Coads Green Primary School Knowledge and Skills Organiser
Design Technology

Purpose of Study

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.

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.

Intent

At Coads Green Primary School, we intend to equip the pupils with the skills and creativity to design and make products for a purpose.
Pupils will develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world.
They will 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.
They will learn to critique, evaluate and test their ideas and products and the work of others, in addition they will learn the principles of nutrition and apply them in their cooking.

Implementation

Design and technology is taught through a two year rolling programme and is linked to the main concept of the topic being taught. It is taught practically where pupils are encouraged to design and make products that solve real and relevant problems within a variety of contexts.
Pupils are encouraged to take risks, become resourceful, innovative, enterprising and capable members of the school and wider community. They are encouraged to critically evaluate the impact of design and technology on daily life and the wider world.

Capabilities Curriculum

The Capabilities Curriculum is a creative curriculum which measures social and emotional capabilities which improve children's learning, valuing the development of the whole child and preparing them for the future.

An Daras Trust have chosen to adopt a curriculum framework informed by pupil's social and emotional well-being. The class capability scores are used to inform a teachers approach to the lesson, which will help growth in these valuable characteristics.

These capabilities are evidenced as being necessary for future success, and by measuring them we are placing real value on them.

There are 7 capability strands: Managing feelings, Confidence, Communication, Relationships and Leadership, Planning and Problem-Solving, Creativity, Resilience and Determination.

Metacognition

Metacognition describes the processes involved when learners plan, monitor, evaluate and make changes to their own learning – the thinking about their thinking. Pupils are given opportunity to understand their own cognitive abilities, knowledge of tasks and strategies that could be used to support their learning. Pupils are also encouraged to self-reflect.

EYFS	In the Early Years Foundation Stage, design and technology forms part of the learning children acquire under the 'Knowledge and Understanding of the World' branch of the Foundation Stage curriculum, which also covers geography, history, ICT, and science. Our pupils will learn through first-hand experiences. They will be encouraged to explore, observe, solve problems, think critically, make decisions and to talk about why they have made their decisions. The pupils will learn through: **Constructing:** Learning to construct with a purpose in mind. **Structure and joins** **Using a range of tools** **Cooking techniques** **Exploration:** Pupils will dismantle things and learn about how everyday objects work. **Discussion:** There will be opportunities to discuss reasons that make activities safe or unsafe. They will also learn to record their experiences by, for example, drawing, writing and making a tape or model. **EYFS Areas of Learning codes** PSED- Making Relationships PSED(MR) PSED- Self-Confidence and Self-Awareness PSED(SC&SA) PSED- Managing Feelings and Behaviour PSED(MF&B) CAL- Listening and Attention CAL(L&A)

	CAL- Understanding CAL(U) CAL- Speaking CAL(S) PD- Moving and Handling PD(M&H) PD- Health and Self-Care PD(H&SC) L-Reading L(R) L-Writing L(W) M-Numbers M(N) M-Shape, Space and Measure M(SSM) UW- People and Communities UW(P&C) UW- The World UW(TW) UW- Technology UW(T) EAD- Exploring and Using Media and Materials EAD(EUMM) EAD- Being Imaginative EAD(BI)			
Reception	**Physical Development**	Progress towards a more fluent style of moving, with developing control and grace Develop small motor skills so they can use a range of tools competently, safely and confidently Use core muscle strength to achieve good posture when sitting at a table or on the floor		
	Expressive Arts and Design	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		
Early Learning Goals	**Physical Development**	**Fine Motor Skills**	Use a range of small tools, including scissors, paintbrushes and cutlery Begin to show care and accuracy when drawing	
	Expressive Art 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 processes they have used.	
Year A 1+2	**Autumn**	**Spring**	**Summer**	
	Changes	**Creatures**	**Time**	
Knowledge	**Textiles** Understand how simple 3D products are made using a template. Understand how to join fabrics using different techniques. Explore different finishing techniques.	**Cooking and Nutrition** Use the basic principles of a healthy and varied diet to prepare dishes. To be aware of the 5 food groups contained in the Eat-Well Plate.	**Construction** To know how to select from a range of tools and equipment to design and make an automatic plant waterer.	

