting points for improvement when making a seasonal tart.	-Evaluating a recipe, considering: taste, smell, texture and appearance. - Describing the impact of the budget on the selection of ingredients. - Evaluating and comparing a range of food products. - Suggesting modifications to a recipe (e.g. This biscuit has too many raisins, and it is falling apart, so next time I will use less raisins).	-Identifying the nutritional differences between different products and recipes. -Identifying and describing healthy benefits of food groups.	-Evaluating a recipe, considering: taste, smell, texture and origin of the food group. -Taste testing and scoring final products. -Suggesting and writing up points of improvements when scoring others' dishes, and when evaluating their own throughout the planning, preparation and cooking process. - Evaluating health and safety in production to minimise cross contamination
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	Knowledge -To know that soup is ingredients blended together - To know that vegetables are grown. -To recognise and name some common vegetables. - To know that different vegetables taste different. -To know that eating vegetables is good for us. -To discuss why different packages might be used for different foods.	-Understanding the difference between fruits and vegetables. -To understand that some foods typically known as vegetables are actually fruits -To know that a blender is a machine which mixes ingredients together into a smooth liquid. - To know that a fruit has seeds and a vegetable does not. -To know that fruits grow on trees or vines. - To know that vegetables can grow either above or below ground. -To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber).	- To know that 'diet' means the food and drink that a person or animal usually eats. -To understand what makes a balanced diet. -To know where to find the nutritional information on packaging. -To know the five main food groups - To understand that I should eat a range of different foods from each food group, and roughly how much of each food group. -To know that nutrients are substances in food that all living things need to make energy, grow and develop. -To know that 'ingredients' means the items in a mixture or recipe. -To know that I should only have a maximum of five teaspoons of sugar a day to stay healthy. - To know that many food and drinks we do not expect to contain sugar do; we	-To know that not all fruits and vegetables can be grown in the UK. -To know that climate affects food growth. -To know that vegetables and fruit grow in certain seasons. - To know that cooking instructions are known as a 'recipe'. -To know that imported food is food which has been brought into the country. -To know that exported food is food which has been sent to another country.. - To understand that imported foods travel from far away and this can negatively impact the environment. -To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre. -To understand that vitamins, minerals and fibre are important for	-To know that the amount of an ingredient in a recipe is known as the 'quantity.' - To know that it is important to use oven gloves when removing hot food from an oven. - To know the following cooking techniques: sieving, creaming, rubbing method, cooling. -To understand the importance of budgeting while planning ingredients for biscuits.	-To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues. - To know that I can adapt a recipe to make it healthier by substituting ingredients. -To know that I can use a nutritional calculator to see how healthy a food option is. -To understand that 'cross-contamination' means bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects.	-To know that 'flavour' is how a food or drink tastes. - To know that many countries have 'national dishes' which are recipes associated with that country. -To know that 'processed food' means food that has been put through multiple changes in a factory. -To understand that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides. - To understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork).
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				call these 'hidden sugars'.	energy, growth and maintaining health. - To know safety rules for using, storing and cleaning a knife safely. - To know that similar coloured fruits and vegetables often have similar nutritional benefits.			
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Textiles	Design	-Discussing what a good design needs. -Designing a simple pattern with paper. - Designing a bookmark. - Choosing from available materials.	-Using a template to create a design for a puppet.	-Designing a pouch.	-Designing and making a template from an existing cushion and applying individual design criteria.	-Writing design criteria for a product, articulating decisions made. - Designing a personalised book sleeve.	-Designing a stuffed toy, considering the main component shapes required and creating an appropriate template. -Considering the proportions of individual components.	N/A: The Condensed Long-term plan does not include a Textiles unit for Year 6
	Make	-Developing fine motor/cutting skills with scissors. -Exploring fine motor/threading and weaving (under, over technique) with a variety of materials. - Using a prepared needle and wool to practise threading.	-Cutting fabric neatly with scissors. - Using joining methods to decorate a puppet. -- - Sequencing steps for construction	-Selecting and cutting fabrics for sewing. - Decorating a pouch using fabric glue or running stitch. - Threading a needle. - Sewing running stitch, with evenly spaced, neat, even stitches to join fabric. - Neatly pinning and cutting fabric using a template.	-Following design criteria to create a cushion or Egyptian collar. - Selecting and cutting fabrics with ease using fabric scissors. - Threading needles with greater independence. - Tying knots with greater independence. - Sewing cross stitch to join fabric. - Decorating fabric using appliqué. - Completing design ideas with stuffing and sewing the edges (Cushions) or embellishing the collars based on design ideas (Egyptian collars).	-Making and testing a paper template with accuracy and in keeping with the design criteria. - Measuring, marking and cutting fabric using a paper template. -Selecting a stitch style to join fabric, working neatly by sewing small, straight stitches. - Incorporating fastening to a design.	-Creating a 3D stuffed toy from a 2D design. -Measuring, marking and cutting fabric accurately and independently. -Creating strong and secure blanket stitches when joining fabric. -Threading needles independently. -Using appliqué to attach pieces of fabric decoration. -Sewing blanket stitch to join fabric. -Applying blanket stitch so the spaces between the stitches are even and regular.	

