Castle Primary's Design and Technology Curriculum

Skills Progression

Year 1/2

1. Design

a. Use their knowledge of existing products and their own experience to help generate their ideas
b. Design products that have a purpose and are aimed at an intended user
c. Explain how their products will look and work through talking and simple annotated drawings
d. Plan and test ideas using templates and mock-ups
e. Understand and follow simple design criteria
f. Work in a range of relevant contexts, for example imaginary, story-based, home, school and the wider environment
g. Use key vocabulary to demonstrate knowledge and understanding in this strand: *design, attractive, material, properties (of materials), mechanism, label, drawing*

2. Make

Planning:

a. With support, follow a simple plan or recipe
b. Begin to select from a range of hand tools and equipment, such as scissors, graters, zesters, safe knives and juicer
c. Select from a range of materials, textiles and components according to their characteristics

Practical skills and techniques:

d. Learn to use simple hand tools and kitchen equipment safely and appropriately and learn to follow hygiene procedures
e. Use a range of materials and components, including textiles and food ingredients
f. With help, measure and mark out
g. Cut, shape and score materials with some accuracy
h. Assemble, join and combine materials, components or ingredients
i. Demonstrate how to cut, shape and join fabric to make a simple product
j. Manipulate fabrics in simple ways to create the desired effect
k. Use a basic running stich
l. Cut, peel and grate ingredients, including measuring and weighing ingredients using measuring cups
m. Begin to use simple finishing techniques to improve the appearance of their product, such as adding simple decorations
n. Use key vocabulary to demonstrate knowledge and understanding in this strand: *recipe, instructions, measure, weigh, centimetres, grams, material, hygiene, safety, chop, grate, peel, fold, crease, score, sew, stitch, dye, print*

3. Evaluate

a. Explore and evaluate existing products through discussions, comparisons and simple written evaluations
b. Explain positives/ things to improve for existing products
c. Explore what materials products are made from;
d. Talk about their design ideas and what they are making
e. As they work, start to identify strengths and possible changes they might make to refine their existing design
f. Evaluate their products and ideas against their simple design criteria
g. Start to understand that the iterative process sometimes involves repeating different stages of the process
h. Use key vocabulary to demonstrate knowledge and understanding in this strand: *successful, improve, change*

4. Technical knowledge

a. Build simple structures, exploring how they can be made stronger, stiffer and more stable
b. Talk about, and start to understand, the simple working characteristics of materials and components
c. Explore and create products using mechanisms, such as levers, sliders and wheels
d. Use key vocabulary to demonstrate knowledge and understanding in this strand: *secure, stable, strong, structure, force, weight, base, function*

5. Cooking & Nutrition

a. Explain where in the world different foods originate from
b. Understand that all food comes from plants or animals
c. Understand that food has to be farmed, grown elsewhere (e.g. at home) or caught
d. Name and sort foods into the five groups in the Eatwell Guide
e. Understand that everyone should eat at least five portions of fruit and vegetables every day and start to explain why in simple terms
f. Use what they know about the Eatwell guide to design and prepare dishes
g. Use key vocabulary to demonstrate knowledge and understanding in this strand: *farm, grow, produce, harvest, process, fruit, vegetables, nutrition, nutrients, health*

Year 3/4

1. Design

a. Identify the design features of their products that will appeal to intended customers
b. Use their knowledge of some existing products to help generate their ideas
c. Design innovative and appealing products when given an intended purpose and a user
d. Follow design criteria and begin to identify some of their own
e. Explain how some parts of their products work
f. Use annotated sketches and cross-sectional drawings to develop and communicate their ideas
g. Use simple computer-aided design
h. When designing, consider some different initial ideas before coming up with a final design
i. When planning, start to explain their choice of materials and components including function and aesthetics
j. Work in a broader range of relevant contexts, for example] entertainment, the home, school, leisure, food industry and the wider environment
k. Use key vocabulary to demonstrate knowledge and understanding in this strand: *aesthetic, appeal, target user, function, material, adhesive, mechanism, component, annotation, cross section*

