

Design and Technology Progression Framework

OLS	Designing Developing, planning and communicating ideas	Making Working with tools, equipment, materials and components to make quality products	Evaluating Evaluating processes and products	Technical knowledge C1 Axles, pulleys and gears C2 Electrical and mechanical components C3 Mechanisms C4 Structures C5 Textiles
Working towards	<ul style="list-style-type: none"> Explain what they are making and which materials they are using. Select materials from a limited range that will meet a simple design criteria e.g. shiny. Select and name the tools needed to work the materials e.g. scissors for paper. Explore ideas by rearranging materials. Describe simple models or drawings of ideas and intentions. Discuss their work as it progresses. 	<ul style="list-style-type: none"> Begin to create their design using basic techniques. Start to build structures, joining components together. Look at simple hinges, wheels and axles. Use technical vocabulary when appropriate. Begin to use scissors to cut straight and curved edges and hole puncher to make holes. Explore using/ holding basic tools such as a saw or hammer Use adhesives to join material. 	<ul style="list-style-type: none"> Say what they like and do not like about items they have made and attempt to say why. Begin to talk about their designs as they develop and identify good and bad points. Start to talk about changes made during the making process. Discuss how closely their finished products meet their design criteria. 	<ul style="list-style-type: none"> C1 Use junk modelling materials to build boxes. Use simple construction materials to make a vehicle. Explore and use construction kits containing gears. C2 Use the senses to explore battery powered toys e.g. cars, trains, tills etc. Talk about electrical equipment in the home. E.g. kettle, phone, microwave. Explore the use of bulbs, batteries and wires. C3 Explore and talk about books containing flaps and moving pictures. Construct a simple slider with support. Construct a simple lever with support. C4 Explore and investigate a range of simple, large scale construction materials. E.g. cardboard boxes. Explore building bridges and towers using large and small scale construction materials. E.g. Duplo, cardboard Make simple 2D structures using straws C5 Explore, sort and group textiles by texture, colour etc. Cut and stick fabrics together. Apply simple finishing techniques. E.g. fabric cravens, gluing on feathers etc.
Oakwood Learning Stage 1	<ul style="list-style-type: none"> Begin to draw on their own experience to help generate ideas and research conducted on criteria. Begin to understand the development of existing products: What they are for, how they work, materials used. Start to suggest ideas and explain what they are going to do. Understand how to identify a target group for what they intend to design and make based on design criteria. Begin to develop their ideas through talk and drawings. Make templates and mock ups of their ideas in card and paper or using ICT. 	<ul style="list-style-type: none"> Begin to make their design using appropriate techniques. Begin to build structures, exploring how they can be made stronger, stiffer and more stable. Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products. With help measure, mark out, cut and shape a range of materials. Explore using tools e.g. scissors and use a hole punch safely. Begin to assemble, join and combine materials and components together using a variety of temporary methods e.g. glues or masking tape. Begin to use simple finishing techniques to improve the appearance of their product. 	<ul style="list-style-type: none"> Start to evaluate their product by discussing how well it works in relation to the purpose (design criteria). When looking at existing products explain what they like and dislike about products and why. Begin to evaluate their products as they are developed, identifying strengths and possible changes they might make. 	<ul style="list-style-type: none"> C1 Deconstruct and reconstruct boxes accurately. Attach wheels to a chassis using an axle, e.g. cotton reels and dowel. Use pencils or tubes as rollers to move objects across the floor. C2 Use remote controlled devices e.g. Bee bots Talk about how common electrical equipment works and how it can be used safely. C3 Deconstruct a simple slider and describe how it works. Construct a simple slider independently. Make a lever by joining card strips with paper fasteners. C4 Construct a range of simple structures using simple construction kits. Make a structure more stable by widening the base. Make a square frame from strip wood using triangular card joints. Make a simple card hinge. C5 Talk about and begin to select textiles based on characteristics of an increasing range of materials. Use a simple template. Join fabrics using glue, staples and thread. Apply an increasing range of finishing techniques. E.g. painting and printing.