	Explore different finishing techniques. Know and use technical vocabulary relevant to the project.	To understand where some food comes from.	To know how to select from a range of materials and components to perform the practical tasks. To understand how different materials and components can create different outcomes.
Designing Skills	**Understanding contexts, users and purposes:** To design a product that has a purpose Plan designs before making Make changes to a design as work progresses Be able to deconstruct boxes and tubes **Generating, developing, modelling and communicating ideas:** Use knowledge of existing products to help come up with ideas Develop and communicate ideas by talking and drawing		
Making Skills	**Planning:** Explain what I'm making and why Consider what I need to do next **Practical skills and techniques:** Select tools/equipment to cut, shape, join, finish and explain choices Measure, mark out, cut and shape, with support Begin to measure and join materials, with some support Describe differences in materials Suggest ways to make material/product stronger Choose suitable materials and explain choices Try to use finishing techniques to make product look good Work in a safe manner		
Evaluating Skills	**Own ideas and products:** Make simple judgements about their products and ideas against design criteria **Existing products:** Explain what products are Describe who and what the products are for Suggest how products work and how they are used Explain what materials products are made from Explain what they like and dislike about products		

Technical Skills	**Making products work:** Talk about the movement of simple mechanisms such as levers and sliders. Explain how freestanding structures can be made stronger, stiffer and more stable		
Textiles	Know that a 3-D textiles product can be assembled from two identical fabric shapes Measure, cut and join textiles to make a product with some support Be able to choose suitable textiles		
Cooking and Nutrition	Cut, peel and grate ingredients safely and hygienically. Measure or weigh using measuring cups Assemble ingredients Pour liquid ingredients accurately Know the origins of milk, beef, pork and lamb Be able to name and sort foods into the five groups in the eat-well plate and know that all food groups should be consumed in moderation Know how to use techniques such as cutting, peeling and grating		
Vocabulary	Design Structure Material Equipment Evaluate Construct Investigate Lever Slider Peeling Cutting Grating Eat-Well plate		
Year B 1+2	**Autumn**	**Spring**	**Summer**
	Home	**Moving**	**Life**
Knowledge	**Textiles** Understand how simple 3-D textile products are made, using a template to create two identical shapes. Understand how to join fabrics using different techniques Explore different finishing techniques Know and use technical vocabulary relevant to the project.	**Construction** To be able to select from a range of tools and materials when designing and making a toy car with an axle and wheels. To understand how to generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and,	**Food** Understand where food comes from. Know that all food comes from plants or animals Know that food has to be farmed, grown elsewhere (e.g., home) or caught Know some fruit and vegetables grow above and below ground

		where appropriate, information and communication technology. Explore and use mechanisms, in their products.	Know that food can be sorted into food groups Understand the need for a balanced diet
Designing Skills	**Understanding contexts, users and purposes:** To design a product that has a purpose Plan designs before making Make changes to a design as work progresses Be able to deconstruct boxes and tubes **Generating, developing, modelling and communicating ideas:** Use knowledge of existing products to help come up with ideas Develop and communicate ideas by talking and drawing		
Making Skills	**Planning:** Explain what I am making and why it fits the purpose Make suggestions as to what I need to do next. Choose suitable materials and explain choices depending on characteristics. **Practical skills and techniques:** Join materials/components together in different ways Measure, mark out, cut and shape materials and components, with support. Describe which tools I'm using and why Use finishing techniques to make product look good Work safely and hygienically		
Evaluating Skills	**Own ideas and products:** Make simple judgements about their products and ideas against design criteria **Existing products:** Explain what products are Describe who and what the products are for Suggest how products work and how they are used Explain what materials products are made from Explain what they like and dislike about products		
Technical Skills	**Making products work:** Use levers or sliders Begin to understand how to use wheels and axles Use materials to practice drilling and glue gunning materials to make and strengthen products		