2. Make

Planning:

a. With growing independence, carefully select from a range of tools and equipment, explaining their choices
b. Begin to select from a materials and components according to their functional properties and aesthetic qualities
c. Place the main stages of making in a systematic order

Practical skills and techniques:

d. Begin to use a range of tools and equipment safely, appropriately and accurately and learn to follow hygiene procedures
e. Use a wider range of materials and components, including construction materials and kits, textiles and mechanical and electrical components
f. With growing independence, measure and mark out to the nearest centimetre and millimetre
g. Cut, shape and score materials with some degree of accuracy
h. Assemble, join and combine materials and components with some degree of accuracy
i. Demonstrate how to measure, cut, shape and join fabric with some accuracy to make a simple product
j. Join pieces of fabric with an appropriate sewing technique
k. Begin to select and use different and appropriate finishing techniques to improve the appearance of a product such as hemming, tie-dye, fabric paints and digital graphics
l. Use key vocabulary to demonstrate knowledge and understanding in this strand: *recipe, instructions, measure, weigh, millimetres, material, safety, chop, grate, peel, fold, crease, score, sew, embellish.*

3. Evaluate

a. Explore and evaluate existing products, explaining the purpose of the product and whether it is designed well to meet the intended purpose
b. Explore what materials/ingredients products are made from and suggest reasons for this
c. Consider the design criteria as they make progress and are willing to alter their plans, sometimes considering the views of others if this helps them to improve their product
d. Evaluate their product against the original design criteria
e. Understand that some key events in design and technological have helped shape the world
f. Use key vocabulary to demonstrate knowledge and understanding in this strand: *modify, evaluate, function, aesthetic*

4. Technical Knowledge

a. Understand the terms 'functional' and 'aesthetic'
b. Apply their understanding of how to strengthen, stiffen and reinforce more complex structures in order to create more useful characteristics of products
c. Understand and demonstrate how mechanical and electrical systems have an input and output process
d. Make and represent simple electrical circuits, such as a series and parallel, and components to create functional products
e. Explain how mechanical systems such as levers and linkages create movement
f. Use mechanical systems in their products
g. Use key vocabulary to demonstrate knowledge in this strand: *laminating, corrugating, net, shell structure, current, switch, circuit, series, parallel, lever, fulcrum, force, counterweight.*

5. Cooking & Nutrition

a. Start to know when, where and how food is grown (such as herbs, tomatoes and strawberries) in the UK, Europe and the wider world
b. Begin to understand how cuisine in the UK has changed over time and some of the reasons why
c. Understand how to prepare and cook predominantly savoury dishes safely and hygienically
d. With support, use a heat source to cook ingredients showing awareness of the need to control the temperature of the heat source
e. Use a range of techniques such as mashing, whisking, crushing, grating, cutting, kneading and baking
f. Explain that a healthy diet is made up of a variety and balance of different food and drink, as represented in the Eatwell Guide and be able to apply these principles when planning and cooking dishes
g. Understand that to be active and healthy, nutritious food and drink are needed to provide energy and nutrients for the body
h. Prepare ingredients using appropriate cooking utensils
i. Measure and weigh ingredients to the nearest gram and millilitre
j. Start to follow a recipe independently
k. Use key vocabulary to demonstrate knowledge and understanding in this strand: *goods, crops, harvest, ingredients, flavour, savoury, nutrients.*

Year 5/6

1. Design

a. Use research to inform the design of innovative, functional and appealing products that are fit for purpose and aimed at a target market/user
b. Use their evaluation of a broad range of existing products to help generate their ideas
c. Design products that have a clear purpose and identify a specific user
d. Identify a list of design criteria, considering the purpose and user, and function versus aesthetics
e. Explain how particular parts of their products work using more technical vocabulary
f. Use annotated sketches, cross-sectional drawings and exploded diagrams, including computer-aided design, to develop and communicate their ideas
g. Generate a range of design ideas, evaluating and refining as they go, and clearly communicate final designs
h. Consider the availability of resources when planning out designs
i. Test out designs using prototypes
j. Work in a broad range of relevant contexts, for example conservation, the home, school, leisure, culture, enterprise, industry and the wider environment.
k. Use key vocabulary to demonstrate knowledge and understanding in this strand: *aesthetic, appeal, purpose, end user, function, specification, prototype*