<p>Oakwood Learning Stage 2</p>	<ul style="list-style-type: none"> Start to generate ideas by drawing on their own and other people's experiences. Begin to develop their design ideas through discussion, observation, drawing and modelling. Identify a purpose for what they intend to design and make. Understand how to identify a target group for what they intend to design and make based on design criteria. Develop their ideas through talk, drawings and labelling parts. Make templates and mock ups of their ideas in card and paper or using ICT. 	<ul style="list-style-type: none"> and materials; use correct vocabulary to name and describe them. Build structures, exploring how they can be made stronger, stiffer and more stable. With help measure, cut and score with some accuracy. Learn to use hand tools safely and appropriately. Start to assemble, join and combine materials in order to make a product. Demonstrate how to cut, shape and join fabric to make a simple product. Use basic sewing techniques. Start to choose and use appropriate finishing techniques based on own ideas. 	<ul style="list-style-type: none"> Evaluate their work against their design criteria. Look at a range of existing products explain what they like and dislike about products and why. Start to evaluate their products as they are developed, identifying strengths and possible changes they might make. With confidence talk about their ideas, saying what they like and dislike about them. 	<ul style="list-style-type: none"> C1 Construct cubes of different sizes from a net. With support attach a fixed axle to a chassis and add wheels ensuring that they can move freely. Construct a simple pulley using rope over a horizontal bar to raise an object off the ground. Use construction kits with gears to construct a line of gears that turn C2 Use remote controlled devices e.g. Bee bots Talk about how common electrical equipment works and how it can be used safely C3 Deconstruct a range of sliders and describe how they work. Construct increasingly complex sliders. Join leavers to make linkages to create moving parts. C4 Construct a range of simple structures using simple construction kits. Strengthen 2D frames by adding diagonal bracing struts. Make a rectangular frame from strip wood. Use materials to make simple joints using glue, tape and paper clips C5 Talk about similarities and differences between textiles based on the characteristics of an increasing range of materials. Use a simple pattern with increasing accuracy.
<p>Oakwood Learning Stage 3</p>	<ul style="list-style-type: none"> With growing confidence generate ideas for an item, considering its purpose and the user. Start to order the main stages of making a product. Identify a purpose and establish criteria for a successful product. Understand how well products have been designed, made, what materials have been used and the construction technique. Learn about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products. Start to understand whether products can be recycled or reused. Know to make drawings with labels when designing. When planning explains their choice of materials and components including function and aesthetics. 	<ul style="list-style-type: none"> Select a wider range of tools and techniques for making their product i.e. construction materials and kits, textiles, food ingredients, mechanical components and electrical components. Explain their choice of tools and equipment in relation to the skills and techniques they will be using. Start to understand that mechanical and electrical systems have an input, process and output. Start to understand that mechanical systems such as levers and linkages or pneumatic systems create movement. Know how simple electrical circuits and components can be used to create functional products. Measure, mark out, cut, score and assemble components with more accuracy. Start to work safely and accurately with a range of simple tools. Start to think about their ideas as they are developed and how they might be improved. 	<ul style="list-style-type: none"> Start to evaluate their product against original design criteria e.g. how well it meets its intended purpose. Begin to disassemble and evaluate familiar products and consider the views of others to improve them. Evaluate key designs of individuals in design and technology has helped shape the world. 	<ul style="list-style-type: none"> C1 Construct cuboids of different sizes from a net. Attach a fixed axle to a chassis and add wheels ensuring that they can move freely. Construct a pulley that allows a load to travel horizontally along a rope. Use construction kits with gears to mesh gears at right angles C2 Use remote controlled devices e.g. Bee bots Talk about how common electrical equipment works and how it can be used safely. C3 Deconstruct and reconstruct a range of sliders and leavers. Vary the position of the pivot point to lift a load using a lever. Construct a simple pneumatic system with one moving part C4 Deconstruct and assemble the net of basic 3D shapes. Join 2D frames to make 3D structures. With support, make rectangular frames of different sizes using strip wood, reinforcing with cross braces. Use a range of materials to make joints. C5 Give reasons for the selection of fabrics and techniques based on knowledge of characteristics. Make and use a simple paper pattern. Join fabrics in a range of different ways, using zips, tie clasp, toggles, press studs and buttons. Use a wide range of finishing techniques

