

Whitley Memorial CE Primary School
Design Technology Skills Progression



| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Food | <p>Designing smoothie carton packaging by-hand or on ICT software.</p> <p>Chopping fruit and vegetables safely to make a smoothie.</p> <p>Identifying if a food is a fruit or a vegetable.</p> <p>Learning where and how fruits and vegetables grow.</p> <p>Tasting and evaluating different food combinations.</p> <p>Describing appearance, smell and taste.</p> <p>Suggesting information to be included on packaging.</p> | <p>Designing a healthy wrap based on a food combination which works well together.</p> <p>Slicing food safely using the bridge or claw grip.</p> <p>Constructing a wrap that meets a design brief.</p> <p>Describing the taste, texture and smell of fruit and vegetables.</p> <p>Taste testing food combinations and final products.</p> <p>Describing the information that should be included on a label.</p> <p>Evaluating which grip was most effective.</p> | <p>Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.</p> <p>Knowing how to prepare themselves and a workspace to cook safely in, learning the basic rules to avoid food contamination.</p> <p>Following the instructions within a recipe.</p> <p>Establishing and using design criteria to help test and review dishes.</p> <p>Describing the benefits of seasonal fruits and vegetables and the impact on the environment.</p> <p>Suggesting points for improvement when making a seasonal tart.</p> | <p>Designing a biscuit within a given budget, drawing upon previous taste testing.</p> <p>Following a baking recipe.</p> <p>Cooking safely, following basic hygiene rules.</p> <p>Adapting a recipe.</p> <p>Evaluating a recipe, considering: taste, smell, texture and appearance.</p> <p>Describing the impact of the budget on the selection of ingredients.</p> <p>Evaluating and comparing a range of products.</p> <p>Suggesting modifications</p> | <p>Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients.</p> <p>Writing an amended method for a recipe to incorporate the relevant changes to ingredients.</p> <p>Designing appealing packaging to reflect a recipe.</p> <p>Cutting and preparing recipes safely.</p> <p>Using equipment safely, including knives, hot pans and hobs.</p> <p>Knowing how to avoid cross-contamination</p> <p>Following a step-by-step method carefully to make a recipe.</p> <p>Identifying the nutritional differences between different products and recipes.</p> <p>Identifying and describing healthy benefits of food groups.</p> | <p>Writing a recipe, explaining the key steps, method and ingredients.</p> <p>Including facts and drawings from research undertaken.</p> <p>Following a recipe, including using the correct quantities of each ingredient.</p> <p>Adapting a recipe based on research.</p> <p>Working to a given timescale.</p> <p>Working safely and hygienically with independence.</p> <p>Evaluating a recipe, considering: taste, smell, texture and origin of the food group.</p> <p>Taste testing and scoring final products.</p> <p>Suggesting and writing up points of improvements in productions.</p> <p>Evaluating health and safety in production to minimise cross contamination.</p> |
| Mechanism | <p>Explaining how to adapt mechanisms, using bridges or guides to control the movement.</p> <p>Designing a moving story book for a given audience.</p> <p>Following a design to create moving</p> | <p>Selecting a suitable linkage system to produce the desired motions.</p> <p>Designing a wheel.</p> <p>Selecting appropriate materials based on their properties.</p> <p>Selecting materials according to their</p> | <p>Designing a toy that uses a pneumatic system.</p> <p>Developing design criteria from a design brief.</p> <p>Generating ideas using thumbnail sketches and exploded diagrams.</p> <p>Learning that different types of drawings are used in design to explain ideas clearly.</p> | <p>Designing a shape that reduces air resistance.</p> <p>Drawing a net to create a structure from.</p> <p>Choosing shapes that increase or decrease speed as a result of air resistance.</p> <p>Personalising a design.</p> <p>Measuring, marking, cutting and assembling with increasing accuracy.</p> | <p>Designing a pop-up book which uses a mixture of structures and mechanisms.</p> <p>Naming each mechanism, input and output accurately.</p> <p>Storyboarding ideas for a book.</p> <p>Following a design brief to make a pop up book, neatly and with focus on accuracy.</p> <p>Making mechanisms and/or</p> | <p>Experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement.</p> <p>Understanding how linkages change the direction of a force.</p> <p>Making things move at the same time.</p> <p>Understanding and drawing</p> |

