Co-op Academy Hillside Design Technology Curriculum Overview

At Co-op Academy Hillside Design & Technology curriculum is categorised into five strands:

- Structures
- Mechanisms
- Cooking and Nutrition
- Textiles
- Electrical Systems (KS2)

	Cooking and Nutrition (all taught Spring 2)	Mechanisms	Structures	Textiles	Electrical Systems
Y1	Fruit and Vegetable Smoothie	Pop up card: levers (Autumn 2)	Windmills and watermills Bromborough watermill (Summer 2)		
Y2	A Balanced Diet (healthy wrap)		Freestanding structures (Autumn 2)	Pouches (Summer 2)	
Y3	Seasonality (crumble)	Levers and linkages (Autumn 2)		Fastenings (Summer 2)	
Y4	What Could Be Healthier? (biscuits)		CAD Design Shell Structures (Aut 2)		Digital world - Electronic *charm (Summer 2)*
Y5	Adapting a Recipe (pasta)		Bridges Birkenhead tunnel approach, runcorn bridge (Summer 2)	Cushions (Autumn 2)	
Y6	Come Dine With Me (scouse)	Automata cars (Summer 2)			Steady Hand Games (Aut 2)

There are then four skills that run through each topic:

Design Make Evaluate Technical Knowledge

National Curriculum by themes and topics

Key stage 1 *National Curriculum D&T subject content*	*D&T Strands*	*Topics*	
Pupils should be taught to:		*Year 1*	*Year 2*
Design purposeful, functional, appealing products for themselves and other users based on design criteria	Design	All of these strands run throughout each unit, which is taught in a cycle of: • Research *(as part of this, children will research existing products; evaluate them and create a design criteria based on this research)* • Design *(as part of this, children will generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology)* • Technical (component) knowledge *(as part of this, children will develop their understanding of materials, components, as well as technical skills in areas such as joining materials)* • Make *(as part of this, children will plan the steps to complete their product, including the materials, components and tools chosen based on their characteristics. Children will apply relevant knowledge and understanding as part of this process.)* • Evaluate *(as well as children evaluating their final product against the design criteria, children will complete ongoing evaluation in their analysis of materials, components and tools, as well as reflecting on their relevant skills, evaluating which will be applied in the final product)*	
Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology	Design		
Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]	Make		
Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics	Make		
Explore and evaluate a range of existing products	Evaluate		
Evaluate their ideas and products against design criteria	Evaluate		
Build structures, exploring how they can be made stronger, stiffer and more stable	Technical Knowledge	Windmills	Free standing structures
Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.	Technical Knowledge	Pop up cards	

Cooking and Nutrition: Use the basic principles of a healthy and varied diet to prepare dishes	Technical Knowledge	Smoothie	Healthy Wraps
Cooking and Nutrition: Understand where food comes from	Technical Knowledge	Smoothie	Healthy Wraps

Key stage 2 *National Curriculum Computing subject content*	*D&T Strands*	*Topics*			
Pupils should be taught to:		*Y3*	*Y4*	*Y5*	*Y6*
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	Design	All of these strands run throughout each unit, which is taught in a cycle of: • Research *(as part of this, children will research existing products; evaluate them and create a design criteria based on this research. Children will demonstrate more awareness of the criteria specific to more discrete individuals or groups.)* • Design *(as part of this, children will generate, develop, model and communicate their ideas through more complex means, including discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design)* • Technical (component) knowledge *(as part of this, children will develop their understanding of materials, components, as well as technical skills in areas such as joining materials with increased levels of accuracy)* • Make *(as part of this, children will plan the steps to complete their product, including the materials, components and tools chosen based on their characteristics. Children will apply relevant knowledge and understanding as part of this process, completing it with increased levels of accuracy)* • Evaluate *(as well as children evaluating their final product against the design criteria, children will complete ongoing evaluation in their analysis of materials, components and tools, as well as reflecting on their relevant skills, evaluating which will be applied in the final product. In KS2, children will articulate the significance of individuals both locally and nationally in their contributions towards the world of Design and Technology)*			
Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	Design				
Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately	Make				
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	Make				
Investigate and analyse a range of existing products	Evaluate				
Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work	Evaluate				

