

Whole School Design Technology Overview

Intent

The OCL Curriculum Statement of Intent has been carefully considered for each curriculum area to ensure the content designed meets this at every opportunity.

The context that our children and young people live in:

- Our children live in a world where they require the skills and qualifications, flexibility, emotional intelligence and expertise to be leaders and to thrive as human beings.
- Our children live in world where accepting themselves as individuals and celebrating who they are is key in navigating a complex and ever-changing environment.
- Our children live in a world where they need to feel a sense of ability to change things for the better and have self efficacy.
- Our children live in a world where they need a network of relationships and a network of support to thrive and excel.
- Our children live in a world where early development of vocabulary skills is the single most important factor to get right as early as possible.

We want our children and young people to:

- Be inspired to improve the world around them.
- Have the ambition, skills and expertise to thrive in a fast changing, interconnected and communication rich world, with the confidence and technical expertise to thrive.
- Have a network that supports them.
- Be comfortable in who they are and able to continuously explore who they are becoming.
- Be rich in language with a passion for learning.
- Seek to include others, be other-centred and celebrate difference.
- Have a values approach to life and a sense of what is right and wrong through the lived experience of the 9 habits.

The Design and Technology curriculum aims to engage, inspire and challenge pupils, equipping them with the knowledge and skills to experiment, invent and create their own works of design. As pupils progress, they will be able to think critically and develop a more in-depth understanding of design and technology. The curriculum builds skills and knowledge over time but is designed to enable pupils know how design and technology reflects our history, and contributes to the culture, creativity and wealth of our nation.

The intent is for pupils to produce creative work, exploring their ideas and recording their experiences; become proficient in planning, designing and ultimately creating new and original designs using the language design and technology and to know about great designers, and understand the historical and cultural development of technology over the years. A key intent of our curriculum is to have a range of designers reflecting modern British society ie different genders, ages, sexualities, gender identities, races, religion and beliefs and disabilities. The list of designers below should be used across the curriculum adding depth and context to the work being undertaken.

Therefore, we focus on developing character, competence and community. The Design &Technology curriculum specifically meets the OCL statement of intent by focussing on character, competence and community in the following areas:

Character:

To be self-confident, motivated problem solvers inspired by engineers, designers, chefs and architects with the drive to change our world and perspectives

Competence:

D&T develops critical thinking and problem-solving skills that are applied to real life contexts. We strive to empower our pupils to become competent problem solvers able to use the language, technical knowledge and understanding of the processes of design to solve real life problems

Community:

Design Technology is all around us. The skills developed will enable our pupils to play an active part in the world giving insight into the worlds of textiles, electronics, mechanics, structures, food production and design whilst understanding how key events and individual have helped to shape our global world

