Mary Tavy and Brentor Primary School

Progression in Design and Technology

Design

	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Structures	• Learn the importance of a clear design criteria • Include individual preferences and requirements of a design. • Generating and communicating ideas using sketching and modelling • Learning about different types of structures , found in the natural world and everyday objects.	• Design a model with key features to appeal to a specific person/purpose. • Drawing and labeling a design using 2d and 3d shapes • Designing a stable structure that is aesthetically pleasing and selecting materials to create a desired effect. • Building framed structures designed to support weight.	• Designing a stable structure that is designed to support weight. • Creating a framed structure with a focus on triangulation • Designing playground or similar featuring a variety of different structures giving careful consideration to how the structures will be used, considering effective and ineffective design.
Mechanisms	• Explaining how to adapt mechanisms using bridges or guides to control the movement • Designing a moving book for a given audience • Designing a vehicle that includes wheels axles, axle holders which will allow the wheels to move • Creating clearly labelled drawings which illustrates movement. • Creating a class design criteria for a moving object • Design a moving object for a specific audience in accordance with a design criteria • Select a suitable linkage system to produce the desired motions • Design a wheel • Select appropriate materials based on their properties	• Designing a toy using a pneumatic system • Developing design criteria from a design brief • Generating ideas using thumbnail sketches and exploded diagrams • Learning that different types of drawings are used in design to explain ideas clearly • Designing a shape that reduces air resistance • Drawing a net to create a structure form • Choosing a shape that increase or decrease speed as a result of air resistance • Personalising a design	• Designing a pop up book which uses a mixture of structures and mechanisms • Naming each mechanism input and output accurately • Storyboarding ideas for a book • After experimenting with a range of cams creating a design for an automata toy based on a choice of cam to create a desired movement • Understand how linkages change the direction of a force • Make things move at the same time.
Electrical Systems	○	• Design a game that works using static electricity including the instructions for playing the game • Identifying a design criteria and a target audience • Designing a lamp giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.	• Creating a labelled design showing positive and negative parts in relation to the LED and the battery, • 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

Cooking and Nutrition	• Designing a healthy wrap based on a food combination which would work well together	• Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture smell and appearance of the dish. • Designing a biscuit within a given budget upon previous taste testing	• Adapting a traditional recipe understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients • Writing an amended recipe to incorporate the relevant changes to ingredients • Designing appealing packaging to reflect a recipe. • Writing a recipe explaining the key steps, method and ingredient.
Textiles	• Use a template to create a design for a puppet	• Designing and making a template from an existing cushion and applying individual design criteria • Writing design criteria for a product articulating decisions made	• Considering proportions of individual components • Designing a waistcoat in accordance with specification linked to a set of design criteria to fir a specific theme. • Annotating designs.

Make			
	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Structures	• Make stable structures from card,tape and glue • Following structures to and assemble the supporting structures of a windmill • Make functional turbines and axles which are assembled into a main supporting structure • Make a structure according to design criteria • Create structures and joints from paper card and tape.	• Constructing a range of geometric shapes using nets • Creating special features for individual designs • Making facades from a range of recycled materials • Creating a range of different shaped structures of different sizes • Selecting appropriate materials to build a strong structure for the cladding • Reinforce corners to strengthen a structure • Create a design in accordance with a plan • Learning to create different textual effects with materials	• Building a range of play apparatus structures drawing upon new and prior knowledge of structures • Measuring, marking and cutting wood to create a range of structures Use a range of materials to reinforce and add decoration to structures.
Mechanism	• Following a design to create moving models that uses levers and sliders. • Cutting and assembling components neatly • Selecting materials according to their characteristics • Following a design brief	• 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 an appealing toy. • Select materials due to their functional and aesthetic characteristics • Manipulating materials to create different effects by cutting, creasing, folding, weaving. • Ensuring, marking cutting and assembling with increasing accuracy • Make a model on a chosen theme	• 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.
Electrical Systems	○	• Make a lamp with a working electrical circuit and a switch • Use appropriate materials to cut and attach materials • Assembling the lamp according to the design and success criteria	• +Making electromagnetic motors and tweaking the motor to improve its function • Constructing a stable base for an electromagnetic game. • Assembling, cutting and folding a net • Decorating the base of the game to a high quality finish • Making a testing a circuit • Incorporating a circuit into a base.
Cooking and Nutrition	• Cutting fruit and vegetables safely to make a smoothie • Identifying if a food is a fruit or a vegetable • Learning where and how fruit and vegetables grow • Slicing food safely using the bridge or claw grip • Constructing a wrap that meets a design brief	• Knowing how to prepare themselves an a workspace to cook safely in, learning the basic rules to avoid food contamination • Following the instructions within a recipe • Following a baking recipe • Cooking safely following basic hygiene rules • Adapting a recipe	• Cutting and preparing vegetables safely • Using equipment safely, including knives, hot pans and hobs • Knowing how to avoid cross-contamination • Following a step by step method carefully to make a recipe • Following a recipe including using the correct quantities of each ingredient • Adapting a recipe based on research

