

Bluecoat Primary Academy Design and Technology Progression Document 2020

**Bluecoat Primary Academy Design and Technology Intent Statement**

Design and Technology is an analytic, imaginative and practical subject. It encourages children to think creatively in order to problem solve as an individual or part of a team. At Bluecoat Primary, we encourage children to use their ingenuity and originality to design and make products as a response to relevant problems within a variety of contexts, considering the needs, wants and values of others. Within a sequence of learning, children are also given opportunities to reflect and evaluate past and present designs, enabling them to become innovators and risk-takers. Wherever possible, we aim to link projects across subjects giving a deeper understanding of entire concepts and a rich purpose for learning.

As society’s needs are always changing, a correct solution today may not be valid tomorrow. Consequently children learn how to take risks, becoming resourceful, creative and curious citizens. Through the skill of evaluation, when analysing past and present technological advances, the children develop a critical understanding of its impact on daily life and the wider world. Design and technology education makes an essential contribution to the creativity, culture and wealth of the world we live in.

**Design and Technology Progression Document Guide**

Subject expectations: individual units within the subject will be explained as set out by the National Curriculum.

Curriculum overview: an overview to show where the design and technology process will be taught in each year group over the academic year.

Themes: An overview of how the themes link into the teaching of design and technology.

Equipment: the supporting resources which are needed in order to support children’s progression will be identified here.

**National Curriculum Expectations**

Each year group will partake in age appropriate learning for the following units: designing, making, evaluating, technical knowledge and cooking. Below is a breakdown of some of the things covered in each unit, however, these are age dependent to ensure a progression of skills from Nursery to Year 6.

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 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
• understand and use electrical systems in their products
• apply their understanding of computing to program, monitor and control their products

Cooking and nutrition:

• 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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| **Nursery** |
| **Summary of key learning:**Throughout the Foundation Stages children are introduced to the basics of DT and the realisation that ideas in their minds can be physically represented is leap for them developmentally. |
| **Themes where links to DT can be exploited:**Mainly explored throughout the children’s free flow periods of uninterrupted play and especially within the construction areas of the classroom as well as specific child led activities bringing their ideas to life with junk modelling. |
| **Design** | **Make** | **Evaluate** | **Technical knowledge** | **Cooking & nutrition** |
| * Verbalise what they are going to make in broken simple sentences. (E.g. I make car.)
* Explore how things work by using them in free flow. (E.g. knowing cars move with wheels).
 | * Uses various construction materials – big and small world (duplo, wooden blocks, sticky bricks).
* Beginning to construct, stacking blocks vertically and horizontally, making enclosures and creating spaces.
* Realises tools can be used for a purpose (scissors can cut, glue will stick, pencils draw).
* Choose and explore everyday materials in the appropriate areas of the classrooms.
* Express original ideas.
 | * Use their creations in context (e.g. if made a kite, go and use the kite).
 | * Explore building towers and show awareness of stability (e.g. holding it so it doesn’t wobble).
 | * Know some basic hygiene.
* Understand they need adult support in the kitchen to stay safe.
* Start to have an awareness of healthy foods.
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| **Equipment:**Scissors and glue sticks. |

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| **Early Years F2** |
| **Summary of key learning:**Throughout the Foundation Stages children are introduced to the basics of DT and the realisation that ideas in their minds can be physically represented is leap for them developmentally. |
| **Themes where links to DT can be exploited:**Mainly explored throughout the children’s free flow periods of uninterrupted play and especially within the construction areas of the classroom as well as specific child led activities bringing their ideas to life with junk modelling. |
| **Design** | **Make** | **Evaluate** | **Technical knowledge** | **Cooking & nutrition** |
| * Verbalise what they are going to make (E.g. I am going to make a car.)
* Exploring and verbalising how things work (E.g. Cars need wheels to move).
* Explaining mark making of what they are going to make in full sentences to an adult.
 | * Constructs with a purpose in mind – starting to think about the design they want to create.
* Use a range of construction materials (E.g. wooden bricks, popoids, magnetic polydron, interstars, polydron, mobilo)
* Uses simple tools and techniques competently and appropriately (e.g. cutting more fluently).
* Selects appropriate resources and adapts work where necessary (E.g. if glue isn’t strong enough, what can you use).
* Selects tools and techniques needed to shape, assemble and join materials they are using (E.g. scissors, PVA glue, pritt stick).
 | * Verbalise how they made their creation.
* Verbalise what they like and don’t like about their creation. (E.g. I like the colour. I don’t like the shape).
* Start to verbalise ways they would change their model if they made it again (E.g. I wasn’t to change…)
 | * Explore building towers knowing why they fall down and how they can prevent that from happening.
 | * Understand why we wash our hands before we cook.
* Know when to ask for adult support and use some simple utensils independently (able to use knife and fork).
* Start to learn about the difference between healthy and unhealthy foods.
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| **Equipment:**Scissors, PVA glue, glue stick, sellotape and masking tape. |

