Be the Best Designer

Lewannick Community Primary School

Design & Technology Curriculum Overview

	Structures	Mechanisms/Mechanical Systems	Electrical Systems (KS2)	Cooking and Nutrition	Textiles	Digital World (KS2)
EYFS	Junk Modelling Boats			Soup	Bookmarks	
Owls	Constructing a Windmill Baby Bear's Chair	Fairground Wheel Making a Moving Monster Wheels and Axis		Fruits and Vegetables A Balanced Diet	Puppets	
Otters	Constructing a Castle Pavilions	Making a Slingshot Car	Torches	Eating Seasonally Adapting a Recipe	Egyptian Collars	Electronic Charms
Kestrel	Playgrounds	Making a Pop Up Book	Doodlers Steady Hand Game	What could be healthier? Come dine with me	Waistcoats	Navigating the World

Cycle A

	Foxes	Owls	Otters	Kestrel
Autumn Term	Junk Modelling	Making a Moving Monster	Pavilions	Playgrounds
Spring Term	Book Marks	Puppets	Egyptian Collars	Waistcoats
Summer Term	Boats	Constructing a Windmill	Torches	Doodlers
Cooking Day	Soup	A Balanced Diet	Eating Seasonally	Come Dine with Me!

Cycle B

	Foxes	Owls	Otters	Kestrel
Autumn Term	Junk Modelling	Baby Bear's Chair	Making a Slingshot Car	Steady Hand Game
Spring Term	Book Marks	Fairground Wheel	Constructing a Castle	Making a Pop up Book
Summer Term	Boats	Wheels and Axis	Electronic Charms	Navigating the World
Cooking Day	Soup	Fruits and Vegetables	Adapting a Recipe	What could be healthier?

Be the Best Designer

Cycle A | Owls Class | Y1&2

Lewannick Community Primary School

	Autumn Some Like it Hot, Some Like it Cold!		Spring What a Wonderful World!		Summer Grow Great.	
Area of Learning	Making a Moving Monster		Puppets		Constructing a Windmill	
Skills:	Design	▪ Creating a class design criteria for a moving animal ▪ Designing a moving animal for a specific audience in accordance with a design criteria	Design	▪ Using a template to create a design for a puppet	Design	▪ Learning the importance of a clear design criteria. ▪ Including individual preferences and requirements in a design.
	Make	▪ 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	Make	▪ Cutting fabric neatly with scissors ▪ Using joining methods to decorate a puppet ▪ Sequencing steps for construction	Make	▪ 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.
	Evaluate	▪ Evaluating own designs against design criteria ▪ Using peer feedback to modify a final design	Evaluate	▪ Reflecting on a finished product, explaining likes and dislikes	Evaluate	▪ Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't ▪ Suggest points for improvements
Knowledge	Technical	▪ To know that mechanisms are a collection of moving parts that work together as a machine to produce movement ▪ To know that there is always an input and output in a mechanism ▪ To know that an input is the energy that is used to start something working ▪ To know that an output is the movement that happens as a result of the input ▪ To know that a lever is something that turns on a pivot ▪ To know that a linkage mechanism is made up of a series of levers	Technical	▪ To know that 'joining technique' means connecting two pieces of material together ▪ To know that there are various temporary methods of joining fabric by using staples. glue or pins ▪ To understand that different techniques for joining materials can be used for different purposes ▪ To understand that a template (or fabric pattern) is used to cut out the same shape multiple times ▪ To know that drawing a design idea is useful to see how an idea will look	Technical	▪ To understand that the shape of materials can be changed to improve the strength and stiffness of structures. ▪ To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses). ▪ To understand that axles are used in structures and mechanisms to make parts turn in a circle. ▪ To begin to understand that different structures are used for different purposes. ▪ To know that a structure is something that has been made and put together
	Additional	▪ To know some real-life objects that contain mechanisms	Additional		Additional	▪ To know that a client is the person I am designing for. ▪ To know that design criteria is a list of points to ensure the product meets the clients needs and wants. ▪ To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity. ▪ To know that windmill turbines use wind to turn and make the machines inside work. ▪ To know that a windmill is a structure with sails that are moved by the wind. ▪ To know the three main parts of a windmill are the turbine, axle and structure.
Vocabulary	Evaluation, Input, Lever, Linear motion Linkage, Mechanical, Mechanism Motion, Oscillating motion, Output, Pivot, Reciprocating motion, Rotary motion, Survey		evaluation, input, lever, linear motion, linkage, mechanical, mechanism, motion, oscillating motion, output, pivot, reciprocating motion, rotary motion, survey		client, design, evaluation, net. stable, strong ,test, weak, windmill	

