

St William's Catholic Academy – Design Technology Progression of Skills and Objectives

| | EYFS | Key Stage 1 | Lower Key Stage 2 | Upper Key Stage 2 | Key Stage 3 |
|----------------|---|--|--|---|--|
| Design Process | <ul style="list-style-type: none"> - Discuss what a product does or needs to do - Explore the qualities of a range of materials - Make to create an outcome. - Explain why they chose their materials. - Explain what they have made. | <ul style="list-style-type: none"> -Work from a basic brief to generate ideas and design a simple product fit for purpose and audience. – Explore suitability of common materials before making a choice. - Show awareness of some products similar to their design. - Develop ideas, communicating and recording them in a suitable way (e.g. design book, design page, IT, mind map) - Make a simple mock-up. - Make a final product. - Evaluate their final product – what went well? Did they follow the brief? | <ul style="list-style-type: none"> - Work from a brief to design an appealing, functional product fit for purpose and audience. - Explore some possible materials, conducting a simple test to ensure suitability before making a choice. - Show awareness of products similar to their own. - Develop an idea, communicating and recording it in a suitable way (e.g. annotated design page, diagrams, IT) Perform basic tests, make simple prototypes/pattern pieces as appropriate. Create a final idea and translate this into a final product which fits the brief. Evaluate their final product – what went well? Did they follow the brief? How could they improve their design? | <ul style="list-style-type: none"> - Work from a brief with a simple constraint (e.g. audience / purpose) to design an appealing, functional product. - Research a range of materials, conducting tests as appropriate before selecting the best choice. - Research products similar and different to their own to inform their own design. - Develop a design idea, communicating and recording it via a plan and a labelled diagram. - Test ideas using prototypes/creating pattern pieces and where relevant computer aided design. - Develop and make a final product, based on testing, which meets the brief criteria. - Evaluate their final product, including discussion amongst peers to assess their product against the brief and consider improvements. | <ul style="list-style-type: none"> Create own brief from a given situation. - Produce a detailed design specification, identifying function, target audience, aesthetics, style, material, cost and size considerations. - Carry out detailed research looking at material properties for a range of materials (e.g. fabrics, wood, metal, polymer & paper) - Identify a range of materials and suitability to a given purpose, based on the material properties. - Research and critically analyse areas necessary for design ideas / product development e.g. <ul style="list-style-type: none"> o Analyse similar products for; function, target audience, aesthetics, style, material, cost and size considerations / ingredient's and methods used. o The work of past and present designers, o Design influences themes -design movements / biomimicry. o Size considerations etc - Create a range of design proposals which meet given criteria (e.g. specification / target audience needs / cultures/ themes / dietary requirements etc). - Design ideas drawn 3D, rendered and with detailed annotation, discussing materials and construction / ingredients and method. - Review design ideas for suitability (against specification, target audience needs, environmental issues, dietary requirements etc). - Use design idea testing to inform design development to create a suitable final design proposal. - Create mock up models, templates, test dishes -using CAD as appropriate. - Create a production plan (plan of making), identifying tools, equipment, ingredients, method as appropriate. - Create a detailed final evaluation, reviewing tools and equipment used and skills developed, user testing of final product / dish, identify potential improvements. |

Resistant Materials

- Begin to cut and tear materials.
- Stick and glue materials together.
- Use junk objects to create their own designs.
- Begin to consider how they join materials together.

- Follow basic procedures for safety.
- Cut materials safely using scissors.
- Tear, fold and curl materials.
- Join using gluing and taping.
- Begin to use a simple hinge.
- Select materials and tools based on their properties.
- Create products based on a design.
- Explore and use simple mechanisms [e.g. levers, sliders, wheels and axles], in their products.
- Build structures, exploring how they can be made stronger, stiffer and more stable.

- Follow procedures for safety.
- Cut, tear and shape materials with increasing accuracy.
- Use a wider range of joining methods (e.g. fasteners, tabs, flange)
- Choose appropriate materials and tools for a product based on their functional properties and aesthetics.
- Strengthen, stiffen and reinforce a product using suitable materials.
- Make mechanical /moving elements (e.g. pulleys, levers and linkages)
- Choose appropriate materials by testing their properties using a prototype.
- Incorporate a simple electrical system into their product.*

- Follow procedures for safety with a wider range of tools and processes.
- Cut and shape materials based on their design with increasing accuracy.
- Choose appropriate tools and methods to cut and form a wider range of materials.
- Choose appropriate materials by testing their properties using prototypes, justifying their choices.
- Make mechanical /moving elements (e.g. gears, cams and pneumatics)
- Use a wider range of joining methods (e.g. inserts, wrap, gusset, notch)
- Incorporate a more complex electrical system into their designs (e.g. more than one component / adding a switch).
- Use computing to program, monitor and control their products.*