			• Working to a given timescale • Working safely and hygienically with independence
Textiles	• Cutting fabric neatly with scissors • Using joining methods to create a puppet • Sequencing steps for construction • Selecting and cutting fabrics for sewing	• Following a design criteria t create a cushion • Selecting and cutting fabric with ease using fabric scissors • Sewing cross stitch to join fabric • Decorating fabric using applique • Completing design ideas with stuffing and sewing the edges	• Using template pinning panels onto fabric • Making and cutting fabric accurately in accordance with a design • Sewing a strong running stitch making small neat stitches and following the edge • Tying strong knots • Decorating a waistcoat, attaching objects, using thread and adding a secure fastening.

Evaluation			
	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Structures	• Evaluating a windmill according to the design criteria, testing whether the design is strong and stable and altering it if it isn't • Exploring the features of structures • Comparing the stability of different shapes • Suggest points for improvement	• Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design • Suggest points of modification from the original design	• Improving a design plan based on peer evaluation • Testing and adapting a design to improve as it is developed • Identifying what makes a successful structure
Mechanisms	• 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 • Testing mechanisms, identifying what stops wheels from turning • Know that a wheel needs an axle to turn • Testing and adapting a design	• Using the views of others to improve designs • Testing and modifying the outcome, suggesting improvements	• Evaluating the work of others and receiving feedback on own work • Suggesting points for improvement • Applying points of improvement • Describing changes they would make if they were to do the project again.
Electrical Systems	○	• Learning to give constructive feedback on own work and the work of others • Evaluating electrical products • Testing the success of a product against the original design criteria and justifying opinions	• Evaluating a completed product against the original design sheet and looking at modifications that could be made to improve the reliability or aesthetics of it or to incorporate another type of electronic device or buzzer. • Testing own and others finished games, identifying what went well and making suggestions for improvement
Cooking and Nutrition	• Tasting and evaluating different food combinations • Describing appearance, smell, texture • Suggesting information to be in a package • Describing the taste, smell and texture of fruit and vegetables • Tate testing food combinations and final products • Describing the information that should be on label.	• Establishing and using design criteria to help test and review dishes • Describing the benefits of seasonal fruits and vegetables and the impact on the environment. • Suggesting points for improvement l when making a seasonal tart. • Evaluating a recipe considering taste, texture, smell and appearance, • Describing the impact of the budget on the selection of ingredients • Evaluating and comparing a range of products • Suggesting modifications	• Identifying the nutritional differences between different products and recipes • Identifying and describing healthy benefits of food groups • Evaluating a recipe, considering taste , smell, texture and origin of the food group. • Taste testing and scoring final products • Suggesting and writing up points of improvement in productions • Evaluating health and safety in production to minimise cross contamination.
Textiles	• Reflecting on a finished product explaining likes and dislikes. • Evaluating the quality of others; work • Identifying aspects of their peers work the particularly like and why	• Evaluating a product and thinking of other ways to create similar items • Testing and evaluating an end product against the original design criteria and how successful it was • Suggesting modifications for improvement	• Testing and evaluating a product and giving points for further improvement • Evaluating work continually as it is created .

Technical knowledge			
Key Stage 1		Lower Key Stage 2	Upper Key Stage 2
Structures	• Describing the purposes of structures • Learning how to turn 2D nets into 3d structures • Learning that the shape of materials can be changed to improve the strength and stiffness of structures • Understanding that cylinders are a strong type of structure and are often used for windmills or light houses • Understanding that windmill turbines use wind to turn and make the machines inside work • Understand thar axles are used in structures to make parts turn in circles • Develop an awareness of different structures for different purposes	• Building on prior knowledge of net structures and broadening knowledge of frame structures • Implementing frame and shell structure knowledge • Considering effective and ineffective designs	• Knowing that structures can be strengthened by manipulating materials and shapes • Identifying the shell structure in everyday life (cars, aeroplanes, tin cans • Understanding man-made and natural structures.
Vocabulary	*Client design, evaluation, net, stable, strong, test, weak, windmill*	*Aesthetic, cladding, design criteria, evaluation, frame structure, function, stable structure, target audience, texture, theme,*	*Adapt, apparatus, bench, hook, cladding,, coping saw, design, dowel, evaluation, feedback, idea, jelutong, landscape, mark out, measure, modify, natural materials, plan, view, playgrounds, protype, reinforce, sketch, strong, structure, tenon, saw, texture, saw, texture,, saw, texture, user, vice, weak,*
Mechanisms	• Learn that levers and sliders are mechanisms and can make things move • Identifying whether a mechanism is a mover or a slider and determining what movement the mechanism will make • Using the vocabulary, up, down, left, right, vertical and horizontal to describe movement. • Identify what mechanism makes a toy or a vehicle roll forward • Learning that for a wheel to move it must be attached to an axle • Learning that a lever is something that turns into a pivot • Learning that a linkage is a system of levers that are connected by pivots. • Exploring wheel mechanisms# • Exploring how axels help wheels to move a vehicle.	• Understand how pneumatic systems work • Learning that mechanisms are a systems of parts that work together to create motion • Understand that pneumatic systems can be part of a mechanism. • Learning that pneumatic systems force air over a distance to create movement	• Use a bench hook to saw safely and effectivelu • Exploring cams, learning that different shaped cams produce different follower movements • Exploring types of motions and direction of a motion.