Be the Best Designer

Cycle B | Owls Class | Y1&2

Lewannick Community Primary School

		Autumn		Spring		Summer	
Area of Learning		Baby Bear's Chair		Fairground Wheels		Wheels and Axis	
Skills:	Design	▪ Generating and communicating ideas using sketching and modelling ▪ Learning about different types of structures, found in the natural world and in everyday objects	Design	▪ Selecting a suitable linkage system to produce the desired motion. ▪ Designing a wheel.	Design	▪ Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move ▪ Creating clearly labelled drawings which illustrate movement
	Make	▪ 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	Make	▪ Selecting materials according to their characteristics. ▪ Following a design brief.	Make	▪ Adapting mechanisms
	Evaluate	▪ Exploring the features of structures ▪ Comparing the stability of different shapes ▪ Testing the strength of own structures ▪ Identifying the weakest part of a structure ▪ Evaluating the strength, stiffness and stability of own structure	Evaluate	▪ Evaluating different designs. ▪ Testing and adapting a design.	Evaluate	▪ Testing mechanisms, identifying what stops wheels from turning, knowing that a wheel needs an axle in order to move
Knowledge	Technical	▪ To know that shapes and structures with wide, flat bases or legs are the most stable ▪ To understand that the shape of a structure affects its strength ▪ To know that materials can be manipulated to improve strength and stiffness ▪ To know that a structure is something which has been formed or made from parts ▪ To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move ▪ To know that a 'strong' structure is one which does not break easily ▪ To know that a 'stiff' structure or material is one which does not bend easily	Technical	▪ To know that different materials have different properties and are therefore suitable for different uses.	Technical	▪ To know that wheels need to be round to rotate and move ▪ To understand that for a wheel to move it must be attached to a rotating axle ▪ To know that an axle moves within an axle holder which is fixed to the vehicle or toy ▪ To know that the frame of a vehicle (chassis) needs to be balanced
	Additional	▪ To know that natural structures are those found in nature ▪ To know that man-made structures are those made by people	Additional	▪ To know the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder. ▪ To know that it is important to test my design as I go along so that I can solve any problems that may occur.	Additional	▪ To know some real-life items that use wheels such as wheelbarrows, hamster wheels and vehicles
Vocabulary		function, man-made, mould, natural, stable, stiff, strong, structure, test, weak		Axle , Decorate , Evaluation , Ferris wheel , Mechanism , Stable , Strong , Test , Waterproof , Weak		axle, axle holder, chassis, design, evaluation, fix, mechanic, mechanism, model, test, wheel	

