St Joseph’s Catholic Primary School

Progression of Knowledge in DT to Support Sequential and Progressive Planning and Scaffolding and Challenge in Lesson Planning

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others’ needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

 **National Curriculum Purpose of Study 2014**

The national curriculum for DT aims to ensure that all pupils:

* develop the creative, technical and practical expertise needed to perform everyday
* tasks confidently and to participate successfully in an increasingly technological world
* build and apply a repertoire of knowledge, understanding and skills in order to design
* and make high-quality prototypes and products for a wide range of users
* critique, evaluate and test their ideas and products and the work of others
* understand and apply the principles of nutrition and learn how to cook

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|  **Development Matters** | **National Curriculum Programmes of Study Design & Technology**pupils should be taught to:  |
| **Nursery****Personal, social and Emotional development*** Select and use activities and resources, with help when needed. This helps them to achieve a goal they have chosen or one which is suggested to them.

**Physical Development*** Use large-muscle movements to wave flags and streamers, paint and make marks.
* Choose the right resources to carry out their own plan.
* Use one-handed tools and equipment, for example, making snips in paper with scissors.

**Understanding the world*** Explore how things work

**Expressive Arts & Design*** Make imaginative and complex ‘small worlds’ with blocks and construction kits, such as a city with different buildings and a park.
* Explore different materials freely, in order to develop their ideas about how to use them and what to make.
* Develop their own ideas and then decide which materials to use to express them.
* Create closed shapes with continuous lines, and begin to use these shapes to represent objects.
 | KS 1 Pupils should be taught to: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 [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

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

Technical knowledge* 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.

**Cooking and Nutrition**Pupils should be taught to:* Use the basic principles of a healthy and varied diet to prepare dishes,
* Understand where food comes from.
 | KS2Pupils should be taught to: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 [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

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 knowledge* Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
* 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.

**Cooking and Nutrition*** Pupils should be taught to:
* 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.
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| **Reception****Physical development*** Progress towards a more fluent style of moving, with developing control and grace.
* Develop their small motor skills so that they can use a range of tools competently, safely and confidently.
* Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor

**Expressive arts*** Explore, use and refine a variety of artistic effects to express their ideas and feelings.
* Return to and build on their previous learning, refining ideas and developing their ability to represent them.
* Create collaboratively, sharing ideas, resources and skills.
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| **ELG****Physical Development- Fine Motor Skills*** Use a range of small tools, including scissors, paintbrushes and cutlery.

