Design and Technology Programme of Study

Design and Technology Curriculum – Intent

For children to think like designers. To solve problems, individually and as part of a team, within a set of criteria. To know how to research and evaluate existing products. To be able to create designs for a purpose. To use a range of manufacturing techniques and materials to create products based on these designs and evaluate these products for their effectiveness. To be innovators and risk takers. To develop their ability to use a range of hand tools safely and effectively. To apply mathematical knowledge in a practical context.

Design and Technology in the Early Years

Statements from 2022 Development Matters. The following statements outline age related expectations to match the programme of study for D&T.

3- and 4-year-olds will be learning to:

Personal, Social and Emotional Development	• Select and use activities and resources, with help when needed. This helps to achieve a goal they have chosen, or one of which is suggested to them. Activities include: *Sewing, weaving, folding paper to make animals, light hammers and large head nail tools with soft blocks of wood.*
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, for example choosing a spade to enlarge a small hole they dug with a trowel. • Use one handed tools and equipment, for example, making snips in paper with scissors. Activities include: *Large mark-making, small and large construction activities, junk modelling*
Understanding the world	• Explore how things work. Activities include: *Mechanical toys and equipment for children to play and investigate with (wind-up toys, pulleys, cogs with pegs and boards)* • Talk about the differences between materials and changes they notice Activities include: *Cooking, melting, freezing*
Expressive Arts and Design	• Make imaginative and complex 'small worlds' with blocks and construction kits. • Explore different materials freely, in order to develop their ideas freely about how to use them and what to make. • Develop their own ideas and then decide which materials to use to express them. • Join different materials and explore different textures. Activities include: *Imaginative play, junk modelling and collaging using glue, making tape, scrap materials, hammers and nails, glue guns, paper clips and fasteners.*

Children in Reception will be learning to:

Children in reception continue to develop the skills mentioned above with the addition of:

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.
Expressive Arts and Design	• Explore, use and refine a variety of artistic effects to express, their ideas and feelings. • Return and build on their previous learning, refining ideas, and developing their ability to represent them. • Create collaboratively, sharing ideas, resources and skills.

Early Learning Goals (at the end of Reception):

Physical Development: **Fine Motor Skills**	• Use a range of small tools, including scissors, paintbrushes and cutlery.
Expressive Arts and Design **Creating with Materials**	• 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.

YEAR 1

Unit 1 Food Tech: Ice Cream

End Product – Ice-cream.
Vocabulary – ice-cream, sorbet, dairy, alternative (non-dairy), allergens, fruit, utensil, whisk, knife, chopping board, hygiene, safety, quantity, measure, mix, freeze, flavour

Outcomes

- Measure quantities of food.
- Follow a recipe.
- Safely use a knife to prepare fruit.
- Use basic kitchen utensils e.g. whisk.
- Explore different combinations of flavours.
- learn about dairy alternatives and food allergies.
- understand the importance of food hygiene.

BAME Consider flavours from around the world and any cultural preferences

Tools : whisk, child-friendly knife, bowls, large tupperware, spoons, freezer, chopping boards

Unit 2 Textiles: Weaving Fish

End Product – Woven Fish
Vocabulary – weave, loom, over and under, repeated pattern, sequence, colour, textile, material, fabric, ribbon, texture, safety, scissors, cut,

Outcomes

- Identify and describe textures, colours and patterns in textiles
- Investigate the technique of weaving showing understanding of colour and texture
- Explain how they are making their weaving

- Identify what they would like to develop in future work and why
- Learn how to use tools safely, effectively and efficiently e.g. with scissors
- Follow a pattern
- Experiment with papers and fabrics and create different effects

BAME: Weaving as an ancient and important technique across cultures

Tools: scissors

materials: a variety of colourful ribbon , A3 white card

Unit 3 Construction: Playgrounds (junk modelling)

End Product – A junk-modelled playground
Vocabulary – playground, 3D shapes, join, construct, attach, moving parts, design, purpose, evaluate, swings, slide, roundabout, see-saw.