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| | <p>models that use levers and sliders. Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed. Reviewing the success of a product by testing it with its intended audience. Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move. Creating clearly labelled drawings that illustrate movement. Adapting mechanisms. Testing mechanisms, identifying what stops wheels from turning, knowing that a wheel needs an axle in order to move.</p> | <p>characteristics. Following a design brief. Evaluating different designs. Testing and adapting a design. Creating a design criteria for a moving monster as a class. Designing a moving monster for a specific audience in accordance with a design criteria. Making linkages using card for levers and split pins for pivots. Experimenting with linkages adjusting the widths, lengths and thicknesses of card used. Cutting and assembling components neatly. Evaluating own designs against design criteria. Using peer feedback to modify a final design.</p> | <p>Creating a pneumatic system to create a desired motion. Building secure housing for a pneumatic system. Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy. Selecting materials due to their functional and aesthetic characteristics. Manipulating materials to create different effects by cutting, creasing, folding and weaving. Using the views of others to improve designs. Testing and modifying the outcome, suggesting improvements. Understanding the purpose of exploded-diagrams through the eyes of a designer and their client.</p> | <p>Making a model based on a chosen design. Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.</p> | <p>structures using sliders, pivots and folds to produce movement. Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result. Evaluating the work of others and receiving feedback on own work. Suggesting points for improvement</p> | <p>cross-sectional diagrams to show the inner-workings of my design. Measuring, marking and checking the accuracy of the jelutong and dowel pieces required. Measuring, marking and cutting components accurately using a ruler and scissors. Assembling components accurately to make a stable frame. Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles. Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set. Evaluating the work of others and receiving feedback on own work. Applying points of improvement to their toys. Describing changes they would make/do if they were to do the project again.</p> |
| Structures | <p>Learning the importance of a clear design criteria. Including individual preferences and requirements in a</p> | <p>Generating and communicating ideas using sketching and modelling. Learning about different types of structures, found in</p> | <p>Designing a castle with key features to appeal to a specific person/purpose. Drawing and labelling a castle design using 2D shapes. Designing and/or decorating a castle tower</p> | <p>Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect. Building frame structures designed to support weight. Creating a range of different</p> | <p>Designing a stable structure that is able to support weight. Creating a frame structure with focus on triangulation. Making a range of different shaped beam bridges. Using triangles to create truss bridges that span a given</p> | <p>Designing a playground featuring a variety of different structures, giving consideration to how the structures will be used. Considering effective and ineffective designs. Building a range of play</p> |