2. Make

Planning:

a. Select from a wide range of tools and equipment, explaining their choices
b. Select from a range of materials and components according to their functional properties and aesthetic qualities
c. Independently plan steps, creating step-by-step plans as a guide to making

Practical skills and techniques:

d. Use a range of tools and equipment safely and appropriately and learn to follow hygiene procedures
e. Independently take exact measurements and mark out, to within 1 millimetre
f. Use a full range of materials and components, including construction materials and kits, textiles, and mechanical components
g. Cut a range of materials with precision and accuracy
h. Shape and score materials with precision and accuracy
i. Assemble, join and combine materials and components with accuracy
j. Demonstrate how to measure, make a seam allowance, use a simple pattern, tape, pin, cut, shape and join fabric with precision to make a more complex product
k. Join textiles using a greater variety of stitches, such as backstitch, whip stitch, blanket stitch
l. Refine the finish using techniques to improve the appearance of their product, such as sanding or a more precise scissor cut after roughly cutting out a shape
m. Use key vocabulary to demonstrate knowledge and understanding in this strand: *hygiene, pathogens, accuracy,* embellish

3. Evaluate

a. Complete detailed competitor analysis of other products on the market
b. Critically evaluate the quality of design, manufacture and fitness for purpose of products as they design and make
c. Evaluate their ideas and products against their own original design criteria, making changes as needed.
d. Evaluate the impact that key events in design and technology, (e.g. technological developments, and designs of individuals in design and technology) have had upon the world
e. Use key vocabulary to demonstrate knowledge and understanding in this strand: *competitor, target market, design specification, technological advance*

4. Technical Knowledge

a. Understand that materials and components have both functional and aesthetic properties that lend themselves to different products
b. Apply their understanding of how to strengthen, stiffen and reinforce more complex structures in order to create more useful characteristics of products
c. Understand and demonstrate that mechanical and electrical systems have an input, process and output
d. Explain how mechanical systems, such as cams, create movement and use mechanical systems in their products
e. Apply their understanding of computing to program, monitor and control a product
f. Use key vocabulary to demonstrate knowledge and understanding in this strand: *reinforce, exert, force, motion, linear, rotary, computerized, programming*

5. Cooking & Nutrition

a. Know, explain and give examples of food that is grown, reared (such as poultry and cattle) and caught (such as fish) in the UK, Europe and the wider world
b. Understand about seasonality, how this may affect the food availability and plan recipes according to seasonality
c. Understand that food is processed into ingredients that can be eaten or used in cooking
d. With increasing confidence and independence, prepare and cook a variety of predominantly savoury dishes safely and hygienically
e. Use a heat source with increasing confidence
f. Demonstrate how to use a range of cooking techniques, such as griddling, grilling, frying and boiling
g. Explain that foods contain different substances, such as calcium and protein, that are needed for health and be able to apply these principles when planning and preparing dishes
h. Adapt and refine recipes by adding or substituting one or more ingredients to change the appearance, taste, texture and aroma
i. Alter methods, cooking times and/or temperatures
j. Measure accurately and calculate ratios of ingredients to scale up or down from a recipe
k. Independently follow a recipe
l. Use key vocabulary to demonstrate knowledge and understanding in this strand e.g.: *agriculture, native, arable, livestock, dairy, import, export, produce (noun), seafood, game, protein, carbohydrate, fat, fibre, vitamins, minerals, aroma, texture.*