- Be competent in workshop health and safety, to be able to identify potential hazards and understand how to avoid them in the workshop
- Use specialist tools and equipment with accuracy and independence.
- Understand how to correct manufacture errors as they arise.
- Understand the difference between similar tools and be able to correctly chose the appropriate tool (e.g. Hegner Saw, Coping Saw, Tenon Saw)
- Be competent using tools and equipment for timber, metal & polymers.
- Have a knowledge of the use of motion and mechanical systems (e.g the use of CAM's)
- To have knowledge of a range of resistant materials and their environmental impact (Timbers; hardwood, softwood and manufactured boards, Metals; ferrous and non-ferrous, Polymers; thermoplastic and thermosetting plastics)
- Accurately dimension and mark out materials following given dimensions /plans. Using the correct tools and equipment (e.g. steel rule, try square, engineers square, marking gauge etc)
- To have knowledge of permanent and temporary joining methods for a range of materials (e.g. Timbers; traditional wood joints, components; screws. Metals; rivets, Plastics; solvent glue)
- To have knowledge of finishing methods and finishes for a range of materials (e.g. Sanding, Timbers; Oil, Wax, Varnish, Wood Stain, Metal; Filing/abrasives, Polish, Paint etc)
- Be able to incorporate the use of CAD /CAM into products where possible
- To understand the use of electronics and electronic components
*links to science
- To understand the considerations of products are created in industry (considerations of accuracy, efficiency, cost, quantity, quality, jigs, templates etc)

| | | | | | |
|--|---|---|---|--|--|
| <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Textiles</p> | <ul style="list-style-type: none"> - Stick and decorate textiles with support. - Thread beads onto a string. - Begin to cut fabric using scissors. | <ul style="list-style-type: none"> - Cut textiles using scissors and a template. - Decorate textiles using crayons, paint or sticking. - Join textiles using glue. - Use a running stitch to join textiles using pre-prepared holes. - Create simple weaving using paper or large strips of fabric. | <ul style="list-style-type: none"> - Cut textiles with scissors safely. - Thread a needle and tie a knot. (e.g. wool/embroidery needle) - Use a running stitch to join textiles. - Decorate textiles using stamping, printing and simple embellishment. - Weave using a cardboard loom. | <ul style="list-style-type: none"> - Use seam allowance and back stitch to join textiles to create a simple product (e.g. A cushion or soft toy). - Use a pattern/template to mark and cut fabric into a specific shape - Use cross stitch, running stitch or filling stitch. - Use applique - Thread a needle and tie a knot, including finishing a thread and starting a new one within a project. - Choose appropriate materials for a textile product based on its use. - Weave using a variety of materials. - Sew a button or bead onto a project. | <ul style="list-style-type: none"> - Use different fastenings to create a functional product. - Create own pattern pieces to cut fabric into shapes for their own design. - Use back stitch and/or running stitch to construct a basic product (eg toy or cushion). - Use a range of decorative techniques to add designs to fabric. - Understand how to use a range of dye techniques (tie dye, marbling) to add colour and pattern to plain fabric. - To understand the difference between decorative and constructive techniques. - Understand how to use a sewing machine for decorative (machine embroidery) and constructive purposes. - Be able to identify appropriate market level for different techniques. - Develop understanding of roles within the textiles industry. - To understand the differences and properties of a range of natural and manmade fabrics - To understand the impact of the textiles / fashion industry on the environment. |
| <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Food and Nutrition</p> | <ul style="list-style-type: none"> - Mix pre-prepared ingredients with the support of an adult, safely and hygienically - Use a blunt knife to spread butter or jam (or alternative) on a cracker or bread. - Understand that fruit and vegetables grow, and which ones are grown in the UK. | <ul style="list-style-type: none"> - Cut soft foods safely and hygienically using an appropriate tool. - Measure using measuring cups and spoons. - Assemble ingredients to make a simple recipe. - Discuss what a healthy and varied diet should look like, naming and sorting using the five main groups. * - Know where a range of fruits and vegetables come from. * | <ul style="list-style-type: none"> - Cut a range of foods safely and hygienically with an appropriate tool. - Measure ingredients using scales or jugs. - Follow recipes, starting to use techniques such as peeling, chopping, slicing, mixing, spreading, baking or kneading. - Cook using a pan or oven safely (with supervision and support). - Know where a wider range of foods come from. - Discuss the importance of a range of varied and nutritious foods. * - Discuss the importance of a balanced diet to provide energy for a healthy active lifestyle. * | <ul style="list-style-type: none"> - Discuss why we need to store and handle food hygienically (micro-organisms).* - Measure ingredients with a degree of accuracy using an appropriate measuring device. - Scale recipes up or down accordingly. - Design their own simple savoury recipes and test them. - Use a range of baking and cooking techniques with increasing confidence (e.g. boiling, frying, baking, grilling, steaming, roasting, microwaving) - Begin to explain why a recipe or meal is healthy or not, giving reasons based on their understanding.* | <p>Development of Upper KS2 criteria plus in depth study of the following:</p> <ul style="list-style-type: none"> - Analyse similar products for; function, target audience, aesthetics, style, material, cost and size considerations / ingredients and methods used. - The work of past and present designers, - Design influences themes -design movements / biomimicry. |

Products and Designers

- Enjoy looking at different products and designs.
- Can say whether they like a product/design or not.
- Identify materials used to make a product (e.g. plastic, metal, wood)

- Enjoy looking at different products and designs.
- Can say whether they like a product/design or not.
- Make a link between their work and a product.
- Start to ask their own questions about a product or design.

- Continue to develop their knowledge of key designers and products.
- Can express an opinion about a product, giving simple reasons why.
- Make simple comparisons between designers and products.
- Make links between their work and the work of a designer/maker.
- Discuss when and where a product or design was created
- Begin to make links between key events and individuals in design and technology that have helped shape the world.
- Discuss: what products are; who they are for; how they are made and what materials are used.

- Can discuss a range of key designers and products.
- Express an opinion about a product, justifying reasons.
- Make links between their work and the work of others, noting specific influences and techniques.
- Explore: how well products have been designed and made; why materials have been chosen; what methods of construction have been used; how well products achieve their purpose.

Development of Upper KS2 criteria plus in depth study of the following:

- Analyse similar products for; function, target audience, aesthetics, style, material, cost and size considerations / ingredients and methods used.
- The work of past and present designers,
- Design influences themes -design movements / biomimicry.