Be the Best Designer

Cycle A | Otter Class | 3&4

Lewannick Community Primary School

	Autumn Rumble in the Jungle		Spring I want my Mummy!		Summer Light it Up!	
Area of Learning	**Pavilions**		**Egyptian Collars**		**Torches**	
Skills:	Design	▪ Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect ▪ Building frame structures designed to support weight	Design	▪ Designing and making a template from an existing cushion and applying individual design criteria	Design	▪ Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas
	Make	▪ Creating a range of different 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	Make	▪ 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 fabric ▪ Decorating fabric using appliqué ▪ Completing design ideas with stuffing and sewing the edges	Make	▪ 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
	Evaluate	▪ Evaluating structures made by the class ▪ Describing what characteristics of a design and construction made it the most effective ▪ Considering effective and ineffective designs	Evaluate	▪ Evaluating an end product and thinking of other ways in which to create similar items	Evaluate	▪ Evaluating electrical products ▪ Testing and evaluating the success of a final product and taking inspiration from the work
Knowledge	Technical	▪ To understand what a frame structure is ▪ To know that a 'free-standing' structure is one which can stand on its own	Technical	▪ To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric ▪ To know that when two edges of fabric have been joined together it is called a seam ▪ To know that it is important to leave space on the fabric for the seam ▪ To understand that some products are turned inside out after sewing so the stitching is hidden	Technical	▪ To understand that electrical conductors are materials which electricity can pass through ▪ To understand that electrical insulators are materials which electricity cannot pass through ▪ To know that a battery contains stored electricity that can be used to power products ▪ To know that an electrical circuit must be complete for electricity to flow ▪ To know that a switch can be used to complete and break an electrical circuit
	Additional	▪ To know that a pavilions is a decorative building or structure for leisure activities ▪ To know that cladding can be applied to structures for different effects. ▪ To know that aesthetics are how a product looks ▪ To know that a product's function means its purpose ▪ To understand that the target audience means the person or group of people a product is designed for ▪ To know that architects consider light, shadow and patterns when designing	Additional		Additional	▪ To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens ▪ To know facts from the history and invention of the electric light bulb(s) – by Sir Joseph Swan and Thomas Edison
Vocabulary	aesthetic, cladding, design criteria, evaluation, frame structure, function inspiration, pavilion, reinforce, stable, structure, target, audience, target customer, texture		accurate, applique, cross-stitch, cushion, decorate, detail, fabric, patch, running-stitch, seam, stencil, stuffing, target audience, target customer, template		battery, bulb, buzzer, cell, component, conductor, copper, design, criteria, electrical item, electricity, function, insulator, series circuit, switch, test, torch ,wire	

Be the Best Designer

Cycle B | Otter Class | Y3&4

Lewannick Community Primary School

		Autumn	Spring		Summer	
Area of Learning		Making a Slingshot Car	Constructing a Castle		Electronic Charms	
Skills:	Design	▪ Designing a shape that reduces air resistance. ▪ Drawing a net to create a structure from. ▪ Choosing shapes that increase or decrease speed as a result of air resistance. ▪ Personalising a design.	Design	▪ Designing a castle with key features to appeal to a specific person/purpose ▪ Drawing and labelling a castle design using 2D shapes, labelling: –the 3D shapes that will create the features – materials needed and colours ▪ Designing and/or decorating a castle tower on CAD software	Design	▪ Problem solving by suggesting potential features on a Micro: bit and justifying my ideas. ▪ Developing design ideas for a technology pouch. ▪ Drawing and manipulating 2D shapes, using computer–aided design, to produce a point of sale badge.
	Make	▪ Measuring, marking, cutting and assembling with increasing accuracy. ▪ Making a model based on a chosen design.	Make	▪ Constructing a range of 3D geometric shapes using nets ▪ Creating special features for individual designs ▪ Making facades from a range of recycled materials	Make	▪ Using a template when cutting and assembling the pouch. ▪ Following a list of design requirements. ▪ Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch. Applying functional features such as using foam to create soft buttons. ▪ Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm.
	Evaluate	▪ Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.	Evaluate	▪ 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	Evaluate	▪ Analysing and evaluating an existing product. ▪ Identifying the key features of a pouch.
Knowledge	Technical	▪ To understand that all moving things have kinetic energy. ▪ To understand that kinetic energy is the energy that something (object/person) has by being in motion. ▪ To know that air resistance is the level of drag on an object as it is forced through the air. ▪ To understand that the shape of a moving object will affect how it moves due to air resistance.	Technical	▪ To understand that wide and flat based objects are more stable ▪ To understand the importance of strength and stiffness in structures	Technical	▪ To understand that, in programming, a 'loop' is code that repeats something again and again until stopped. ▪ To know that a Micro:bit is a pocket–sized, codeable computer.
	Additional	▪ To understand that products change and evolve over time. • To know that aesthetics means how an object or product looks in design and technology. ▪ To know that a template is a stencil you can use to help you draw the same shape accurately. ▪ To know that a birds–eye view means a view from a high angle (as if a bird in flight). ▪ To know that graphics are images which are designed to explain or advertise something. ▪ To know that it is important to assess and evaluate design ideas and models against a list of design criteria.	Additional	▪ To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse – and their purpose ▪ To know that a façade is the front of a structure ▪ To understand that a castle needed to be strong and stable to withstand enemy attack ▪ To know that a paper net is a flat 2D shape that can become a 3D shape once assembled ▪ To know that a design specification is a list of success criteria for a product	Additional	▪ To know what the 'Digital Revolution' is and features of some of the products that have evolved as a result. ▪ To know that in Design and technology the term 'smart' means a programmed product. ▪ To know the difference between analogue and digital technologies. ▪ To understand what is meant by 'point of sale display.' ▪ To know that CAD stands for 'Computer–aided design'.
Vocabulary		Aesthetic, Air resistance, Chassis, Design, Design criteria, Function, Graphics, Kinetic energy, Mechanism, Net, Structure	2D shapes, 3D shapes, Castle, design criteria, Evaluate, Façade, Feature, Flag, Net, Recyclable, Scoring, Stable, Strong, Structure Tab, Weak		Analogue, Badge, CAD, Control, Design requirements, Develop, Digital, Digital revolution, Digital world, Display, Electronic, Electronic products, Fasten, Feature, Function, Initiate, Layers, Loops, Micro: bit Electrical systems: Electric poster, Battery, Bulb, Circuit, Circuit component, Crocodile wires, Program	