Castle Primary's Design and Technology Curriculum

Long Term Knowledge Plan – Year A

Autumn	**Textiles: Christmas Products** **Skills:** 1a, 1b, 1c, 1d, 1e, 1f, 1g, 2c, 2e, 2f, 2h, 2i, 2j, 2k, 2m, 2n, 3d, 3e, 3f, 3g, 3h **Knowledge:** • Learn traditional weaving techniques with ribbon, wool etc as used in many countries around the world • Design and make a product such as a felt Christmas tree ornament • Use running stitch to create the product and embellish it • Design, print and evaluate a repeating pattern onto fabric e.g. inspired by festive motifs.	**3D Modelling** **Skills:** 1a, 1b, 1c,1d, 1e, 1f, 1h, 1i, 1j, 1k, 2a, 2b, 2c, 2f, 2g, 2h, 2l, 3a, 3b, 3c, 3d, 3e, 3f, 4a, 4b, 4g **Knowledge:** • Look at examples of miniature dioramas • Design, make and evaluate a diorama model, such as a Stone Age dwelling.	**Electrical Products** **Skills:** 1a, 1b, 1c, 1d, 1e, 1f, 1g, 1h, 1i 1j, 1k, 2a, 2b, 2c, 2d, 2e, 2f, 2g, 2h, 2i, 3a, 3b, 3c, 3d, 3e, 4a, 4b, 4c, 4f **Knowledge:** • Describe and evaluate some of the key technological advancements in electricity that happened in the Victorian era, such as the incandescent lightbulb. • Evaluate a range of electrical products, such as children's bedside lamps. • Design and make a product that utilizes an electrical circuit, such as a bedside lamp for a child. • Create design criteria, and work to a design brief. • Consider both function and aesthetics in the design and manufacturing process • Evaluate the electrical product against the brief and design criteria.
Spring	**Stable Structures & Moving Toys** **Skills:** 1a, 1b, 1c, 1d, 1e, 1f, 1g, 2c, 2f, 2g, 2h, 2m, 2n, 3a, 3b, 3c, 3d, 3e, 3f, 3g, 3h, 4a, 4b, 4c, 4d **Knowledge:** • Evaluate existing stable structures • Know that shelters must be strong, stable, secure and safe, and why they must have these characteristics. • Evaluate existing toy vehicles • Assess materials and components to evaluate their suitability • Make a product featuring wheel mechanisms, such as a toy moon buggy • Embellish their toy to improve its aesthetic appeal • Evaluate their toy against the design criteria	**Mechanical Systems: Egyptian Shaduf** **Skills:** 1b, 1c, 1d, 1e, 1f, 1i, 1j, 1k, 2a, 2b, 2c, 2d, 2f, 2h, 2l, 3a, 3d, 3c, 3d, 3e, 3f, 4a, 4b, 4f, 4g **Knowledge:** • Design, make and evaluate a mechanical system, e.g. an Egyptian shaduf. • Know how the system is an example of scientific theory in practice, using some scientific and technical vocabulary to explain how it works. • Explore design ideas for components such as the secure base, counterweight, lever and fulcrum. • Make systems such as shadufs on different scales e.g. models, life size etc.	**Cams Mechanisms: Automata** **Skills:** 1a, 1c, 1d, 1e, 1f, 1g, 1h, 1i, 1j, 1k, 1l, 2a, 2b, 2c, 2d, 2e, 2f 2g, 2h, 2i, 3b, 3c, 3d, 3e, 4a, 4b, 4c, 4d, 4f • Know that cams are mechanical components that (as part of mechanism with a follower, crank handle and shaft) covert rotary motion into linear motion • Describe what an automaton is • Know that the word *automaton* comes from the Ancient Greek '*automatos',* which means *'self-moving'* or *'self-willed'.* • Explore how different shaped cams produce different effects and select the cams that produce the desired effect • Design, make and evaluate an automaton toy (e.g. based on an Ancient Greek myth) • Utilize at least 2 cams on one shaft in the mechanism created • Create a product that has a successful, functional mechanism and is aesthetically pleasing
Summer	**Food & Nutrition: Sensational Salads** **Skills:** 5a, 5b, 5c, 5d, 5e, 5f, 5g **Knowledge:** • Name different parts of the plant that vegetables (and fruits) come from • Know where different vegetables are grown • Evaluate existing salads • Use graters, peelers, juicers and safe knives to prepare healthy salads that relate to the EatWell Guide (e.g. vegetable salads, tuna salads or fruit salads).	**Food & Nutrition: From Tudor Times to Now** **Skills:** 3e, 5a, 5b, 5c, 5d, 5e,5h, 5i, 5j, 5k **Knowledge:** • Know how produce was kept fresh and preserved in Tudor times compared to now • Name fruits and vegetables that were native to Britain and so were eaten seasonally by people in Tudor times • Contrast this with fruits/vegetables that, although now commonplace in our lives, were extremely expensive, rare, or even unheard of, in Tudor times (e.g. bananas) as they are native to overseas countries. • Know how the discovery of the Americas influenced food in the late Tudor period. • Grow seasonal produce such as herbs, strawberries and tomatoes. • Prepare and cook dishes using the produce grown, e.g. strawberry smoothies, pesto pasta or tomato bruschetta.	**Food and Nutrition: Global Food** **Skills:** 5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j, 5k, 5l **Knowledge:** • Explain how and why diets around the world are based on similar food groups, referring to nutrients like protein and carbohydrate. • Understand what a staple crop is and name different staple crops globally. • Explain why rice is a good staple food, how it is grown, harvested and processed using dehydration for preservation, and is rehydrated for consumption • Cook a range of foods, such as rice • Follow recipes to cook dishes from countries such as China, Mexico and Germany.