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Learning Stage
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- Start to generate ideas, considering the purposes for which they are designing- link with Mathematics and Science.
- Confidently make labelled drawings from different views showing specific features.
- Develop a clear idea of what has to be done, planning how to use materials, equipment and processes. Then suggesting alternative methods of making, if the first attempts fail.
- Identify the strengths and areas for development in their ideas and products.
- When planning consider the views of others, including intended users, to improve their work.
- Learn about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.
- When planning explain their choice of materials and components according to function and aesthetic.

- Select a wider range of tools and techniques for making their product safely.
- Know how to measure, mark out, cut and shape a range of materials, using appropriate tools, equipment and techniques.
- Start to join and combine materials and components accurately in temporary and permanent ways.
- Know how mechanical systems such as cams, pulleys or gears create movement.
- Understand how more complex electrical circuits and components can be used to create functional products.
- Continue to learn how to program a computer to monitor changes in the environment and control their products.
- Understand how to reinforce and strengthen a 3D framework.
- Now sew using a range of different stitches, to weave and knit.
- Demonstrate how to measure, tape or pin, cut and join fabric with some accuracy.
- Begin to use finishing techniques to strengthen and improve the

- Evaluate their products carrying out appropriate tests.
- Start to evaluate their work both during and at the end of the assignment.
- Be able to disassemble and evaluate familiar products and consider the views of others to improve them.
- Evaluate key designs of individuals in design and technology has helped shape the world.

- C1 Construct cuboids of different sizes from a net.
- Attach a fixed axle to a chassis, experimenting with different ways to do this, and add wheels ensuring that they can move freely.
- Construct a pulley that allows a load to travel horizontally along a rope.
- Use construction kits with gears to mesh gears at right angles
- C2 Describe how a simple battery powered circuit can be controlled by different kinds of switches.
- Identify key features of electrical safety.
- Create simple circuits.
- C3 Construct and reconstruct a range of sliders and leavers.
- Vary the position of the pivot point to lift a load using a lever.
- Construct a pneumatic system with two moving parts.
- C4 Deconstruct and assemble the net of a range of basic 3D shapes.
- Join 2D frames to make 3D structures.
- Make rectangular frames of different sizes using strip wood, reinforcing with cross braces.
- Use a range of materials to make joints
- C5 Support reasons for selections with justifiable evidence and facts.
- Make and use a paper pattern that includes seam allowance.
- Sew using a range of stitches including, backward running stitch and over sewing.
- Use a wide range of techniques to add colour, texture and pattern to fabric.

Oakwood
Learning Stage
5

- Start to generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional, exploded diagrams, prototypes and pattern pieces.
- Begin to use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose.
- With growing confidence apply a range of finishing techniques, including those from art and design.
- Draw up a specification for their design- link with Mathematics and Science.
- Use results of investigations and information sources, including ICT when developing design ideas.
- With growing confidence select appropriate materials, tools and techniques.
- Start to understand how much products cost to make, how sustainable and innovative they are and the impact products have beyond their intended purpose.

- Select appropriate materials, tools and techniques e.g. 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.
- Understand how mechanical systems such as cams or pulleys or gears create movement.
- Know how more complex electrical circuits and components can be used to create functional products and how to program a computer to monitor changes in the environment and control their products.
- Understand that mechanical and electrical systems have an input, process and output.
- Begin to measure and mark out more accurately.
- Demonstrate skills in using different tools and equipment safely and accurately with growing confidence. Cut and join with accuracy to ensure a good quality finish to the product.
- Weigh and measure accurately (time, dry ingredients, and liquid)

- Start to evaluate a product against the original design specification and by carrying out tests.
- Evaluate their work both during and at the end of the assignment.
- Begin to evaluate it personally and seek evaluation from others.
- Evaluate key designs of individuals in design and technology has helped shape the world.