Outcomes
- Research what makes a successful playground.
- Recognise simple features of playground equipment and how they are used and move.
- Investigate how materials and components have been used in playground
- Use a range of materials and techniques to assemble and join components to make realistic models of playground equipment
- Investigate how to make playground structures more stable eg by using a wide base and able to withstand greater loads eg by adding a support to their swing or climbing frame
- Evaluate own work eg the climbing frame is strong and will not tip over

Tools: scissors

Materials: lollipop sticks, masking tape, pipe cleaners, paper straws

YEAR 2

Unit 4 Food Tech: Fruit Crumble

End Product – A fruit crumble.
Vocabulary – fruit, prepare, chop, peel, slice, knife, handle and blade, chopping board, crumble, topping, flavour, utensil, oven safety, instructions - recipe, food hygiene, bake, cook, texture, spices, sweeten, sugar, ingredients.

- know how to safely handle hot goods.
- Observe and instruct the process of using an oven.
- Risk assess dangers in the kitchen e.g. hot ovens/sharp knives.
- Know about food intolerances and allergies and investigate alternatives.
- Prepare and chop a range of fruits

- Handle tools safely, effectively and efficiently e.g. knives *(any others?)*
- Investigate varied flavours and textures
- Understand the importance of food hygiene

Tools: knives, oven, individual foil containers, mixing bowls, wooden spoons, chopping boards, aprons, weighing scales

Unit 5 Textiles: Binka Book Marks

End Product – A cross stitched book-mark.
Vocabulary – cross-stitch, needle, thread, needle eye, running stitch, pattern, knot, over and under, book mark, embroidery, whip-stitch, back-stitch

- Safely handle a needle.
- Thread a needle.
- Sew a simple running stitch.
- Experience other stitches (cross-stitch, whip-stitch, back-stitch, zig-zag etc).
- Complete a stitch
- Create and follow a design.

Tools: needle, needle threader, binka material

Unit 6 Construction: Wind-up toys

End Product – A wind-up toy based on a story.
Vocabulary – cams, string, wind-up, axel, direction, length, ascend, descend, purpose, design, measure, saw, vice, tool safety, attach, evaluate, push, pull, audience

- Investigate ways to make a toy move (push, pull, wind-up etc).
- Identify a target audience.
- Develop creative ideas for appearance of toy
- Design a wind-up toy using a known story.
- Use tools safety to construct a frame and moving axel. (*what tools)*
- Test and refine toy or prototype
- Evaluate final product.

Tools: dowelling rods, saws, string, sand paper, cellotape

Year 3

Unit 7 Food Tech: Sandwiches and packaging

End Product- A sandwich with packaging
Vocabulary- sandwich, nutrition, germs, healthy choices, packaging, nutritional value, sugar and salt content, filling, wraps, sliced bread, wholemeal, white bread, brown bread, bagel, baguette, pitta, spread, butter, margarine, salad

- Explore and research different types of sandwiches.
- Design a sandwich of their liking, choosing spreads, fillings and type of bread.
- Understand the detrimental effects of excess sugar and salt in a diet.
- Know why food is packaged (protection and nutritional value).
- Design a box to fit the sandwich, which is easy to open.
- Make a sandwich with fillings.
- Know how to observe good food hygiene when preparing food.
- Evaluate the taste, presentation and construction of the sandwich.

Tools: knives, card for packaging

Unit 8 Textiles: Plaiting friendship bracelets

End Product - a friendship bracelet using knotting techniques
Vocabulary- knotting, braid, thread, pattern, sequencing, cotton, nylon, scoobydoos (plastic thread), ply, looms, design, resilience, patience

- Understand the what friendship bracelets stand for (including the history behind them).
- Research styles of knotting, plaiting etc when creating the bracelets.
- Recognise and explore patterns to be able to replicate.
- Know techniques and skills which can be used to create friendship bracelets.
- Develop patience and perseverance whilst learning a new skill.
- Improve fine motor skills by using techniques.
- Evaluate the knotting techniques used and whether it is fit for purpose.