Designers



Nadiya Hussain Chef



Robert Sabuda Pop Up Book Artist



Divyansh Sheth Ski Filmmaker



Charles Wikström Swings & Slides



Margaret & Richard Steiff Soft Toys



Michael Calnes Chef



James Dyson Vacuum



William Henry Hoover Vacuum



Nisha Katona Chef



Stephen Sauvestre Eiffel Tower



Isambard Brunel Bridges



Fiona Fairhurst Swimwear



Thomas Edison Lightbulbs



Lewis Latimer Filament



Charles Macintosh Waterproofing



Mary Anderson Windscreen Wiper



Michael O'Hare Chef



Mary Van Brittan Brown Alarms



James Blyth Wind Turbine



Lisa Allen Chef



George de Mestral Velcro



James Hargrave Spinning Jenny



Isaac Singer Sewing Machine



Thomas Farnalls Pritch Iron Bridge



Sarah Duck Structural Engineer



John Baker American Shalwar

Implementation

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery Theme: Selecting appropriate materials	Materials: To compare houses. Design and build a house	Cause and effect: puppet theatres and shadow puppets	Vehicles: Compare different transport. To design and make a moving vehicle	Materials: Design and build an appropriate home for an animal	Eco-link: Compare minibeast homes. Design and make an 'ugly bug' home.	Properties: Floating/sinking To build a boat that will float.
Reception Theme: Colour and shape	Moving parts: To make a split pin version of yourself (paper craft)	Shaping materials: To make something to carry what you may find on an Autumn walk	Materials: Experiment with materials to build a rocket to take teddy up to the moon	Materials: Design and build a habitat for a specific animal (design brief)	Eco-link: To build a sustainable minibeast home	Materials / Fashion Design a uniform for one of our emergency services
Year 1 Theme: shaping materials	Evaluation products: head wear; foot wear; jackets and coats	Shaping paper and card to make Christmas cards, decorations and baubles	Shaping plastics and junk materials to make a sledge to slide across the snow and ice	Evaluating egg boxes. Make a decorated egg in a secure box.	Shaping wood to make a bug hotel. Camouflage	Make an ice lolly. Move sand from one place to another
Year 2 Theme: design brief	Fabric – dye. 1960s's fashion. Concept of design brief and prototype.	Different ways of joining: split pins, pipe cleaners. Developing a design brief for an audience.	Axels. Cutting and shaping wood and card. Make a wheeled car.	Design and make a functioning egg cup.	Salad ingredients. Creating German, French, Italian and Spanish salads.	Wooden framed emergency shelter
Year 3 Theme: construction	Construction. How to move soil. How sand is used. Problem solving – finding gold flakes.	How pyramids were built. Types of bridges. Brunel. Making a bridge	Prisms, mirrors kaleidoscopes. Upcycling	Fabric – sewing. How to make an Ancient Greek wearing a toga.	Making a fridge magnet. Electromagnets.	Making a rocket.
Year 4 Theme: solving problems	Gears and pulleys in solving problems.	Lever in Christmas cards. Stitched embroidery. Christmas food.	Using cogs and gears to make a windmill. Solving rotation problems to make a weather vane.	Using knitting and sewing to make a product.	Using circuit boards to make a game and a figure with moving parts	Make an erupting volcano.
Year 5	Axels, chassis and car bodies. Using motors and belts to make a car move in a straight line.	Make a structure to and the insides for the Globe Theatre	Mexican headdress and food for Mexico day.	CAD CAM building of a glider	Technological wonders and features in the USA. Skyscrapers	Making a sustainable dwelling for North American Indians
Year 6	Market research. Hygienic storage and treatment of food. Vegetarian meals.	Know how to make a Victorian sampler and a soft toy to sell.	Make a product out of reclaimed plastic to sell.	Control technology and Circuit boards to make sequenced lights.		Business project. Profit, loss, how to make money.

Progression Points against the Core Concepts

An Oasis Academy Clarksfield designer can...

Core Concepts	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Designing	<p>Three and Four-Year-Olds</p> <p><u>Expressive Arts and Design</u></p> <p>Explore different materials freely, in order to 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.</p>	<p>Use knowledge of existing products to support plans for a similar product. Describe, explore and investigate products that have been disassembled. Use construction kits, pictures, templates, mock ups and captions to plan and design. Talk about and describe the tools and materials needed in order complete the key tasks within a plan.</p>	<p>Use knowledge of a range of products to inform plans and designs. Talk about and disassemble products and describe their function. Use simple prototypes, labelled sketches and detailed instructions in plans and designs. Talk in depth about ideas, plans and reasons for choices.</p>	<p>Use research to develop design criteria that are fit for purpose. Disassemble products and describe in detail their functions. Use annotated sketches, cross-sectional, exploded diagrams and increasingly complex prototypes. Support discussions about ideas, plans and designs with relevant information.</p>	<p>Generate plans and designs based on research and ideas that take account of the users' views and the intended purpose. Produce detailed designs and plans using prototypes, commentary and diagrams that include accurate measurements. Link discussions about ideas, plans and designs to the investigation, disassembly and evaluation of a range of products describing in detail their parts and their function.</p>	<p>Clarify and justify plans, designs and ideas by drawing upon and using a range of relevant sources of information. Produce detailed designs and plans drawn to scale from a range of viewpoints, using pattern pieces and computer-aided design packages effectively. Discuss ways in which ideas, plans and designs are formed and modify to ensure that the design criteria are met effectively.</p>	<p>Use research and exploration, such as the study of different cultures, to identify and understand user needs. Develop and communicate ideas using annotated sketches, detailed plans, 3D and mathematical modelling, oral and digital presentations and computer based tools.</p>
Making	<p>Three and Four-Year-Olds</p> <p><u>Understanding the World</u> Explore how things work</p> <p><u>Physical Development</u> Use the right resources to carry out their own plan Use one-handed tools and equipment, for example, making snips in paper with scissors</p> <p>Children in Reception</p> <p><u>Physical development</u> Develop their small motor skills so that they can use a range of tools competently, safely and confidently.</p> <p><u>Expressive Arts and Design</u></p>	<p>Explore and talk about the characteristics of an increasing range of materials. Select and use simple tools to cut and join a range of materials. Use a straight edge to mark lines for cutting. Join edge to edge using glue. Curl paper. Select from a range a finish to improve the appearance of a product.</p>	<p>Select materials and components according to known characteristics and functions. Select and use an increasing range of tools to cut, shape and join materials and components. Use a ruler to measure and mark lines for cutting. Insert paper fasteners for card linkages. Make and use gluing tabs.</p>	<p>Select from and use a wide range of materials and components according to both functional and aesthetic qualities. Select and use tools and equipment to measure, mark out and shape materials and components. Make increasingly complex paper models, mock-ups and templates. Select the most effective finish to enhance the</p>	<p>Select a range of appropriate tools to cut, shape and join materials and components effectively. elect and use tools and equipment to measure, mark out and shape materials and components accurately. Use a G clamp effectively. Join and combine materials and components in permanent and temporary ways.</p>	<p>Select a range of appropriate tools to cut, shape and join materials and components with accuracy and precision. Use an increasing range of tools and equipment to measure, mark out and shape materials and components accurately. join and combine a range of materials and components using the most effective permanent and temporary way.</p>	<p>Select from and use a wider, more complex range of materials, components and ingredients, taking account of their properties. Select from and use specialist tools, techniques, processes, equipment and machinery precisely. Use a broad range of manufacturing techniques including handcrafted skills and machinery to manufacture products precisely.</p>