**Expressive Arts & Design- Creating with Materials*** Share their creations, explaining the process they have used.
* Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.
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| Progression of Disciplinary Knowledge in DTShaded areas indicate when the knowledge will be applied through Computing lessons. |
|  | Nursery | Reception | Year 1 | Year 2  | Year 3  | Year 4 | Year 5 | Year 6  |
|  | Pupils know how to: |
| Design | Develop their own ideas and then decide which materials to use to express them. | Create collaboratively, sharing ideas, resources and skills  | Generate ideas using their knowledge of existing products. Design products that have a purpose and are aimed at an intended user.  Understand and follow simple design criteria. | Explain how their products will look and work through talking and simple annotated drawings. Use materials and components considering their function and aesthetics.Use information technology to communicate their ideas e.g Computer software to help explain an idea | Explore different initial ideas before coming up with a final design.Use annotated sketches and cross -sectional drawings to show particular parts of their products work.Develop and follow simple design criteria.Use CAD to develop an understanding of 3D nets | Generate ideas using their knowledge existing products.Plan and test ideas using templates and mock ups.Use annotated sketches and simple exploded diagrams to explain how particular parts of their products workPlace the main stages of making in a systematic order | Generate a range of design ideas and clearly communicate final designs Use exploded diagrams to show how parts will fit together.Test ideas out through using prototypes.Design products that have a clear purpose and indicate the design features of their products that will appeal to the intended user.  | Develop design criteria to inform the design of innovative, functional and appealing products that are fit for purpose and aimed at a specific user.Identify the design features of their products that will appeal to intended customers.Use CAD to develop and communicate ideas Use annotated sketches, cross-sectional drawings and exploded diagrams to communicate their ideas |
| Make | Use one-handed tools and equipment, for example, making snips in paper with scissors. | Use a range of small tools, including scissors, paintbrushes and cutlery. | Measure and mark out with supportCut and shape materials with some accuracyUse hand tools and kitchen equipment safely and appropriately and how to follow hygiene proceduresCut and peel ingredients | Cut, shape and join fabric to make a simple productUse a basic running stitch to join materialsUse a range of materials and components according to their functional properties including textiles and food ingredientsAssemble, join and combine materials, components or ingredients.Use simple finishing techniques to improve the appearance of their product, such as addingsimple decorations.Measure and weigh ingredients using measuring cups | Use a range of tools and equipment safely, appropriately and accurately and know basic hygiene proceduresUse a wider range of materials and components, including construction materials and kits, textiles and mechanical and electrical components.Assemble, join and combine material and components with some degree of accuracy.Measure ingredients using measuring jugs | Select from a range of tools and equipment, explaining their choices.Select from a range of materials and components according to their functional properties and aesthetic qualitiesCut and shape materials with some degree of accuracyMeasure, make a seam allowance, pin, cut, shape and join fabric with precision to make a more complex product.Measure and weigh ingredients using scalesFollow a recipe with adult support | Measure and mark out to the nearest cm and millimetreSelect from a wide range of tools and equipment including those to cut woodexplaining their choices.Select from a range of materials and components according to their functional properties and aesthetic qualitiesCut, shape, score and assemble materials with precision and accuracyMeasure and weigh ingredients to the nearest gram and millilitreFollow a recipe | Independently plan by suggesting what to do nextCreate step-by-step plans as a guide to makingUse a range of tools and equipment safely and appropriately and know hygiene procedures including storing foodUse a broad range of materials and components, including construction materials, textiles, and mechanical componentsJoin textiles using a greater variety of stitches, such as whip stitch and blanket stitchRefine the finish using techniques to improve the appearance of their product, such as sandingAdapt a recipe to change the taste |
| Evaluate | Share their creations | Share their creations, explaining the process they have used | Explore and evaluate existing products mainly through discussionsExplain positives and things to improve for existing productsTalk about their design ideas and what they are making.Start to identify strengths and possible changes they might make to refine their existing design | Explore and evaluate existing products through discussions, comparisons and simple written evaluationsExplore what materials/ingredients products are made fromEvaluate their products and ideas against their simple design criteria | Explore and evaluate existing products, explaining the purpose of the product and whether it is designed well to meet the intended purposeExplore what materials/ingredients products are made from and suggest reasons for thisEvaluate their product against their original design criteria | Evaluate their ideas and products against the original design criteria, making suggestions for improvements | Evaluate how developments, in design helped shape the world e.g how pulleys are used in wells and gym equipment & how linkages are used in cherry pickers and umbrellasEvaluate their ideas and products against the original design criteria making changes as necessary | Consider their design criteria as they make progress and are willing to alter their plans/ recipes sometimes considering the views of others if this helps them to improve their product |
| **Computing**Evaluate some key events, including technological developments, and designs of individuals in design and technology that have helped shape the world e.g WWW, wifi and Bluetooth. |