	Measure materials Describe some different characteristics of materials Join materials in different ways Use joining, rolling or folding to make it stronger		
Textiles	Measure textiles Join textiles together to make a product using running stitch and explain how I did it Carefully cut textiles to produce accurate pieces Explain choices of textile Understand that a 3D textile structure can be made from two identical fabric shapes.		
Food and nutrition	Cut or peel ingredients safely and hygienically Measure or weigh using electronic scales Cook ingredients Mix wet and dry ingredients Explain hygiene and keep a hygienic kitchen Describe properties of ingredients and importance of varied diet Say where food comes from (animal, underground etc.) Describe how food is farmed, home-grown, caught Draw eat well plate; explain there are groups of food Describe "five a day" Cut, peel and grate with increasing confidence		
Vocabulary	Mechanism Properties Function Method Template Technique Sequence Strengthen	Levers Sliders Wheel Axle Eat-Well Plate	
Year A 3+4	**Autumn**	**Spring**	**Summer**
	Changes	**Creatures**	**Time**

Knowledge	**Construction** To be aware of the use and functionality of a Roman shield. To know and use the processes required to plan, make and evaluate a product fit for purpose. To understand how materials can be used to create structures which are strong and sturdy	**Textiles** To know and use the processes required to plan, make and evaluate a product fit for purpose. To explore and investigate textiles for appearance and functionality To understand that simple fabrics can be used to create 3D objects.	**Food** Understand the basic principles of a healthy and varied diet when preparing food from around the world.
Designing Skills	**Understanding contexts, users and purposes:** Improve upon existing designs, giving reasons for choices **Generating, developing, modelling and communicating ideas:** Disassemble products to understand how they work Work through plan in order Consider how good product will be		
Making Skills	**Planning:** Select suitable tools/equipment and techniques, explain choices. Begin to use them accurately Select appropriate materials, fit for purpose. **Practical skills and techniques:** Begin to measure, mark out, cut and shape materials/components with some accuracy Begin to assemble, join and combine materials and components with some accuracy Begin to apply a range of finishing techniques with some accuracy Work accurately to make cuts and holes Join materials Begin to make strong structures Alter product after checking, to make it better Use simple lever and linkages to create movement		
Evaluating Skills	**Own ideas and products:** Identify the strengths and areas for development in their ideas and products Consider the views of others to improve their work Refer to their design criteria as they design and make Use their design criteria to evaluate their completed products. **Existing products:** Explain how well products have been designed		

	Describe how well the products has been made and give reasons why materials have been chosen Describe what methods of construction have been used Explain how well the product works and how well the product achieves their purposes Suggest how well products meet user needs and wants Explain whether the products can be recycled or reused
Technical Skills	**Making products work:** Select appropriate tools / techniques Alter product after checking, to make it better Begin to try new/different ideas Use simple lever and linkages to create movement Use appropriate materials Work accurately to make cuts and holes Join materials Begin to make strong structures
Textiles	Join different textiles in different ways Choose textiles considering appearance and functionality Begin to understand that a simple fabric shape can be used to make a 3D textiles project Understand the need for a seam allowance Joining fabrics with appropriate stitching
Food and Nutrition	Prepare ingredients safely and hygienically using appropriate utensils Measure ingredients to the nearest gram accurately Describe the difference between the terms sweet and savoury Know how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source Knows how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking Know that a healthy diet is made up from a variety and balance of different food and drink, as depicted in the eat-well plate Can explain that to be active and healthy food and drink are needed to provide energy for the body
Vocabulary	Identify Peeling Spreading Kneading Outcome Chopping Refine Slicing Assemble Mixing Reinforce Baking Disassemble Resource

	Grating		
Year B 3+4	**Autumn**	**Spring**	**Summer**
	Home	**Moving**	**Life**
Knowledge	**Food** Understanding seasonality, know where and how a variety of ingredients are grown, reared caught and processed within the local area. To know how to read a recipe, weigh ingredients and prepare food in a safe and hygienic way To understand how the ingredients used combine and react to make a loaf of bread	**Construction** Design and make a volcano eruption using a wide variety of materials to ensure it is strong and stable.	**Textiles** To design, plan and make a tabard-style Stone Age tunic for a teddy. They will evaluate their final product against their plan and look at textile artists in the UK.
Designing Skills	**Understanding contexts, users and purposes:** Improve upon existing designs, giving reasons for choices Identify some of the great designers in all the areas of study to generate ideas for designs **Generating, developing, modelling and communicating ideas:** Disassemble products to understand how they work Work through plan in order Consider how good product will be Use software, where applicable, to evaluate product designs and adapt them		
Making Skills	**Planning:** Select suitable tools and equipment, explain choices in relation to required techniques and use accurately Select appropriate materials, fit for purpose; explain choices Work through plan in order. **Practical skills and techniques:** Realise if product is going to be good quality Measure, mark out, cut and shape materials/components with some accuracy Assemble, join and combine materials and components with some accuracy Apply a range of finishing techniques with some accuracy		
Evaluating Skills	**Own ideas and products:** Identify the strengths and areas for development in their ideas and products Consider the views of others to improve their work Refer to their design criteria as they design and make Use their design criteria to evaluate their completed products.		