Understand how key events and individuals in design and technology have helped shape the world	Evaluate				
Apply their understanding of how to strengthen, stiffen and reinforce more complex structures	Technical Knowledge		Shell Structures	Bridges Cushions	Steady Hand Games
Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]	Technical Knowledge	Levers and Linkages			Automata Toys
Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]	Technical Knowledge		Microbit technology		Steady Hand Games
Apply their understanding of computing to program, monitor and control their products	Technical Knowledge		Microbit technology		Steady Hand Games
Cooking and Nutrition: Understand and apply the principles of a healthy and varied diet	Technical Knowledge	Crumble	Biscuits	Pasta	Scouse
Cooking and Nutrition: Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques	Make	Crumble	Biscuits	Pasta	Scouse
Cooking and Nutrition: Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed	Technical Knowledge	Crumble	Biscuits	Pasta	Scouse

Overview of topics by year

Year 1	Mechanisms: Pop Up Card Children explore levers and sliders to make a pop up card	Food: Fruit and Vegetable Smoothie Children learn how to identify fruits and vegetables and then design and make a smoothie	Structures: Windmills Through the theme of windmills, pupils design and create their own structure and functioning windmill
Curriculum coverage	Design Designing for others Make Assembling accurately Creating different movements (up, down, along and around) Evaluate Testing a finished product Technical Knowledge Understanding what a mechanism is Understanding how to create different movement	Design Designing for others Make Chopping fruit and vegetables Using appropriate tools to blend fruit and vegetables Evaluate Evaluating and adapting designs Technical Knowledge Describing and grouping fruits by texture and taste Understanding the difference between fruit and vegetables	Design Designing for others Make Assembling different components to work together to create motion Assembling accurately Cutting neatly Evaluate Testing a finished product Technical Knowledge Developing awareness of different structures for different purposes Understanding how to turn 2D nets into 3D structures Understanding what mechanisms are
Cross curricular links	Maths - measuring length Geography/Computing - directional language	Science - plants (what happens as plants mature) - Aut 1 PSHE - healthy diets	Maths - measuring length Geography - physical geography within the local area (Spring 2)

Year 2	Structures: Animal enclosures Pupils explore existing structures in order to design, test and make their own free standing structure for an animal enclosure	Food: A Balanced Diet Pupils explore what makes a balanced diet and taste test combinations of different food groups before designing and making a wrap	Textiles: Pouches Children design and make their own wallet or purse, learning to use running stitch to join two pieces of fabric together

Curriculum coverage	Design Designing structures Make Measuring and cutting accurately, working to scale and following a design brief Evaluate Testing and adapting structures Researching structures Technical Knowledge Understanding how to join and stiffen materials Know how height affects structures ability to be freestanding, and how to address this	Design Designing a healthy wrap Make Preparing food safely and hygienically Chopping safely using the bridge grip Evaluate Conducting product research Evaluating a design Technical Knowledge Understanding how fruit and vegetables grow Knowing the food groups Understanding what makes a balanced diet	Design Considering purpose in the design process Make Threading a needle Sewing a running stitch Preparing fabrics for sewing Evaluate Discuss the making process and the finished product Technical Knowledge Identifying parts of a needle (point and eye) Understand the alternative ways of joining fabrics and embellishments
Cross curricular links	Maths - measuring length Geography - physical geography in the local area (Aut 2)	PSHE - healthy diet Science - plants (conditions for plant growth) - Aut 1	

Year 3	Mechanisms: Levers and Linkages Pupils learn about levers and linkages using fixed and loose pivots to create a moving storybook with multiple types of movement.	Food: Eating Seasonally Pupils learn about seasonality and how the climate a food is grown in can alter the way it tastes and make a crumble using seasonal ingredients	Textiles: Fastenings Pupils research different types of fabric fastenings before deciding which they want to use in their design for a book sleeve

