

Design and Technology Scheme of Work

Aims

The national curriculum for design and technology 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.

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. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

When designing and making, pupils 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.

Progression in D & T involves developing skills in designing, making and evaluating:

D & T – progression in skills across Key Stage 2

Strand	Lower KS2	Upper KS2
Developing, Planning and Communicating Ideas	<p>Investigate similar products to the one to be made to give starting points for a design</p> <ul style="list-style-type: none"> • Draw/sketch products to help analyse and understand how products are made • Think ahead about the order of their work and decide upon tools and materials • Plan a sequence of actions to make a product • Record the plan by drawing (labelled sketches) or writing • Develop more than one design or adaptation of an initial design • Propose realistic suggestions as to how they can achieve their design ideas • Add notes to drawings to help explanations 	<p>Investigate products/images to collect ideas</p> <ul style="list-style-type: none"> • Sketch and model alternative ideas • Develop one idea in depth • Combine modelling and drawing to refine ideas • Plan the sequence of work using a storyboard • Record ideas using annotated diagrams • Use models, kits and drawings to help formulate design ideas • Make prototypes • Use found information to inform decisions • Use a computer to model ideas • Draw plans which can be read/ followed by someone else • Give a report using correct technical vocabulary
Food	<p>Develop sensory vocabulary/knowledge using, smell, taste, texture and feel</p> <ul style="list-style-type: none"> • Analyse the taste, texture, smell and appearance of a range of foods • Follow instructions • Make healthy eating choices from and understanding of a balanced diet • Join and combine a range of ingredients e.g. snack foods • Work safely and hygienically • Measure and weigh ingredients appropriately 	<p>Prepare food products taking into account the properties of ingredients and sensory characteristics</p> <ul style="list-style-type: none"> • Select and prepare foods for a particular purpose • Taste a range of ingredients, food items to develop a sensory food vocabulary for use when designing. • Weigh and measure using scales • Cut and shape ingredients using appropriate tools and equipment e.g. grating • Join and combine food ingredients appropriately e.g. beating, rubbing in • Decorate appropriately • Work safely and hygienically • Show awareness of a healthy diet from an understanding of a balanced diet
Textiles	<p>Understand seam allowance</p> <ul style="list-style-type: none"> • Join fabrics using running stitch, over sewing, back stitch • Explore fastenings and recreate some e.g. sew on buttons and make loops • Prototype a product using J cloths • Use appropriate decoration techniques e.g. appliqué(glued or simple stitches) • Create a simple pattern • Understand the need for patterns 	<ul style="list-style-type: none"> • Create 3D products using pattern pieces and seam allowance • Understand pattern layout • Decorate textiles appropriately often before joining components • Pin and tack fabric pieces together • Join fabrics using over sewing, back stitch, blanket stitch or machine stitching (closer supervision) • Combine fabrics to create more useful properties • Make quality products
Construction	<p>Incorporate a circuit with a bulb or buzzer into a model</p> <ul style="list-style-type: none"> • Create shell or frame structures, strengthen frames with diagonal struts • Make structures more stable by giving them a wide base • Prototype frame and shell structures • Measure and mark square selection, strip and dowel accordingly to 1cm • Use glue gun with close supervision (one to one) 	<p>Use bradawl to mark hole positions</p> <ul style="list-style-type: none"> • Use hand drill to drill tight and loose fit holes • Cut strip wood, dowel, square section wood accurately to 1mm • Join materials using appropriate methods • Incorporate motor and a switch into a model • Control a model using an ICT control programme • Use a cam to make an up and down mechanism. • Build frameworks using a range of materials e.g. wood, card corrugated plastic to support mechanisms • Use glue gun with close supervision
Sheet materials	<p>Cut slots</p> <ul style="list-style-type: none"> • Cut internal shapes • Use lolly sticks/card to make levers and linkages • Use linkages to make movement larger or more varied. • Use and explore complex pop ups • Create nets 	<ul style="list-style-type: none"> • Cut accurately and safely to a marked line • Join and combing materials with temporary, fixed or moving joinings • Use craft knife, cutting mat and safety ruler under one to one supervision if appropriate • Choose an appropriate sheet material for the purpose
Evaluating	<p>Identify the strengths and weaknesses of their design ideas</p> <ul style="list-style-type: none"> • Decide which design idea to develop • Consider and explain how the finished product could be improved • Discuss how well the finished product meets the design criteria and how well it meets the needs of the user. 	<p>Use the design criteria to inform their decisions about ways to proceed</p> <ul style="list-style-type: none"> • Justify their decisions about materials and methods of construction • Reflect on their work using design criteria stating how well the design fits the needs of the user • Identify what does and does not work in the product. • Make suggestions as how their design could be improved

The Scheme of Work for Design and Technology at CKJS aims to match the requirements of the national curriculum and provide an exciting, stimulating curriculum enabling our pupils to develop competence in their design and technological skills.

Pupils will develop these skills by following the following curriculum across Key Stage 2.

Year Group	Key Design and Technology Tasks/Areas of Study
3	Greek Pottery Tasting Greek food Greek Salad Recipes Sculpture – famous sculptors Designing and sewing finger puppets
4	Food Packaging Chocolate tasting Healthy Chocolate Recipes Fair Trade Pop Art Design Mosaics
5	Moving Water – bridges, aqueducts, dams, wells – gears and cams Bridge designers Pneumatics and hydraulics Food hygiene Making breads
6	Spitfires – electrical controlled lights/propellers Fashion Designers of the 20 th Century Fabric design Clay figurines Beach Hut Design Food during WW2 – rationing, healthy diet on a budget