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| **Year 1** |
| **Summary of key learning:**This is the first year which children are introduced to the formal recording of the design and evaluation stages of the process. It is important that children have an understanding of why the process is documented in the real world. |
| **Themes where links to DT can be exploited:**Nottingham now and then: Goose Fair:* Making candyfloss/ candy apples
* Discover all the foods at Goose fair – plant based and animal based and discuss how these are made/ where they come from.

London: The Great Fire of London:* Building structures could be achieved by researching different styles of bridge and creating London Bridge using a variety of techniques they have seen - working out which technique allows the bridge to hold the most weight.
* Sliders used in a moving picture to show the fire spreading throughout London.

Grace Darling**:*** Design an outfit which would have benefitted Grace Darling when rescuing survivors of the shipwreck, justifying why they have chosen the materials (linking to everyday materials in science).
 |
| **Design** | **Make** | **Evaluate** | **Technical knowledge** | **Cooking & nutrition** |
| * Generate ideas and recognise familiar products
* Use pictures and words to describe their designs.
 | * Select from a range of tools and equipment to perform practical tasks (e.g. scissors, glues)
* Choose materials and explain why.
 | * Evaluate your own products using simple sentences.
 | * Build structures, exploring how they can be made stronger, stiffer and more stable.
* Use mechanical - focus on levers and sliders.
 | * Start to understand where food comes from.
* Make simple dishes safely & hygienically.
* Begin to learn about healthy & varied diets.
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| **Equipment:**Scissors, PVA glue, glue stick, sellotape and masking tape. |

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| **Year 2** |
| **Summary of key learning:**In Year 2, children are introduced to the textiles branch of DT for the first time and the skills which accompany this. Creating products in response to a criteria is also expected at this stage - knowing products are made for a reason and evaluated against it. |
| **Themes where links to DT can be exploited:**Hero or Villain? Robin Hood:* Make a wagon for Robin Hood to carry around his stolen treasures (using hot glue gun to join wooden dowels).
* Create a moving dragon with levers and linkages.

Explorers. Arctic:* Design clothes suitable for Arctic conditions, justifying why they have chosen the materials.
* Explore flags from around the world and create a moving picture, with levers and linkages, to make them fly in the wind.

 Savana**:*** Create felt puppets (sown together with a simple running stitch) of the different animals in Handa’s surprise to retell the story with.
* Discover the fruits from around the world that are imported into this country and how different fruits/vegetables are grown.
* Make a picnic where children make their own sandwiches spreading the filling and cutting into quarters.
* Bake animal biscuits.
 |
| **Design** | **Make** | **Evaluate** | **Technical knowledge** | **Cooking & nutrition** |
| * Design purposeful & functional products for themselves & others based on a criteria.
* Generate, develop, model & communicate ideas through talking, drawing and templates.
 | * Select from & use a wide range of materials & components including textiles, ingredients & construction materials.
* (e.g. hot glue guns, stitching and hinges.)
* Choose materials & explain why they are being used.
* Join materials together as part of a moving structure.
 | * Research & evaluate existing products to inform designs.
* Evaluate their ideas and products against design criteria.
 | * Use mechanical - focus on wheels and axles.
 | * Deepen understanding of farming & importing.
* Name & sort foods into food groups.
* Learn preparation techniques (focus on cutting, spreading and mixing).
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| **Equipment:**Hot glue guns, needles, axels, wheels, wooden dowels and scissors. |