	<p>Return to and build on their previous learning, refining ideas and developing their ability to represent them Create collaboratively, sharing ideas, resources and skills.</p> <p>ELG</p> <p><u>Physical Development</u> Use a range of small tools, including scissors, paintbrushes and cutlery.</p> <p><u>Expressive Arts and Design</u> Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</p>	<p>Follow procedures for safety and hygiene.</p>	<p>Make simple paper models, mock-ups and templates. Select an appropriate way to improve the appearance of a product. Follow procedures for safety and hygiene.</p>	<p>appearance of a product. Follow procedures for safety and hygiene.</p>	<p>Use a hack saw and bench hook safely. Make a range of complex paper models, mock-ups and templates. Produce a well-finished product that fulfils the functional and aesthetic design criteria. Follow procedures for safety and hygiene.</p>	<p>Make and adapt where necessary complex mock-ups and templates. Identify and apply an appropriate finishing technique to ensure a high quality end product which meeting the design criteria. Follow procedures for safety and hygiene.</p>	<p>Produce ordered sequences and schedules for manufacturing products, detailing resources required. Produce costings using spreadsheets for products they design and make. Follow procedures for safety and hygiene and understand the process of risk assessment.</p>
Evaluating	<p>Children in Reception</p> <p><u>Expressive Arts and Design</u> Return to and build on their previous learning, refining ideas and developing their ability to represent them</p> <p>ELG</p> <p><u>Expressive Arts and Design</u> Share their creations, explaining the process they have used.</p>	<p>Talk about and describe key features of a range of products. Explore and evaluate a range of existing products. Begin to evaluate the success of the product in terms of function and aesthetic criteria.</p>	<p>Investigate and compare a range of similar existing products. Compare and contrast the similarities and differences of products with the same function. Evaluate ideas and products against design criteria; and suggest ways in which products can be improved.</p>	<p>Investigate and begin to analyse a range of existing products. Use knowledge of similarities and differences between products with the same function to support identification of most effective product. Evaluate ideas and products against own design criteria, taking into account the views of others.</p>	<p>Investigate and use analysis of existing products to inform own work. Identify from a range the key features and functions needed to create an effective and efficient working product. Give reasons, supported by factual evidence for the success of aspects of a product.</p>	<p>Use analysis of existing products supported by accurate factual information to inform own work. Test and evaluate products to identify the variants which may affect the function of a product. Give reasons, supported by factual evidence for the success of aspects of a product and provide considered solutions to resolve those parts that could be improved.</p>	<p>Understand developments in D&T, its impact on individuals, society and the environment. Test, evaluate and refine ideas and products against a specification, taking into account the views of intended users. Analyse the work of past and present professionals and others to develop and broaden understanding. Investigate new and emerging technologies.</p>
Technical Knowledge: Axles, Pulleys and Gears			<p>Construct cubes of different sizes from a net.</p>	<p>Construct cuboids of different sizes from a net. Attach wheels to a chassis using an axle, e.g. cotton reels and dowel. Use pencils or tubes as rollers to move an</p>	<p>Attach a fixed axle to a chassis and add wheels ensuring that they can move freely. Describe in detail the way in which an axle and chassis help a vehicle to move.</p>	<p>Design and build a working model where the direction of movement can be controlled, e.g. with a chassis with a pivoting axle. Explain how a belt and pulley system</p>	<p>Understand how more advance mechanical systems used in their product.</p>