	Design Designing to criteria Make making models based on design brief using a range of materials that are suitable Evaluate testing functionality of models. Technical Knowledge using range of key vocabulary understanding the function and different types of pivots understanding how to use different pivots to achieve a specific effect	Design Designing to criteria Make Safely preparing fruit and vegetables Following a recipe Evaluate Tasting and evaluating their dessert Technical Knowledge Knowing what foods are in season and when Understanding the benefits of foods by their colour Knowing how climate alters the sweetness of food	Design Designing tp criteria Make Selecting suitable tools Evaluate Researching existing products Technical Knowledge Understanding stitches and their benefits Knowing how to use templates
Cross curricular links		Geography - Y2 Climate detectives Summer 2 Science - seasonality and importance of nutrients (Spr 1)	

Year 4	*Structures: Shell Structures with CAD design* Pupils will understand the purpose of shell structures relating to food packaging. They will use CAD to accurately create nets to be used as part of their final product.	*Food: What could be healthier?* Pupils adapt a recipe by adding or altering the ingredients and then work in groups to create a final design that falls within a set budget and design brief	*Electrical Systems: Microbit Light* Pupils learn about the new digital revolution, and can write a program that initiates a flashing LED panel, or another pattern, on the virtual micro:bit when a button is pressed.

Curriculum coverage	Design Developing designs using the views of others to improve them Using nets and tabs to design and make the shell structure Make Measuring, marking,cutting and assembling accurately Using software to accurately create nets Evaluate Testing products Technical Knowledge Understanding of key vocabulary Understanding of CAD software and tools available within this Understanding the nets needed to make a 3D product	Design Working within a design brief Make Following but adapting a recipe Preparing food hygienically Evaluate Discuss flavours identified Technical Knowledge Understanding the costs behind professional food preparation Understanding the factors that contribute to product design	Design Designing to criteria for intended audiences and purposes Make use a range of materials and select the best fit for the task construct from design brief Evaluate evaluate creation against design brief evaluate overall effectiveness of creation Technical Knowledge understand how key events have helped shape the new world understand use of electrical systems in work understand and apply computing knowledge
Cross curricular links	Maths - measuring length	Maths - measuring mass and/or liquid PSHE, PE, Science - digestive system in Spr 1	Children have already covered electricity in Y4 science. Children will go on to look at electrical circuits in year 6 Science. Computing - coding units throughout

Year 5	Textiles: Cushions Pupils learn how to join fabrics together by using appropriate stitches. They will also apply a variety of embellishment techniques (decorative stitching, sequins, buttons) to create an appealing product.	Food: Adapting a recipe Pupils adapt a bolognese recipe by adding or altering ingredients and learn about the ethical and hygienic issues of food	Structures: Bridges Pupils explore and experiment with a range of different bridge structures, forces and components involved in bridge building, before designing and making their own to test to destruction

Curriculum coverage	Design Designing for a purpose Make Accurately cutting and joining Evaluate Comparing 3D object to 2D design Technical Knowledge Understand how to join fabrics together Understand the most effective stitch to use for different purposes Use a variety of embellishment techniques	Design Adapting a recipe Make Cutting and preparing vegetables hygienically Cooking meat safely Evaluate Tasting and adapting the dish during cooking process Technical Knowledge Know where meat comes from and understand ethical issues around beef Know nutritional values of packaged food	Design Design arch and truss bridges Make Selecting materials and equipment according to functional properties Working with increasing accuracy in practical tasks Use triangulation for bracing Evaluate Testing to destruction to evaluate the successful and unsuccessful properties of a design and its materials Technical Knowledge Understanding the importance of compression and tension in bridge structures
Cross curricular links		Maths - measuring mass and/or liquid PSHE, PE, - healthy diets Geography - climate change (Spring 2)	Science - properties of materials (Aut). Have completed Forces unit in Summer 1

Year 6	Electrical Systems: Steady Hand Games Pupils create electromagnetic toys and more complex electronic circuits to create a steady hand game	Food: Come Dine With Me Working in groups, children research and prepare a three course meal that will be taste tested and scored as well as researching the journey of their main ingredient ,from 'farm to fork'	Mechanisms: Automata Toys Pupils develop their woodworking skills and explore cams to design and make mechanical window displays