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| **Year 3** |
| **Summary of key learning:**In Year 3, the extra dimension is introduced as the children have to produce a plan/ flow chart which explains the specific steps of how they will make their product. |
| **Themes where links to DT can be exploited:**Civilisation - Egyptians:* Baking authentic Egyptian bread.
* Make an Egyptian shaduf (a lever and linkage system used to get water out of rivers from the dry land above). Children may need to use saws in order to cut the dowel rods down to size and sand them to prevent splinters.

Empire – Romans:* Make a lever based catapult as a replica of those used in Roman weaponry.
* Create a Roman banquet where the children prepare the food by slicing cheese, chopping vegetable and fruit.

The Greatest Show – Magic/Circus**:*** Magic moving puppets using cams to make the characters move up and down.
* Construct a Ferris wheel using cams as the turning mechanism.
 |
| **Design** | **Make** | **Evaluate** | **Technical knowledge** | **Cooking & nutrition** |
| * Demonstrate that their design meets a range of requirements.
* Complete a plan that shows the order & equipment/ tools needed to make product.
 | * Select from a wider range of tools & equipment to perform practical tasks accurately (e.g. saws, sanding, craft knives)
 | * Investigate & analyse a range of existing products.
* Evaluate their ideas and products against design criteria (has it met the criteria or not and why).
 | * Strengthen frames using simple methods.
* Use mechanical - focus on cams, levers & linkages.
 | * Understand that seasons affect food availability.
* Prepare & cook a variety of mainly savoury dishes safely & hygienically
* Develop a range of techniques - focus on chopping, slicing, kneading and baking.
 |
| **Equipment:**Hot glue guns, wooden dowels, safety goggles, saws, clamps, sanding paper, craft knives and kitchen knives. |

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| **Year 4** |
| **Summary of key learning:**This is the first year where electrical components are incorporated when making products. Also, the degree of explanation and justification within the evaluation stage of the DT process significantly increases. |
| **Themes where links to DT can be exploited:**What a Wonderful World! Rainforests:* Create a trap for the poachers in the Rainforest using a pulley system in order to reset it (using saws to cut down the dowel rods to create their traps).
* Use gears to make a wind up rainforest wonder.

What the Dickens? Victorians:* Distressed message from the owner of Newstead Abbey that they have been burgled. Children to create a pressure alarm with the new idea of electricity (linking to electricity unit in science).
* Zoetrope made using gears as the mechanical system which makes it spin.
* Bake cheese scones.

Vicious Vikings:* Anglo Saxon money pouch introducing the children to a variety of stitch types.
* Make Traditional Viking mushroom soup.
* Knowing that food and drink provide the body energy can be explored when replicating the digestive system (linking to animals, including humans in science).
 |
| **Design** | **Make** | **Evaluate** | **Technical knowledge** | **Cooking & nutrition** |
| * Demonstrate that their design meets a range of requirements.
* Complete a plan that shows the order & equipment/ tools needed to make product.
* Explain how the selected materials & components are appropriate quality.
 | * Explain how the materials & components chosen have contributed to the aesthetics of the finished product.
* Select from a wider range of tools & equipment to perform practical tasks accurately (e.g. saws, sanding, craft knives)
* Join & combine materials & components accurately (e.g. hot glue guns, wood glue, super glue, different stitching etc.)
 | * Investigate & analyse similar products to the one to be made for the criteria.
* Consider how the finished product might be improved & how well it meets the needs of the user based on the criteria given.
 | * Use a simple circuit in their product.
* Use mechanical systems in their product (focus on gears, and pulleys)
 | * Prepare & cook a variety of mainly savoury dishes safely & hygienically
* Understand that recipes can be adapted.
* Know that food & drink provide energy the body needs.
 |
| **Equipment:**Hot glue guns, wooden dowels, safety goggles, saws, clamps, sanding paper, craft knives, needles, wires, bulb, batteries, buzzers and kitchen knives. |