				<p>object across the floor.</p> <p>Construct a pulley that allows a load to travel horizontally along a rope.</p> <p>With support attach a fixed axle to a chassis and add wheels ensuring that they can move freely.</p> <p>Construct a simple pulley using rope over a horizontal bar to raise an object off the ground.</p>	<p>Use a range of different ways to attach an axle to a chassis, e.g. card triangles, drilled holes, cable clips and clothes pegs.</p> <p>Identify, describe and evaluate products that contain pulleys.</p>	<p>can be used to reverse the direction of rotation and alter the plane of rotation by 90 degrees.</p> <p>Explain how the number of teeth of a gear affects the speed of rotation.</p>	
<p>Technical Knowledge: Electrical and Mechanical Components</p>						<p>Explore and describe how switches can be used in a range of circuits to control components, e.g. lights in a lighthouse, a movement sensor in a burglar alarm.</p> <p>Discuss in depth the hazards and safety issues associated with electricity.</p> <p>Explore and describe how electrical circuits can be created and controlled.</p> <p>Apply appropriate safety measures when constructing circuits.</p> <p>Explore and discuss ways in which electricity can be used to control movement.</p> <p>Explore and use an increasing range of complex control system, e.g., a light sensor.</p> <p>Explore and explain how the direction</p>	<p>Use computer-based systems to control an increasing range of components.</p> <p>Apply computing and use of electronics to embed intelligence in products that respond to inputs.</p> <p>Control outputs such as actuators and motors.</p> <p>Make use of sensors to detect heat, light, sound and movement.</p> <p>Explore and describe how an electric motor can be used in a circuit.</p> <p>Explore and program a simple control device.</p>

						and speed of an electrical motor can be controlled.	
Technical Knowledge: Mechanics – Sliders and Levers			<p>Deconstruct a simple slider and describe how it works.</p> <p>Construct a simple slider independently.</p> <p>Make a lever by joining card strips with paper fasteners.</p> <p>Construct increasing complex sliders. Join levers to make linkages to create moving parts.</p> <p>Create a range of sliders and levers to produce horizontal and vertical movement.</p>	<p>Deconstruct and reconstruct a range of sliders and levers.</p> <p>Vary the position of the pivot point to lift a load using a lever.</p>	<p>Combine sliders and levers to produce a range of movements.</p> <p>Choose and use a range of sliders and levers accurately to create a range of effects.</p>	<p>Use a range of technical vocabulary to describe the properties and functions of mechanisms.</p> <p>Discuss the relationship between a cam and follower, an off-centre cam, a peg cam, a pear-shaped cam and a snail cam.</p> <p>Describe the way in which a cam changes rotary motion into linear motion.</p> <p>Identify the cam within a simple mechanism and explain how movement is changed.</p>	<p>Construct a simple pneumatic system with one moving part.</p> <p>Construct a pneumatic with two moving parts.</p> <p>Analyse and evaluate the efficiency of pneumatic systems.</p> <p>Generate questions to investigate and compare the efficiency of pneumatic systems.</p>
Technical Knowledge: Structures		<p>Construct a range of simple structures using simple construction kits.</p> <p>Make a structure more stable by widening the base.</p> <p>Make a simple card hinge.</p> <p>Make a square frame from strip wood using triangular card joints.</p>	<p>Deconstruct and assemble the net of basic 3D shapes.</p> <p>Strengthen 2D frames by adding diagonal bracing struts.</p> <p>Make a rectangular frame from strip wood.</p> <p>Use materials to make simple joints, glue, tape and paper clips</p>	<p>Deconstruct and assemble the net of a range of basic 3D shapes.</p> <p>Create nets of increasingly complex 3D shapes which include the addition of gluing tabs.</p> <p>Make rectangular frames of different sizes using strip wood, reinforcing with cross braces.</p> <p>Use a range of materials to make joints.</p>	<p>Use a range of increasing methods to strengthen 3D structures and frames.</p> <p>Investigate measure and record the load tolerance of different structures and find ways of improving a structures loadbearing capacity.</p> <p>Build a range of structures using a wide range of effective materials.</p> <p>Explain in detail why some structures fail.</p>	<p>Create nets and templates accurately in a range of sizes.</p> <p>Join 2D frames to create 3D structures.</p> <p>Reinforce and strengthen 3D framework using the concept of 'triangulation'.</p> <p>Use a range of materials to make joints e.g., card strips, elastic bands, thread and ties, and plastic tubing.</p>	<p>Make use of specialist equipment to mark out materials.</p> <p>Select the most appropriate method to strength 3D structures and frames.</p> <p>Apply a range of finishing techniques, including those from art and design, to a broad range of materials including textiles, metals, polymers and woods.</p> <p>Use a wider more complex range of materials, components and ingredients, taking into account their properties.</p>