	Evaluate	-Reflecting on a finished product and comparing to their design.	-Reflecting on a finished product, explaining likes and dislikes.	-Troubleshooting scenarios posed by teacher. -Evaluating the quality of the stitching on others' work. -Discussing as a class, the success of their stitching against the success criteria. -Identifying aspects of their peers' work that they particularly like and why	-Evaluating an end product and thinking of other ways in which to create similar items.	-Testing and evaluating an end product against the original design criteria. -Deciding how many of the criteria should be met for the product to be considered successful. - Suggesting modifications for improvement. -Articulating the advantages and disadvantages of different fastening types	-Testing and evaluating an end product and giving point for further improvements.	
	Technical Knowledge	To know that a design is a way of planning our idea before we start. - To know that threading is putting one material through an object.	To know that 'joining technique' means connecting two pieces of material together. -To know that there are various temporary methods of joining fabric by using staples, glue or pins. -To understand that different techniques for joining materials can be used for different purposes. -To understand that a template (or fabric pattern) is	To know that sewing is a method of joining fabric. - To know that different stitches can be used when sewing. - To understand the importance of tying a knot after sewing the final stitch. -To know that a thimble can be used to protect my fingers when sewing.	To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. -To know that when two edges of fabric have been joined together it is called a seam. -To know that it is important to leave space on the fabric for the seam. -To understand that some products are turned inside out	To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro. - To know that different fastening types are useful for different purposes. - To know that creating a mock up (prototype) of their design is useful for checking ideas and proportions.	-To know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric. -To understand that it is easier to finish simpler designs to a high standard. -To know that soft toys are often made by creating appendages separately and then attaching them to the main body. -To know that small, neat stitches which are pulled taut are important to ensure that the soft toy is	N/A: The Condensed Long-term plan does not include a Textiles unit for Year 6

			used to cut out the same shape multiple times. -To know that drawing a design idea is useful to see how an idea will look.		after sewing so the stitching is hidden.		strong and holds the stuffing securely	
Digital world (KS2 only)	Design					N/A: The condensed Long term plan does not include a Digital World unit for Year 4	-Researching (books, internet) for a particular (user's) animal's needs. -Developing design criteria based on research. - Generating multiple housing ideas using building bricks. -Placing and manoeuvring 3D objects, using CAD. - Changing the properties of, or combining one or more 3D objects, using CAD.	-Writing a design brief from information submitted by a client. - Developing design criteria to fulfil the client's request. - Developing a product idea through annotated sketches. - Placing and manoeuvring 3D objects, using CAD. - Changing the properties of, or combining one or more 3D objects, using CAD.
	Make						-Understanding the functional and aesthetic properties of plastics. - Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range	-Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo). -Explaining material choices and why they were chosen as part of a product concept.

	Evaluate						-Stating an event or fact from the last 100 years of plastic history. -Explaining how plastic is affecting planet Earth. -Explaining how the product would be useful for an animal carer including programmed features.	-Explaining how my program fits the design criteria -Developing an awareness of sustainable design. -Identifying key industries that utilise 3D CAD modelling and explaining why. - Describing how the product concept fits the client's request. -Explaining how the program fits the design criteria -Explain and demonstrate the tool as part of a product concept pitch.

	Technical knowledge						-To know that a 'device' means equipment created for a certain purpose or job and that monitoring devices observe and record. -To know that a sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose. -To understand that conditional statements in programming are a set of rules which are followed if certain conditions are met.	-To know that accelerometers can detect movement. -To understand that sensors can be useful in products as they mean the product can function without human input.
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