Be the Best Designer

Cycle A | Kestrel Class | 5&6

Lewannick Community Primary School

	Autumn		Spring		Summer	
Area of Learning	Playgrounds		Waistcoats		Doodlers	
Skills:	Design	▪ Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs.	Design	▪ Designing a waistcoat in accordance to specification linked to set of design criteria to fit a specific theme ▪ Annotating designs	Design	▪ 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.
	Make	▪ 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. ▪ Using a range of materials to reinforce and add decoration to structures.	Make	▪ 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 ▪ Tying strong knots ▪ Decorating a waistcoat –attaching objects using thread and adding a secure fastening ▪ Learning different decorative stitches ▪ Sewing accurately with even regularity of stitches	Make	▪ 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.
	Evaluate	▪ Improving a design plan based on peer evaluation. ▪ Testing and adapting a design to improve it as it is developed. Identifying what makes a successful structure.	Evaluate	▪ Evaluating work continually as it is created	Evaluate	▪ Carry 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 product. ▪ Peer evaluating a set of instructions to build a product.
Knowledge	Technical	▪ To know that structures can be strengthened by manipulating materials and shapes.	Technical	▪ To understand that it is important to design clothing with the client/ target customer in mind ▪ To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric ▪ To understand the importance of consistently sized stitches	Technical	▪ To know that series circuits only have one direction for the electricity to flow. ▪ To know when there is a break in a series circuit, all components turn off. ▪ To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin. ▪ To know a motorised product is one which uses a motor to function.
	Additional	▪ To understand what a 'footprint plan' is. ▪ To understand that in the real world, design , can impact users in positive and negative ways. ▪ To know that a prototype is a cheap model to test a design idea.	Additional		Additional	▪ To know that product analysis is critiquing the strengths and weaknesses of a product. ▪ To know that 'configuration' means how the parts of a product are arranged.
Vocabulary	adapt, apparatus, bench hook, cladding, coping saw, design, dowel, evaluation, feedback, idea, jelutong, landscape, mark out, measure, modify, natural materials, plan view, playground, prototype, reinforce, sketch, strong, structure, tenon saw, texture, user, vice, weak		accurate, adapt, annotate, design, design criteria, detail, fabric, fastening, knot, properties, running–stitch, seam, sew shape, target audience, target customer, template, thread, unique, waistcoat		circuit component, configuration, current, develop, diy, investigate, motor, motorised, problem solve, product analysis, series circuit, stable, target user	