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| | <p>design. Making stable structures from card, tape and glue. Learning how to turn 2D nets into 3D structures. Following instructions to cut and assemble the supporting structure of a windmill. Making functioning turbines and axles which are assembled into a main supporting structure.</p> | <p>the natural world and in everyday objects. Making a structure according to design criteria. Creating joints and structures from paper/card and tape. Building a strong and stiff structure by folding paper. Exploring the features of structures. Comparing the stability of different shapes. Testing the strength of their own structures. Identifying the weakest part of a structure. Evaluating the strength, stiffness and stability of their own structure.</p> | <p>on CAD software. Constructing a range of 3D geometric shapes using nets. Creating special features for individual designs. Making facades from a range of recycled materials. Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design. Suggesting points for modification of the individual designs</p> | <p>shaped frame structures. Making a variety of free-standing frame structures of different shapes and sizes. Selecting appropriate materials to build a strong structure and for the cladding. Reinforcing corners to strengthen a structure. Creating a design in accordance with a plan. Learning to create different textural effects with materials.</p> | <p>distance and support a load. Building a wooden bridge structure. Independently measuring and marking wood accurately. Selecting appropriate tools and equipment for particular tasks. Using the correct techniques to saw safely. Identifying where a structure needs reinforcement and using card corners for support. Explaining why selecting appropriate materials is an important part of the design process. Understanding basic wood functional properties. Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary. Suggesting points for improvements for own bridges and those designed by others.</p> | <p>apparatus structures drawing upon new and prior knowledge of structures. Measuring, making and cutting wood to create a range of structures. Improving a design plan based on peer evaluation. Testing and adapting a design to improve it as it is developed. Identify what makes a successful structure.</p> |
| Textiles | <p>Using a template to create a design for a puppet. Cutting fabric neatly with scissors. Using joining methods to decorate a puppet. Sequencing steps for construction. Reflecting on a finished product, explaining likes and</p> | <p>Designing a pouch. Selecting and cutting fabrics for sewing. Decorating a pouch using fabric glue or running stitch. Threading a needle. Sewing running stitch, with evenly spaced, neat, even stitches to join fabric.</p> | <p>Designing and making a template from an existing cushion and applying individual design criteria. Following design criteria to create a cushion. Selecting and cutting fabrics with ease using fabric scissors. Threading needles with greater independence. Tying knots with greater independence. Sewing cross stitch to join</p> | <p>Writing design criteria for a product, articulating decisions made. Designing a personalised book sleeve. Making and testing a paper template with accuracy and in keeping with the design criteria. Measuring, marking and cutting fabric using a paper template. Selecting a stitch style to join fabric.</p> | <p>Designing a stuffed toy considering the main component shapes required and creating an appropriate template. Considering the proportions of individual components. Creating a 3D stuffed toy from a 2D design. Measuring, marking and cutting fabric accurately and independently. Creating strong and secure blanket stitches when joining</p> | <p>Designing a waistcoat in accordance with a specification and design criteria to fit a specific theme. Annotating designs. Using a template when pinning panels onto fabric. Marking and cutting fabric accurately, in accordance with a design. Sewing a strong running stitch, making small, neat stitches and following the edge.</p> |

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| | dislikes. | <p>Neatly pinning and cutting fabric using a template.</p> <p>Evaluating the quality of the stitching on others' work.</p> <p>Discussing as a class, the success of their stitching against the success criteria.</p> <p>Identifying aspects of their peers' work that they particularly like and why.</p> | <p>fabric.</p> <p>Decorating fabric using appliqué</p> <p>Completing design ideas with stuffing and sewing the edges.</p> <p>Evaluating an end product and thinking of other ways in which to create similar items.</p> | <p>Sewing neatly using small regular stitches.</p> <p>Incorporating a fastening to a design.</p> <p>Testing and evaluating an end product against the original design criteria.</p> | <p>fabric.</p> <p>Threading needles independently.</p> <p>Using appliqué to attach pieces of fabric decoration.</p> <p>Sewing blanket stitch to join fabric.</p> <p>Applying blanket stitch so the spaces between the stitches are even and regular.</p> <p>Testing and evaluating an end product and giving points for further improvements.</p> | <p>Tying strong knots.</p> <p>Decorating a waistcoat – attaching objects using thread and adding a secure fastening.</p> <p>Learning different decorative stitches.</p> <p>Sewing accurately with even regularity of stitches.</p> <p>Evaluating work continually as it is created</p> |
| Digital world | | | <p>Problem solving by suggesting potential features on a Micro:bit and justifying my ideas.</p> <p>Developing design ideas for a technology pouch.</p> <p>Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge.</p> <p>Using a template when cutting and assembling the pouch.</p> <p>Following a list of design requirements.</p> <p>Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch.</p> <p>Applying functional features such as using foam to create soft buttons.</p> <p>Analysing and evaluating an existing product.</p> <p>Identifying the key features</p> | <p>Exploring different mindfulness strategies and using this research to inform my design criteria.</p> <p>Developing a prototype case for my mindful moment timer.</p> <p>Using and manipulating shapes and clipart and using computer-aided design (CAD) to produce a logo.</p> <p>Following a list of design requirements.</p> <p>Developing a prototype case for my mindful moment timer.</p> <p>Creating a 3D structure using a net.</p> <p>Programming a Micro:bit to time a set number of seconds/minutes upon button press.</p> <p>Analysing a range of timers by comparing their advantages and disadvantages.</p> <p>Evaluating my Micro:bit program against points on my design criteria and amending them to include any changes I</p> | <p>Researching (books, internet) for a particular animal's needs.</p> <p>Developing design criteria based on research.</p> <p>Generating multiple housing ideas using building bricks.</p> <p>Understanding what a virtual model is and the pros and cons of traditional and CAD modelling.</p> <p>Placing and manoeuvring 3D objects, using CAD.</p> <p>Changing the properties of, or combining one or more, 3D objects using CAD.</p> <p>Understanding the functional and aesthetic properties of plastics.</p> <p>Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature moves out of a specified range.</p> <p>Stating an event or fact from the last 100 years of plastic history.</p> | <p>Writing a design brief from information submitted by a client.</p> <p>Developing design criteria to fulfil the client's request.</p> <p>Developing a product idea through annotated sketches.</p> <p>Placing and manoeuvring 3D objects, using CAD.</p> <p>Changing the properties of, or combine one or more 3D objects, using CAD.</p> <p>Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo).</p> <p>Explaining material choices and why they were chosen as part of a product concept.</p> <p>Programming an N,E, S,W cardinal compass.</p> <p>Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool.</p> |