Vocabulary	*Assemble, design, evaluation, mechanism, model, sliders, stencil, target audience, template test. Axle axle holder, chassis, design, evaluation, fix, ,mechanic, mechanism, model, text, wheel,*	*Exploded diagram, function, input lever, linkage, mechanism, motion, net, output, pivot, pneumatic system, thumbnail sketch.*	*Aesthetic. Computer aided design, caption, design brief, design criteria,, exploded diagram, function, input linkage,, mechanism, motion, output, pivot protype slider, structure, template.*
Electrical Systems	○	• Learning how electrical products work • Identifying electrical products • Learning what electrical conductors and insulators are • Understanding that a battery contains stored electricity and can be used to power products. • Identifying the features of a torch • Understanding how a torch works • Articulating the positives and negatives about different torches different lamps and torches	• Understanding how electromagnets work • Learning that batteries contain acid, which can be dangerous if they leak • Learning that when electricity enters a magnetic field it can make a motor.
Vocabulary	○	*Battery, bulb, buzzer, cell, component, conductor, ,copper, design criteria, electrical item, electricity, function, insulator, series circuit, switch, test, lamp, wire.*	*Assemble ,battery, battery pack, bulb, bulb holder, buzzer, circuit, circuit symbol,, component, conductor, copper, design, design criteria, evaluation, function, insulator, LED, magnetic field, net, perspective drawing, plan, pliers, prototype, series circuit, side view, steady hand, game, switch, symmetrical, target audience, test, top view, wire cutters.*
Cooking and Nutrition	• Understanding the difference between fruits and vegetables • Describing fruits by texture and taste • Understanding what makes a balanced diet • Know where to find the nutritional information on packaging • Knowing the five food groups	• Learning that climate affects food growth • Working with cooking equipment safely and hygienically • Learning that imported foods travel from far away and this can negatively impact upon the environment • Learning that vegetables and fruit grow in certain seasons • Learning that each fruit and vegetable gives us nutritional benefit • Learning to use store and clean a knife safely. • Understanding the importance of cost and importance of budgeting while planning ingredients for biscuits • Understanding the environment impact on future product and the cost of production. •	• Understanding where food comes from- learning that beef is from cattle and how beef is reared and processed • Understand what constitutes a balanced diet. • Learning to adapt a recipe to make it heailhier • Comparing two adapted recipes using a nutritional calculator and then identifying healthier option • Learning how to research a recipe by ingredient • Record the relevant ingredients and equipment needed for a new recipe. • Understand the combinations of food that will complement one another • Understanding where food comes from, describing the process of 'Farm to Fork' for a given ingredient.
Vocabulary	*Blender,carton,fruit,healthy,ingredients,peel,peeler,recipe,slice,smoothie,stencil, template, vegetable Alternative diet, balanced diet, expensive, healthy ingredients, nutrients, packaging, refrigerator, sugar, substitute*	*Climate, dry climate, exported, imported, Mediterranean, climate, nationality, nutrients, polar climate, recipe, seasonal food, seasons, temperate climate, tropical climate, adapt, budget,, equipment, flavour ingredients, method, net, packaging, prototype, quantity, recipe, target audience, unit of measurement, utilities.*	*Accompaniment, adjective, caption, collaboration, cookbook, cross-contamination, equipment, farm, flavour, illustration, imperative,, verb, ingredients, method, nationality, preparation, processed, reared, recipe, research, storyboard, target audience, top-tips, unit of measurement .*
Textiles	• Learning different ways in which to join fabrics together, pinning, stapling gluing	• Threading needles with greater independence • Tying knots with greater independence • Sewing cross stitch and applique • Understand the need to count the thread on a piece	• Leaning different decorative stitches • Application and outcome od the individual technique • Sewing accurately with even regularity of stitches.

		of each weave fabric in each direction to create uniform, size an appearance • Understand that fabrics can be layered for effect.	
Vocabulary	*Decorate, design, fabric ,glue ,model,, hand puppet, safety pin, staples, stencil, template*	*Accurate, applique, cross-stitch, cushion, decorate, detail, fabric, patch, running stitch, seam, stencil, stuffing, target audience, target customer, template.*	*Accurate,adapt,annotate,,design,design,criteria,detail,fabric,,fastennig, knot, properties, running stitch, seam,, sew, shape, target, audience, target customer, template, thread, unique, waistcoat, waterproof,*