Castle Primary's Design and Technology Curriculum

Long Term Knowledge Plan – Year B

Autumn	**Structures: Windmills**	**Battery Operated Lights**	**Textiles: Phone Cases**
	Skills: 1a, 1b, 1c, 1d, 1e, 1f, 1g, 2a, 2c, 2f, 2g, 2h, 2m, 2n, 3a, 3b, 3c, 3d, 3e, 3f, 3g, 3h, 4a, 4b, 4c, 4d	**Skills:** 1a, 1b, 1c, 1d, 1e, 1f, 1h, 1i, 1j, 1k, 2a, 2b, 2c, 2d, 2e, 2f, 2g, 2h, 2l, 3a, 3b, 3c, 3d, 3e, 3f, 4a, 4b, 4c, 4d, 4g	**Skills:** 1a, 1b, 1c, 1d, 1e, 1g, 1h, 1j, 1k, 2b, 2c, 2e, 2f, 2g, 2i, 2j, 2k, 2m, 3a, 3b, 3c, 3e
	Knowledge: • Learn what a windmill is and the significance of these buildings throughout history • Evaluate existing windmill products for their construction methods and materials • Design a windmill e.g. as a house for a mouse • Make a stable structure that forms the windmill building • Make a working windmill mechanism that has blades and can rotate freely • Evaluate their windmill against simple design criteria	**Knowledge:** • Explain how key events and individuals in design and technology have helped shape the world • Make and represent different types of circuits • Make and use switches • Develop design criteria and a design sketch • Select materials and components to make a light • Carry out an evaluation of their finished product	**Knowledge:** • Write a design specification for a mobile phone case • Generate a range of design ideas and clearly communicate the final design • Make a paper prototype and/or paper pattern for cutting fabric pieces from • Practise using different types of stitches and choose the best one to use on for the final phone case. • Organise ideas in a step-by-step plan • Select decorative techniques and fastenings according to their functional properties and aesthetic qualities. • Carry out a detailed evaluation of the finished product
Spring	**Textiles: Hand & Finger Puppets**	**Shell Structures**	**Marble Runs**
	Skills: 1a, 1b, 1c, 1d, 1e, 1f, 1g, 2c, 2e, 2f, 2g, 2h, 2i, 2j, 2k, 2n, 3a, 3b, 3c, 3d, 3e, 3f, 3g, 3h	**Skills:** 1a, 1b, 1c, 1d, 1e, 1f, 1g, 1h, 1j, 1k, 2a, 2b, 2c, 2f, 2g, 2h, 2k, 2l, 3a, 3b, 3c, 3d, 3f, 4a, 4b, 4g	**Skills:** 1a, 1b, 1c, 1d, 1f, 1g, 1h, 1i, 1j, 1k, 2a, 2b, 2e, 2g, 2h, 2i, 2m, 3a, 3b, 3c, 3d, 3e, 4a, 4b, 4f
	Knowledge: • Explore and evaluate different ways of joining fabric together e.g. gluing, stapling, sewing • Learn to sew a running stitch. • Draw designs of their puppet using simple design criteria. • Join two layers of fabric using a running stitch in order to create a simple hand or finger puppet • Add simple embellishments to their puppet to improve its aesthetic success • Evaluate their puppet against the design criteria.	