	Existing products: Explain how well products have been designed Describe how well the products has been made and give reasons why materials have been chosen Describe what methods of construction have been used Explain how well the product works and how well the product achieves their purposes Suggest how well products meet user needs and wants Explain whether the products can be recycled or reused
Technical Skills	**Making products work:** Use ruler/tape accurately when measuring to carefully to avoid mistakes Know how to attempt to make a product strong Continue working on product even if original didn't work Know the components required to make a strong, stiff structure Select most appropriate tools / techniques Explain alterations to product after checking it Use levers and linkages to create movement Use pneumatics to create movement
Textiles	Think about user when choosing textiles Know how to make product strong Begin to devise a template Explain how to join things in different ways Understand that a simple fabric shape can be used to make a 3D textiles project
Food and Nutrition	Explain how to be safe / hygienic and follow own guidelines Present product well, making sure it is interesting, attractive and fit for purpose Begin to understand seasonality of foods Can explain that food can be grown, reared or caught in the UK and the wider world Describe how recipes can be adapted to change appearance, taste, texture, aroma Explain how there are different substances in food / drink needed for health Prepare and cook some savoury dishes safely and hygienically including, where appropriate, use of heat source Use range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.
Vocabulary	Alternative Peeling Communicate Chopping Project Slicing Guideline Grating

	Specification Prototype Research Analyse Mixing Spreading Kneading Baking		
Year A 5+6	**Autumn**	**Spring**	**Summer**
	Changes	**Creatures**	**Time**
Knowledge	**Construction** Apply their understanding of how to strengthen, stiffen and reinforce more complex structures to make a toy move.	**Food** Understand the basic principles of a healthy and varied diet when preparing pinwheel pizzas (ammonite fossils).	**Textiles** Mayan weaving To know that a 3D textiles product can be made from a combination of fabric shapes
Designing Skills	**Understanding contexts, users and purposes:** Evaluate the design of products so as to suggest improvements to the user experience **Generating, developing, modelling and communicating ideas:** Ensure products have a high-quality finish, using art skills where appropriate		
Making Skills	**Planning:** Work through plan in order To select suitable tools and equipment, explain choices in relation to required techniques **Practical skills and techniques:** Use selected tools and equipment accurately To select appropriate materials that are fit for purpose and explain choices Realise if product is going to be good quality To measure, mark out, cut and shape materials/components with some accuracy Assemble, join and combine materials and components with some accuracy Apply a range of finishing techniques with some accuracy Use a range of practical skills to create products e.g. Cutting, drilling, screwing, nailing and gluing Use innovative combinations of mechanics in product designs		
Evaluating Skills	**Own ideas and products:** Identify the strengths and areas for development in their ideas and products Consider the views of others, including intended users, to improve their work Begin to critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make Use their design to evaluate their ideas and products against their original design specification		