Tools: threads

Unit 9 Construction: Pneumatic monsters (pneumatic)

End Product- A monster with a moving mouth using a pneumatic system (balloon, syringe and tubing)

Vocabulary- balloon, pneumatic system, syringe, tubing, air tight, design, moving parts, push, pull, air pressure, release of air pressure, expand, inflate, deflate, fixing, input, output, hinge

Tools

- Explain how simple pneumatic systems work using appropriate vocabulary
- Construct effective pneumatic systems

- Investigate ways of using my pneumatic system with other materials to control movement
- Work in a group on a design and technology project
- Present the stages of the project in a storyboard
- Work safely and accurately with a range of simple hand tools
- Evaluate my product as a team and suggest improvements

Tools: eggs boxes, tubing, syringes, balloons, decorative materials

Year 4

Unit 10: Food Tech: Pasta
End Product – A pasta meal
Vocabulary – knead, roll out, boil, drain, recipe, flour, colander, rolling pin, mixing bowl, consistency (of dough), al dente

- Explore the history of pasta, including how it is made and the ingredients used.
- Research different types of pasta and sauces, and in what circumstance they are best used.
- Use good hygiene practices when preparing food.
- Read a recipe and measure ingredients.
- Mix, knead and roll pasta.
- To judge how long to cook the pasta and how to test that it is ready.
- To evaluate the taste and presentation of the pasta dish.

Tools: **Mixing Bowl**
Fork or Dough Scraper

Rolling Pin or Pasta Machine, Pasta Cutter or Knife, Flour for Dusting, Tea Towels, Digital Timer, Aprons

Unit 11: Textiles: Making money containers
End product- A fabric money container
Vocabulary – Velcro, product, design, criteria, features, money container, seam, seam allowance, fastenings, hem, sequence, prototype, fabric, pattern, decorative, stitches,.

- know the purpose of a money container and understand the historical background of them.
- Research money containers, specifically understanding their functionality and materials that they are made from.
- Design and justify design elements, explaining how each part works.
- Select from a limited variety of materials, including buttons, fasteners, Velcro, ribbon, lace etc.
- Use different sewing techniques and know when to apply them.
- Evaluate my design, understanding how well it functions as a container and what improvements could be made if the project was repeated

Tools: Fabric Scissors, needles, pins or clips, fabric markers or chalk

Unit 12: Construction: Story Books Levers and linkages

End Product – A story book with moving parts
Vocabulary -, fit for the purpose, fold, adhesive, scoring, joining, temporary fixing, permanent fixing, linkage, lever, pivot, joint, hinge, rotary, linear

- explain why a particular mechanism has been used and the way it works for the intended purpose cut and shape materials and components with some precision
- produce a range of different mechanisms and develop an understanding of how they work
- have knowledge of a range of fonts and graphic techniques, which are suitable for different purposes
- identify the audience and purpose for my book
- illustrate alternative ideas for my book using drawings and models, and make choices between them
- produce an outline plan that identifies the main stages in making my book, and list the tools, materials and processes needed
- evaluate - identify what is and what is not working well in my book and what makes a quality finish

Tools: Split pins

Year 5

Unit 13: Food Technology – Pizza

End Product: A freshly made and cooked Pizza

- **Vocabulary:** Dough, sauce, pizza types (e.g bianco**,** calzone, deep-dish, pizza al taglio, Neopolitan, margherita, marinara), preheat,
    - Explore the nutritional value of pizzas
    - Investigate the range and variety of pizzas available
    - Select toppings from earlier investigations
    - Design a pizza and write a set of detailed instructions for creating designed pizza(include hygiene and safety)
    - Create pizza dough and make base
    - Prepare rest of ingredients
    - Use knife, colander
    - Create, cook, taste and evaluate pizza

Tools: knife, Pizza cutter, colander, baking tray,

Materials: flour, yeast, toppings, salt, oil, tin foil.