**Knowledge:** • Investigate a collection of different shell structures (constructed and deconstructed), such as packaging, discussing parts of a net including the tabs • Develop a simple design brief for an intendent user • Make nets out of card, learning to score, cut and assemble • Find out which parts of the structure might need to be strengthened or stiffened through testing • Investigate ways of stiffening and strengthening their shell structures e.g. folding and shaping, corrugating, ribbing, laminating • Develop a prototype of their packaging • Use computer-aided design (CAD) to design and produce the net, text and graphics for their product • Evaluate their final product	• Investigate free standing structures such as existing marble run kits • Consider how historical events such as the invention of plastic, development of plastic injection moulding, and advances in computer-aided design and manufacture impacted significantly on possibilities for commercially available marble run toys • Use a wider range of tools and equipment to perform practical tasks accurately • Develop a range of practical skills to create bends • Select from and use materials and components to make a marble run • Evaluate and improve their design and technology work
Summer	**Mechanisms: Moving Monsters**	**Textiles: Cushions**	**Birdhouses**
	Skills: 1a, 1b, 1c, 1d, 1e, 1f, 1g, 2a, 2f, 2g, 2h, 2m, 2n, 3a, 3b, 3c, 3d, 3e, 3f, 3g, 3h, 4b, 4c, 4d	**Skills:** 1a, 1b, 1c, 1d, 1e, 1f, 1g, 1h, 1i, 1j, 1k, 2c, 2e, 2h, 2i, 2j, 2k, 2l, 3c, 3d, 3f, 4a	**Skills:** 1a, 1b, 1c, 1d, 1e, 1f, 1g, 1h, 1i, 1j, 1k, 2c, 2d, 2e, 2g, 2i, 2m, 3a, 3b, 3c, 3e, 4a, 4b, 4f
	Knowledge: • Learn about pivots, levers and linkages and investigate existing products that feature these mechanisms and components • Make different linkage mock-ups e.g. by varying the length, width and thickness of card • Create more than one design option and evaluate which one is the most successful/popular e.g. through peer assessment • Make a monster using working mechanisms and evaluate it against the design criteria.	**Knowledge:** • Learn embellishing techniques (such as cross-stitch and applique) and basic construction stitches (such as backstitch, running stitch or overstitch) • Design a product e.g. a cushion for an intended user that incorporates some embellishing techniques • Decorate the cushion and construct it using sewing techniques. • Evaluate the product	**Knowledge:** • Learn about birdhouses and why they are constructed for birds in our environment • Evaluate existing birdhouses, focussing on materials and components that are included for both functional and aesthetic reasons • Write a design specification • Design a bird house e.g. using computer-aided design, cross-sectional design or exploded diagrams • Write a step-by step plan • Make a prototype from a material such as cardboard and make refinements to the design following this • Measure dimensions and cut accurately using woodwork skills • Learn joining techniques for woodwork • Attach components such as hooks and hinges using appropriate tools and techniques • Evaluate the final product