| Technical knowledge | Make imaginative and complex ‘small worlds’ with blocks and construction kits, such as a city with different buildings and a park. | Return to and build on their previous learning, refining ideas and developing their ability to represent them. | Build simple structures, exploring how they can be made stronger, stiffer and more stableCreate products using mechanisms, such as levers and sliders | Use simple electrical circuits with support to create functional products e.g a lighthouse with a bulb | Select materials considering the functional properties and aesthetic qualitiesApply their understanding of how to strengthen, stiffen and reinforce more complex structures.Use mechanical and electrical systems to power a vehicle | Use mechanical systems such as levers to create movementin their products. | Apply their understanding of how to strengthen, stiffen and reinforce more complex structures in order to create more useful characteristics of productsUse mechanical systems, such as pulleys, linkages and hinges, to create movement in their products | Use mechanical systems, such as cams, to create movement in their products |
| **Computing**Apply their understanding of computing to program, monitor and control a product. |
| Progression of substantive knowledge in DT |
|  | Nursery | Reception | Year 1 | Year 2  | Year 3  | Year 4 | Year 5 | Year 6  |
| Pupils know how to: |
| Design skills | Box modelling | Box modelling | Use simple labelled plans | Use simple cross sectional drawings and can follow simple design criteria | Use annotated sketches, simple CAD to produce nets and can follow design criteria. | Use simple paper templates to communicate ideas | Use exploded diagrams and prototypes to communicate ideas as well as develop design criteria with an end user in ming | Use a range fo design processes to communicate ideas- selecting the appropriateness for the audience. |
| Cutting, joining and finishing | Use simple tools with adult support eg scissors and glue spreader | Use simple tools eg scissors and glue spreaders. | Use materials to join e.g glue sticks and sellotape | Use tools to join fabrics eg needles and safety pins | Select and use a range of tools eg hole puncher, stapler and ruler | Use tools to join fabrics eg small eye needles and pins | Use a wider range of tools to cut, join and finish eg hot glue gun and sandpaper | Use a wide range of tools to cut, join and finish e.g saw, Stanley knife, cutting mat, metal ruler and screw driver. |
| Materials | Use simple materials e,g junk modelling materials and card | Use simple materials e.g junk Modelling ,fabric and split pins | Use materials to build structures and mechanical products e.g paper, card, lolly sticks and split pins | Use a range of materials eg junk modelling materials, card/felt/thread/wool/ electrical components- bulb, wires and battery | Use electrical components to build kits e.g motor, wires, battery and switch | Use junk modelling materials and fabrics | Use a range of tools and materials to construct products and structures e.g wood, electrical components- LED lights | Use a greater range of materials to join and finish products e.g screws, dowling and wadding |
| Mechanisms | Use split pins to create a simple pivot action. | Use split pins to create a simple pivot action. | Use pivots, sliders and levers to create movement in books |  | Wheels are attached to axles and both are attached to a chassis in vehicles | Use levers to transfer force | Use pulleys and linkages to transfer force.Use pop up mechanisms to create movement in books | Use cams to transfer force |
| Circuits |  |  |  | Create a simple circuit with bulb | Create a circuit with a motor and switch |  | Create a circuit with a bulb and switchUse copper tape in place of wires |  |
| Computing |  |  | Use software to communicate ideas |  | Use CAD to create simple 3D nets |  |  | **Computing**Use an interface to control physical systems |
| Progression of substantive knowledge in Cooking |
|  | Nursery | Reception | Year 1 | Year 2  | Year 3  | Year 4 | Year 5 | Year 6  |
|  |
| Pupils know how to: |
| Diet | Know how to make healthy food and drink choices | Know how to make healthy food and drink choices | Know we should eat a range of different foods | Know that food and drink provide energy for the body | Know that foods high in sugar should be limited | Know the importance of portion size | Know that food and drinks provide different nutrients | Know that different cooking methods can provide healthier dishes  |
| Origin of food | Know how to plant seeds to grow fruit and vegetables | Know how to plant seeds to grow fruit and vegetables | Know how a range of fruit and vegetables grow | Know where a range of foods come from | Know what seasonality is  | Know some foods which are reared and processed | Know some foods which are caught and processed. | Know where and how a variety of ingredients are grown, reared, caught and processed. |
| Food Preparation | Know how to perform simple preparation skills with adult support e.g mixing, pouring and weighing | Know how to perform simple preparation skills with adult support e.g mixing, pouring, weighing and cutting | Know simple preparation skills eg chopping, spreading, cutting and mixing. | Know simple preparation skills eg mixing, kneading and rolling and can weigh ingredients with adult support | Know a range of preparation skills eg peeling and crushing and selects suitable chopping techniques eg pincer and bridge hold. and starts to use | Know a range of preparation skills and starts to weigh ingredients independently | Know an extended range of preparation skills e.g slicing and dicing, basting and kneading.Starts to use a wider range of tools eg garlic press and electric mixer | Know an extended range of preparation skills e.g julienning, creaming, flaking, boiling. Uses a wider range of tools eg electric blender. |
| Cooking skills | Know simple cooking skills to prepare cold dishes as well as simple boiling of soup with adult support | Know simple cooking skills to prepare cold dishes as well as baking with adult support | Know simple cooking skills to prepare cold dishes as well as baking with adult support | Know simple cooking skills e.g baking | Know a range of cooking skills e.g simmering, stewing and toasting | Know a range of cooking skills e.g baking and frying | Know an extended range of cooking skills e.g grilling and proving | Know an extended range of cooking skills e.g boiling, poaching and reducing |
| Food hygiene | Know basic hygiene when using food e.g spotting rotten food at snack rime | Know basic hygiene when using food eg washing hands | Know basic hygiene when using food eg washing hands, and rolling up sleeves | Know basic hygiene when using food eg washing hands, rolling up sleeves and tying long hair back | Know how to be hygienic and safe when using food e.g disinfecting tables  | Know how to be hygienic and safe when using food e.g disinfecting tables and washing hands after handling raw meat or fish | Know how to prepare ingredients hygienically and understand how to store and handle meat and fish correctly e,g washing up equipment and avoiding touching hair and face | Know how to prepare ingredients hygienically and understand how to store and handle meat and fish correctly e,g washing up equipment, avoiding touching hair and face and how to store foods once cooked |