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| **Year 5** |
| **Summary of key learning:**The main additions in this year are the different viewpoints which their designs need to be drawn in (exploded and cross sectional) and including the views of others/peers when evaluating their products. |
| **Themes where links to DT can be exploited:**WW1/Black History:* Design and make Anderson shelters looking at the ability to reinforce a curved structure.
* Respond to a call for help! Morse code machine has broken and they need to send precious information to the troops (uses switch and buzzer). Or can you make an inclusive air raid siren which both emits noise and a visual queue (uses switch, buzzer and light).
* Make corn bread and gravy.
* Textiles explored by making freedom quilt as a collective.

Explorers – Space and Sea:* Moon buggies where an electrical circuit with a motor is used to turn axel and move the buggy forwards.

Stone Age to Iron Age**:*** Build a Stone Age roundhouse which is strong enough to withstand attack.
 |
| **Design** | **Make** | **Evaluate** | **Technical knowledge** | **Cooking & nutrition** |
| * Use research & develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.
* Create prototypes to show ideas (this can be done with junk modelling).
* Draw designs in cross sectional and exploded views.
 | * Use a tools & materials precisely.
* Select from and use a wider range of materials & components, including construction materials, textiles and ingredients, according to their functional properties & aesthetic qualities.
 | * Evaluate their ideas and products against the design criteria & consider the views of others to improve their work.
 | * Apply understanding of how to strengthen, stiffen and reinforce more complex structures.
* Understand & use electrical systems in their products e.g. series circuits incorporating switches, bulbs, buzzers & motors.
 | * Prepare & cook a variety of mainly savoury dishes safely & hygienically
* Use a range of ingredients in food practises.
* Know about appropriate portion sizes.
* Understand basic processes from farm to table.
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| **Equipment:**Hot glue guns, wooden dowels, axels, wheels, safety goggles, saws, clamps, sanding paper, craft knives, needles, wires, motor, batteries, buzzers and kitchen knives. |

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| **Year 6** |
| **Summary of key learning:**In Year 6, computer involvement throughout the different stages of production is explored. Children will be expected to use computer programs to design their products and write algorithms to control the output of their creation. |
| **Themes where links to DT can be exploited:**The Hobbit:* Recreate Bilbo’s orange marmalade on toast for second breakfast.
* Use WeDo Lego to build Smaug and write computer program to control his movements.

WW2:* Design and make wartime aircraft using electrical skills to run propellers.
* Bake a traditional eggless cake.

Natural disasters**:*** Make state of the art flood defences (thinking about materials, structure, sizing).

Transition:* Make pizzas for a pizza party at the end of the year.
* Linking with the secondary for transition designing keyring for their new school bags on computers and using CAM engraving machine or 3D printer.
 |
| **Design** | **Make** | **Evaluate** | **Technical knowledge** | **Cooking & nutrition** |
| * Use market research to inform plans.
* Generate, develop, model & communicate their ideas through discussion, annotated sketches, cross-sectional & exploded diagrams, prototypes & computer aided designs (SketchUp).
 | * Make modifications to the original design as they proceed.
* Cut & join with accuracy to ensure a high quality finish to the product.
* Select from and use a wider range of materials & components, including construction materials, textiles and ingredients, according to their functional properties & aesthetic qualities.
 | * Evaluate their ideas and products against the design criteria & consider the views of others to improve their work.
* Understand how key events & individuals in design & technology have helped shape the world.
 | * Apply understanding of how to strengthen, stiffen and reinforce more complex structures.
* Understand & use electrical systems in their products e.g. series circuits incorporating switches, bulbs, buzzers & motors.
* Apply understanding of computing to program, monitor & control product.
 | * Prepare & cook a variety of mainly savoury dishes safely & hygienically
* Use information on food labels to inform decisions.
* Know there are different nutrients in foods important for health.
 |
| **Equipment:**Hot glue guns, wooden dowels, axels, wheels, safety goggles, saws, clamps, sanding paper, craft knives, wires, motor, batteries, WeDo, Sketch Up, 3D printers, engravers and kitchen knives. |