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| | | | <p>of a pouch.</p> | <p>made. Documenting and evaluating my project. Understanding what logos are and why they are important in the world of design and business. Testing my program for bugs (errors in the code). Finding and fixing the bugs (debug) in my code.</p> | <p>Explaining how plastic is affecting planet Earth and suggesting ways to make more sustainable choices. Explaining key functions in my program (audible alert, visuals). Explaining how my product's programmed features would be useful for an animal carer.</p> | <p>Developing an awareness of sustainable design. Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch. Demonstrating a functional program as part of a product concept.</p> |
| Electrical System | | | <p>Carrying out research based on a given topic (e.g. The Romans) to develop a range of initial ideas. Generating a final design for the electric poster with consideration for the client's needs and design criteria. Planning the positioning of the bulb (circuit component) and its purpose. Mounting the poster onto corrugated card to improve its strength and withstand the weight of the circuit on the rear. Measuring and marking materials out using a template or ruler. Fitting an electrical component (bulb). Learning ways to give the final product a higher quality finish (e.g. framing to conceal a roughly cut edge). Learning to give and accept constructive criticism on own work and the work of others. Testing the success of initial ideas against the</p> | <p>Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas. Making a torch with a working electrical circuit and switch. Using appropriate equipment to cut and attach materials. Assembling a torch according to the design and success criteria. Evaluating electrical products. Testing and evaluating the success of a final product.</p> | <p>Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product. Developing design criteria based on findings from investigating existing products. Developing design criteria that clarifies the target user. Altering a product's form and function by tinkering with its configuration. Making a functional series circuit, incorporating a motor. Constructing a product with consideration for the design criteria. Breaking down the construction process into steps so that others can make the product. Carrying out a product analysis to look at the purpose of a product along with its strengths and weaknesses. Determining which parts of a product affect its function and which parts affect its form. Analysing whether changes in configuration positively or negatively affect an existing</p> | <p>Designing a steady hand game, identifying and naming the components required. Drawing a design from three different perspectives. Generating ideas through sketching and discussion. Modelling ideas through prototypes. Understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'. Constructing a stable base for a game. Accurately cutting, folding and assembling a net. Decorating the base of the game to a high-quality finish. Making and testing a circuit. Incorporating a circuit into a base. Testing their own and others' finished games, identifying what went well and making suggestions for improvement. Gathering images and information about existing children's toys. Analysing a selection of existing children's toys.</p> |

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| | | <p>design criteria and justifying opinions. Revisiting the requirements of the client to review developing design ideas and check that they fulfil their needs.</p> | | <p>product. Peer evaluating a set of instructions to build a product.</p> | |
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