- C1 Describe in detail the way in which an axle and chassis help a vehicle to move.
- Use a range of different ways to attach an axle to a chassis, e.g. card triangles, drilled holes, cable ties, clothes pegs.
- Identify, describe and evaluate products that contain pulleys and drive belts.
- Create pulleys and drive systems that can be driven by a motor or computer
- C2 Explain and describe how an electric motor can be used in a circuit. Discuss in depth the hazards and safety issues associated with electricity. Use a remote controlled device to switch lights on and off. (Inc. computer control packages)
- C3 Create a range of sliders and levers to produce horizontal and vertical movement.
- Combine sliders and levers to produce a range of movements.
- Generate questions to investigate and compare the efficiency of pneumatic systems. Identify the cam within a simple mechanism and explain how movement is changed.
- C4 Create nets of increasingly complex 3D shapes which include the addition of gluing tabs.
- Reinforce and strengthen 3D framework using the concept of 'triangulation.'
- Explain in detail why some structures fail.
- Use a range of materials to make joints. E.g. card strips, elastic bands, thread and ties and plastic tubing
- C5 Select appropriate materials to create a product.
- Create increasingly complex patterns and templates with more than one part that are accurately measured.
- Use a sewing machine to join and decorate fabric.
- Identify the most effective finishing techniques in order to maximise the aesthetic value of the product.

Oakwood
Learning Stage
6

- Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, and pattern pieces.
- Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose.
- Accurately apply a range of finishing techniques, including those from art and design.
- Draw up a specification for their design- link with Mathematics and Science.
- Plan the order of their work, choosing appropriate materials, tools and techniques.
- Suggest alternative methods of making if the first attempts fail.
- Identify the strengths and areas for development in their ideas and products.
- Know how much products cost to make, how sustainable and innovative they are and the impact products have beyond their intended purpose.

- Confidently select appropriate tools, materials, components and techniques and use them.
- Use tools safely and accurately.
- Assemble components to make working models.
- Aim to make and to achieve a quality product.
- With confidence pin, sew and stitch materials together to create a product.
- Demonstrate when make modifications as they go along.
- Construct products using permanent joining techniques
- Understand how mechanical systems such as cams or pulleys or gears create movement.
- Know how more complex electrical circuits and components can be used to create functional products and how to program a computer to monitor changes in the environment and control their products.
- Know how to reinforce and strengthen a 3D framework.
- Understand that mechanical and electrical systems have an input, process and output.
- Use finishing techniques to strengthen and improve the appearance of their product using appropriate equipment including

- Evaluate their products, identifying strengths and areas for development, and carrying out appropriate tests.
- Evaluate their work both during and at the end of the assignment.
- Record their evaluations using drawings with labels.
- Evaluate against their original criteria and suggest ways that their product could be improved.
- Evaluate key designs of individuals in design and technology has helped shape the world.

- C1 Design and build a working model where the direction of movement can be controlled. E.g. a chassis with a pivoting axle.
- Explain how a belt and pulley system can be used to reverse the direction of rotation and alter the plane of rotation by 90 degrees. Explain how the number of teeth of a gear affects the speed of rotation.
- C2 Explore and describe how switches can be used in a range of circuits to control components. E.g. lights in a lighthouse, movement sensors in burglar alarms.
- Discuss in depth the hazards and safety issues associated with electricity. Explore and program a simple control device.
- C3 Choose and use a range of sliders and levers accurately to create a range of effects.
- Analyse and evaluate the efficiency of pneumatic systems.
- Describe the way in which a cam changes rotary motion into linear motion.
- Discuss the relationship between a cam and follower, an off-centre cam, a peg cam, a pear shaped cam and a snail cam.
- C4 Create nets and templates accurately in a range of sizes.
- Use a range of increasing methods to strengthen 3D structures and frames.
- Investigate, measure and record the load tolerance of different structures and find ways of improving a structure's load bearing capacity.
- Build a range of structures using a wide range of effective materials
- C5 Select appropriate materials to create a product.
- Use a broad range of material joining techniques including, stitching, mechanical fastenings and adhesives.
- Investigate and develop skills in modifying the appearance of materials including textiles and other manufactured materials. E.g. dying and applique. Identify the most effective finishing techniques in order to maximise the aesthetic value of the product