Be the Best Designer

Cycle B | Kestrel Class | Y5&6

Lewannick Community Primary School

	Autumn		Spring		Summer	
Area of Learning	Steady Hand Game		Pop Up Book		Navigating the World	
Skills:	Design	▪ 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	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.	Design	▪ Writing a design brief from information submitted by a client. ▪ Developing design criteria to fulfil the client's request. ▪ Considering and suggesting additional functions for my navigation tool. ▪ Developing a product idea through annotated sketches. ▪ Placing and manoeuvring 3D objects, using CAD. ▪ Changing the properties of, or combining one or more 3D objects, using CAD.
	Make	▪ 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	Make	▪ Following a design brief to make a pop up book, neatly and with focus on accuracy. ▪ Making mechanisms and/or 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.	Make	▪ Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo). ▪ Explaining material choices and why they were chosen as part of a product concept. ▪ Programming an N,E, S, W cardinal compass.
	Evaluate	▪ Testing 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	Evaluate	▪ Evaluating the work of others and receiving feedback on own work. ▪ Suggesting points for improvement.	Evaluate	▪ Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool. ▪ Developing an awareness of sustainable design. ▪ Identifying key industries that utilise 3D CAD modelling and explaining why. ▪ Describing how the product concept fits the client's request and how it will benefit the customers. ▪ Explaining the key functions in my program, including any additions. ▪ Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool. ▪ 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 pitch.
Knowledge	Technical	▪ To know that batteries contain acid, which can be dangerous if they leak ▪ To know the names of the components in a basic series circuit including a buzzer	Technical	▪ To know that mechanisms control movement. ▪ To understand that mechanisms can be used to change one kind of motion into another. ▪ To understand how to use sliders, pivots and folds to create paper-based mechanisms.	Technical	▪ To know that accelerometers can detect movement. ▪ To understand that sensors can be useful in products as they mean the product can function without human input.
	Additional	▪ To know that 'form' means the shape and appearance of an object ▪ To know the difference between 'form' and 'function' ▪ To understand that 'fit for purpose' means that a product works how it should and is easy to use ▪ To know that form over purpose means that a product looks good but does not work very well To know the importance of 'form follows function' when designing: the product must be designed primarily with the function in mind ▪ To understand the diagram perspectives 'top view', 'side view' and 'back'	Additional	▪ To know that a design brief is a description of what I am going to design and make. ▪ To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.	Additional	▪ To know that designers write design briefs and develop design criteria to enable them to fulfil a client's request. ▪ To know that 'multifunctional' means an object or product has more than one function. ▪ To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing.
Vocabulary	assemble, battery, battery pack, benefit, bulb, bulb holder, buzzer, circuit, circuit symbol, component, conductor, copper, design, design criteria, evaluation, fine motor skills, fit for purpose, form, function, gross motor skills		aesthetic, computer-aided design (cad), caption, design, design brief, design criteria, exploded-diagram, function, input, linkage, mechanism, motion, output, pivot, prototype, slider, structure, template		3d cad, application (apps), biodegradable, boolean, cardinal compass, client, compass, concept, convince, corrode, duplicate, environmentally friendly, equipment, feature, finite, function, functional, gps tracker, if statement, infinite structures: playgrounds, adapt, apparatus, bench hook, cladding, coping saw, design, dowel, evaluation, feedback, idea, jelutong, landscape, mark out, measure, modify, natural materials, plan view, playground, prototype, reinforce, sketch, strong, structure, tenon saw, texture, user, vice, weak, investment, lightweight, loop, manufacture, materials (wood, metal, plastic etc.), mouldable, navigation, non-recyclable, product lifecycle, product lifespan, program, recyclable, smart, sustainable, sustainable design, unsustainable design, variable, workplane	