Curriculum coverage	Design Generating ideas through sketching and discussion Modelling ideas through prototypes Make Cutting and assembling with accuracy Evaluate Adapting products to improve functionality Testing finished product Technical Knowledge Creating and using electric circuits in their designs Knowing how to make electromagnetic motors	Design Using recipe books/websites Make Working with food hygienically and safely Working to a timescale Evaluate Tasting and evaluating their own food Technical Knowledge Understanding the risks of meat or fish when not cooked or stored properly Understanding safe storage of meat/fish	Design Experimenting with cams to make suitable design decisions Make Measuring, marking and cutting woodwork accurately Selecting appropriate equipment Assembling components accurately Evaluate Checking accuracy of work Technical Knowledge Naming types of cam Knowing how cams impacts follower movements
Cross curricular links	Science - electricity (Aut 2)	Maths - measuring mass and/or liquid PSHE, PE - healthy diets Science -circulatory system in Summer term	Maths - measuring length

Nursery	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2

Topic	Who am I? How do I feel? Community, where do I come from? Where do I live - locality) When I was young, When I am older	Cultural Celebrations Halloween bonfire night, Diwali, Christmas, Autumn to winter, animals.	Down in The Jungle Jungle habitat Jungle animals	People who help us. What is a superhero? Everyday superheroes,	At the farm farm animals, Seasons, plants, growing, food,	Save the seas The world, hot place cold place, around the world, animals,
Enrichment Activities	Baking porridge	Pumpkin carving			Healthy eating week	
Physical Development	Physical activity is vital in children's all-round development, enabling them to pursue happy, healthy and active lives. Gross and fine motor experiences develop incrementally throughout early childhood, starting with sensory explorations and the development of a child's strength, co-ordination and positional awareness through tummy time, crawling and play movement with both objects and adults. Suggested tools: pencils for drawing and writing, tweezers, paintbrushes, scissors, knives, forks, and spoon. Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor.					
Physical Development Fine motor Gross motor		Develop knowledge of how to use mark making equipment with a comfortable grip making connections between the movements marks made. Know how to thread large beads onto a lace independently. Use a spoon to feed themself.	Begin to show some control with a pencil. Develop fine motor skills e.g. when threading small beads onto a string. Begin to use cutlery with less support.	Developing the ability to independently use a fork to feed themself. To know how to recognise that one hand is more effective than the other.	To know how to use scissors to make snips in paper.	Develop confidence in using one handed tools with support.
EAD	• Create houses out of different materials		• Create models of vehicles		• Make your own role play and small world resources.	
	Explore, use, and refine a variety of artistic effects to express their ideas and feelings					

Reception	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2

Topic	All about me How do I feel? community, where do I come from? where do I live - locality) when I was young, when I am older	Autumn Woodland Halloween bonfire night, Diwali, Christmas, Autumn to winter, animals, local area.	Polar Regions The world, hot place cold place, around the world, animals,	Journeys Modes of transport, comparing places, families, animals and their young, travelling the world, journeys.	Growing Seasons, life cycles, food, changes, traditional tales.	Superheroes What is a superhero? Everyday superheroes
Enrichment Activities	Baking gingerbread men	Pumpkin carving			Healthy eating week	
Physical Development	Develop fine motor skills so that they can use a range of tools competently, safely, and confidently. Suggested tools: pencils for drawing and writing, tweezers, paintbrushes, scissors, knives, forks, and spoon.					
Physical Development Fine motor Gross motor	Develop confidence in using one handed tools with support.		Know how to hold a pencil effectively and form most letters correctly Combine different movements with ease and fluency		Develop the foundations of a handwriting style which is fast, accurate and efficient.	Confidently uses a range of small tools. Develops accuracy and care when drawing. Safely use a range of large and small apparatus indoors and outside, alone and in a group.
EAD	- Create a boat/bridge - Create a woodland pop up book		• Making caves • Decorations for the party • Making parachutes • Bake cakes. • Make cardboard tube penguin. • Make a hat.			
Workshop in provision supports independent application of skills	Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park. Explore different materials and develop their ideas 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.		Return to and build on their previous learning, refining ideas and developing their ability to represent them Create collaboratively sharing ideas, resources, and skills.		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.	