	Existing products: Investigate and analyse: How well products have been designed How well products have been made Why materials have been chosen What methods of construction have been used How well products work How well products achieve their purposes How well products meet user needs and wants How much products cost to make How innovative products are How sustainable the materials in products are What impact products have beyond their intended purpose
Technical Skills	**Making products work:** To select materials carefully, considering intended use of product and appearance Explain how product meets design criteria Measure accurately enough to ensure precision Ensure product is strong and fit for purpose Begin to reinforce and strengthen a 3D frame Refine product after testing Grow in confidence about trying new / different ideas Begin to use cams, pulleys or gears to create movement Incorporate switch into product
Textiles	Think about user and aesthetics when choosing textiles Be able to design and use own template Think about how to make product strong and look better Think of a range of ways to join things Begin to understand that a single 3D textiles project can be made from a combination of fabric shapes.
Food and Nutrition	That seasons may affect the food available How food is processed into ingredients that can be eaten Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms) Measure accurately and calculate ratios of ingredients to scale up or down from a recipe Know the seasonality of foods such as tomatoes and understand the role providers/supermarkets play in providing fruits ‘out of season’

	Explain how to be safe / hygienic and follow own guidelines Present product well - interesting, attractive and fit for purpose Understand food can be grown, reared or caught in the UK and the wider world Describe how recipes can be adapted to change appearance, taste, texture, aroma Explain how there are different substances in food / drink needed for health Prepare and cook some savoury dishes safely and hygienically including, where appropriate, the use of heat source Use range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.		
Vocabulary	Category Precise Dynamic Qualitative		
Year B 5+6	**Autumn**	**Spring**	**Summer**
	Home	**Moving**	**Life**
Knowledge	**Food (Pasties)** Understanding seasonality, know where and how a variety of ingredients are grown, reared caught and processed within the local area.	**Construction** Apply their understanding of how to strengthen, stiffen and reinforce more complex structures to make a toy move	**Textiles** To design, plan and make a shopping bag fit for purpose. Research fabric that may be used for their product and will evaluate their final product against their plan
Designing Skills	**Understanding contexts, users and purposes:** Create innovative designs that improve upon existing products Evaluate the design of products so as to suggest improvements to the user experience **Generating, developing, modelling and communicating ideas:** Use prototypes, cross sectional diagrams and computer aided designs to represent ideas Ensure products have a high-quality finish, using art skills where appropriate		
Making Skills	**Planning:** Create, follow, and adapt detailed step-by step plans Explain how product will appeal to audience; make changes to improve quality **Practical skills and techniques:** Use selected tools and equipment precisely Produce suitable lists of tools, equipment, materials needed, considering constraints Select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics Accurately measure, mark out, cut and shape materials/components		

	Accurately assemble, join and combine materials/components Accurately apply a range of finishing techniques Use techniques that involve a number of steps Be resourceful with practical problems
Evaluating Skills	**Own ideas and products:** Identify the strengths and areas for development in their ideas and products Consider the views of others, including intended users, to improve their work Begin to critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make Use their design to evaluate their ideas and products against their original design specification **Existing products:** Investigate and analyse: How well products have been designed How well products have been made Why materials have been chosen What methods of construction have been used How well products work How well products achieve their purposes How well products meet user needs and wants How much products cost to make How innovative products are How sustainable the materials in products are What impact products have beyond their intended purpose
Technical Skills	**Making products work:** Select materials carefully, considering intended use of the product, the aesthetics and functionality. Explain how product meets design criteria Reinforce and strengthen a 3D frame Refine product after testing, considering aesthetics, functionality and purpose Incorporate hydraulics and pneumatics Use cams, pulleys and gears to create movement Use different types of circuit in product Think of ways in which adding a circuit would improve product Program a computer to monitor changes in environment and control product
Textiles	Consider the user's wants/needs and aesthetics when choosing textiles Make product attractive and strong

	Make a prototype Use a range of joining techniques Consider how product might be sold Think carefully about what would improve product Understand that a single 3D textiles project can be made from a combination of fabric shapes.
Food and Nutrition	*Demonstrate a range of baking and cooking techniques* *Make a range of savoury dishes* *Create and refine recipes, including ingredients, methods, cooking times and temperatures* Understand a recipe can be adapted by adding / substituting ingredients Explain seasonality of foods Learn about food processing methods Name some types of food that are grown, reared or caught in the UK or wider world Adapt recipes to change appearance, taste, texture or aroma. Describe some of the different substances in food and drink, and how they can affect health Prepare and cook a variety of savoury dishes safely and hygienically including, where appropriate, the use of heat source. Use a range of techniques confidently such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.
Vocabulary	Economy Environment Sustainable Proportion Input Innovative