<p style="text-align: center;">Textiles</p>	<p>Three and Four-Year-Olds</p> <p><u>Expressive Arts and Design</u></p> <p>Explore different materials freely, in order to develop their ideas about how to use them and what to make.</p>	<p>Understand how to join fabrics using different techniques e.g. running stitch, glue, stapling.</p> <p>Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons.</p>	<p>Understand how simple 3-D textile products are made, using a template to create two identical shapes.</p> <p>Know and use technical vocabulary relevant to the project.</p>	<p>Understand how to securely join two pieces of fabric together.</p> <p>Know and use technical vocabulary relevant to the project.</p>	<p>Understand the need for patterns and seam allowances.</p> <p>Know how to strengthen, stiffen and reinforce existing fabrics.</p>	<p>Know a 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics.</p> <p>Fabrics can be strengthened, stiffened and reinforced where appropriate.</p>	
<p style="text-align: center;">Cooking and Nutrition:</p>	<p>Three and Four-Year-Olds</p> <p><u>PSED</u></p> <p>Make healthy choices about food, drink, activity and toothbrushing.</p> <p>Children in Reception</p> <p><u>PSED</u></p> <p>Know and talk about the different factors that support their overall health and wellbeing.</p>	<p>Sort and classify food into food groups, e.g. vegetables, pulses, cereals, dairy etc. Talk about the importance of food</p> <p>Measure and weigh accurately using cups and spoons.</p> <p>Work safely and hygienically.</p>	<p>Know about food production and which meat food stuff comes from. Know about animal welfare.</p> <p>Talk about what needs to be done in order to work safely and hygienically.</p> <p>Measure and weigh using standard units and scales.</p> <p>Chop and slide using safety techniques.</p>	<p>Sort and classify an increasing range of food according to specific food groups, e.g. proteins, carbohydrates, fats etc</p> <p>Gain an understanding of the ways in which specific food groups apply to the principles of a health and varied diet.</p> <p>Identify what needs to be done in order to work safely and hygienically when working on a range of tasks.</p> <p>Convert measure and weigh using standard and imperial units.</p>	<p>Understand seasonality, know where and how a variety of ingredients are grown, reared, caught and processed.</p> <p>Talk about and give reasons for the need to work safely and hygienically.</p> <p>Talk about the impact of changing proportions within a recipe and use knowledge of food and cooking to generate own recipes.</p> <p>Talk in scientific terms about the physical and chemical changes that take place when food is cooked, e.g. heated and cooled</p> <p>Link food consumption to digestion and understand the need to consume carbohydrates to produce energy</p>	<p>Talk about how the properties of certain foods can affect the final product.</p> <p>Know and understand the practice needed in terms of food hygiene and kitchen safety.</p> <p>Select the appropriate methods and equipment for measuring, e.g. time, dry goods, liquids etc.</p>	<p>Understand the source, seasonality and characteristics of a broad range of ingredients.</p> <p>Understand the principles of cleaning to prevent cross-contamination, chilling foods thoroughly and reheating food until steaming hot.</p> <p>Understand and apply the principles of nutrition and health including the implications of excess and deficiency.</p> <p>Become competent in a range of cooking techniques, e.g. selecting and preparing ingredients, application of heat, seasoning dishes, combining ingredients</p>