Unit 14: Textiles– creating stories (weaving/sewing)
End Product: A textile depiction of a story
Vocabulary: Synthetic fibre, natural fibre, button, sequin, thread, tapestry, bead, lace, warp, weft, embroidery, texture, loom

- Explore the story telling tradition with textiles (inc. Bayeux tapestry)
- Recap and practise sewing techniques previously taught
- Recap and practise weaving techniques previously taught
- Design individual but consistent elements of story
- Sketch design on fabric

- Use weaving and sewing techniques to create story element
- Create story using different elements, evaluate effectiveness of techniques and final product

BAME Look at textile traditions and techniques from different cultures

Tools: needle, needle threader, hand made loom

Materials; cardboard, thread, material (sheet?)

Unit 15: Construction – moving toys (cams)
End Product: A cam driven moving toy
Vocabulary: follower, axle, rotary motion, linear motion, reciprocating motion, cam, bench hook

- Identify the cam within a mechanism and explain how it changes movement
- Create a labelled design drawing
- Produce step by step plans for making a design, including materials and tools needed
- Measure accurately
- Use glue gun and small saw effectively and safely
- Create model, reviewing and problem solving as the work progresses
- Evaluate own and others work

Tools: saw, glue gun (low melt),

Materials Boxes (all the same - ordered), different types of cams, dowel, elastic bands, wheels for followers,

Year 6

Unit 16: Textiles – making slippers
End Product: Pair of hand-made felt slippers
Vocabulary: mock-up, working drawing, pattern template, working properties, seam, seam allowance, , sole, upper, inner, reinforce, tacking, wadding, hem, flow chart

- evaluate slippers considering appearance, function, cost and safety
- identify the different materials that have been used in a slipper and why they have been chosen
- model the design with paper
- Measure and cut with accuracy
- demonstrate a clear idea of who will use the slipper and draw up an appropriate design specification
- work independently and systematically using step-by-step plan eg a flow chart to sequence my work
- join the fabric parts and use decorative techniques to achieve a well-constructed and finished slipper
- evaluate my slippers critically against the design specification

Tools: Needles, fabric scissors, glue gun

Resources: Felt, buttons, beads, sequins , ribbons, cotton thread,

Unit 17: Food Technology – baking a cake
End Product: a baked cake
Vocabulary: Mixing bowl, whisk, oven, cake pan, spatula, beat, cream, design, measuring jug, sift, bake, preheat,

- Discuss known cakes types and make list
- Taste a variety of cakes from the list and evaluate what makes a good cake (e.g texture)
- What would your dream cake be? Create a drawing, write a description and list ingredients,
- Consider purpose/audience and design and label a cake within constraints
- Whisk/mix effectively as required
- Make cake mixture using accurately measured ingredients
- Observe safety when using an oven
- Use cooking techniques to create a cake
- Decorate and fill as required

BAME – Cakes from around the world.

Tools: Electric whisk, sharp knife, scales, bowls, spoons, pallet knife, icing bags, cake tins

Resources: Flour, butter, sugar, eggs, vanilla essence, jam, cream, chocolate chips

Unit 18: Construction – set design
End Product: Aspects of a stage production set
Vocabulary: furniture, props, wings, backstage, house, apron, flats, backdrop, set, fictional world

- Understand and explore different types of stage settings
- Analyse script and establish requirements for set and props
- Plan and design a simple stage set
- Construct a scaled model – diorama
- Work collaboratively to create specific elements for set

Tools: stanley knife, hand drills, clamps, hand saws, cutting board, sand paper, glue gun
Resources: lollipop sticks, dowling rods, cardboard, fabric