**Yew Tree Primary Academy**

**Design and Tech**

**nology Progression of Skills**

Development Matters

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EYFS

Kapow Primary

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Years 1

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| **Nursery 2022-2023** | AUTUMN | SPRING | SUMMER |
| Dependent on transition and baseline information some overlearning of prior age bands might occur. | **Focused Texts** **Autumn 1-** Where’s Spot, Dear Zoo & The Tiger who came to tea**Autumn 2-** Owl Babies, Meg & Mog & Room on the broom | **Focused Texts** **Spring 1-** Elmer, Rainbow Fish & Giraffes can’t dance **Spring 2-** Three Little Pigs, Little Red Riding hood & The Gingerbread Man | **Focused Texts** **Summer 1-** The Hungry Caterpillar, Jaspers Beanstalk & The Giant Turnip**Summer 2-**We’re going on a bear hunt, How to catch a star & Aliens love underpants |
| Expressive arts and design | Focus TeachingDT  | ●Listen with increased attention to sounds. ●Create closed shapes with continuous lines, and begin to use these shapes to represent objects. I can make playdough | ● Remember and sing entire songs●Use drawing to represent ideas like movement or loud noises.I can make a salt dough Christmas decoration  | ●Respond to what they have heard, expressing their thoughts and feelings.●Show different emotions in their drawings and paintings, like happiness, sadness, fear etc. ●Make imaginative and complex ‘small worlds’ with blocks and construction kits, such as a city with different buildings and a park.I can make a 3d Model-Elmer | ●Explore colour and colour-mixing. • Play instruments with increasing control to express their feelings and ideas I can build a bridge and the 3 Little Pig’s house. I can discuss what would make a bridge better  | ●Explore colour and colour-mixing. • Sing the melodic shape (moving melody, such as up and down, down and up) of familiar songs. • Sing the pitch of a tone sung by another person (‘pitch match’). I know where food comes from-Fruit Kebab | ●Draw with increasing complexity and detail, such as representing a face with a circle and including details. I can make junk model space rocket |
| Provision opportunities | • Explore different materials freely, in order to develop their ideas about how to use them and what to make. • Develop their own ideas and then decide which materials to use to express them.• Join different materials and explore different textures. * Making area with different materials for construction and models
* Pattern making resources e.g. sticks, buttons, jewels
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| **Reception 2022-2023** | AUTUMN | SPRING | SUMMER |
| Dependent on transition and baseline information some overlearning of prior age bands might occur. | **Literacy Tree Focused Texts****Autumn 1** – Naughty Bus & Oi Frog**Autumn 2 –** Dinosaurs and all that rubbish & Where the wilds things are | **Literacy Tree Focused Texts****Spring 1 –** I’m Henry Finch & Weirdo**Spring 2 –** Little Red & Super Milly  | **Literacy Tree Focused Texts****Summer 1 –** The Tiny Seed & The extraordinary gardener **Summer 2 –** Look Up & The Night Pirates  |
| Expressive arts and design | Focus Teaching | ●Sing familiar songs; moving melody and singing the pitch of a tone sung by another person (‘pitch match’). ●Respond to what they have heard, expressing their thoughts and feelings.I can create my own house in the Lego/construction area I can create a 3D bus using different materials | ●Listen attentively, move to and talk about music, expressing their feelings and responses.I can make a craft sparkler/firework I can make Christmas decorations  | ●Explore, use and refine a variety of artistic effects to express their ideas and feelings.I can use big and small construction to enhance creativity and imagination  | ●Watch and talk about dance and performance art, expressing their feelings and responses.I can design and create my own superhero cape I can design and make my own superhero puppet  | ●Sing in a group or on their own, increasingly matching the pitch and following the melody I can design and create my own junk model habitat for different animals  | ●Perform songs, rhymes, poems and stories with others and (when appropriate) try to move in time with music.I can make a junk model space buggy I can make a boat out of junk materials and investigate to see if it can float |
| Provision opportunities | * Go Noodle – children create their own during healthy living topic
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|  |  | **Structures** |
|  |  | **Year 1** | **Year 2** |
| **Constructing a windmill** | **Baby bear’s chair** |
| **Skills** | **Design** | * Learning the importance of a clear design criteria
* Including individual preferences and requirements in a design
 | • Generating and communicating ideas using sketching and modelling |
| **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
 | * 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
 |
| **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
 | * Testing the strength of own structures
* Identifying the weakest part of a structure
* Evaluating the strength, stiffness and stability of own structure
 |
| **Knowledge** | **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
 | * 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
 |
| **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
 | N/A |

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|  |  | **Year 3** | **Year 4** |
| **Constructing a castle** | **Pavilions** |
| **Skills** | **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
 | * Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect
* Building frame structures designed to support weight
 |
| **Make** | * Constructing a range of 3D geometric shapes using nets
* Creating special features for individual designs
* Making facades from a range of recycled materials
 | * 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
 |
| **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 | * Evaluating structures made by the class
* Describing what characteristics of a design and construction made it the most effective
* Considering effective and ineffective designs
 |
| **Knowledge** | **Technical** | * To understand that wide and flat based objects are more stable
* To understand the importance of strength and stiffness in structures
 | * To understand what a frame structure is
* To know that a ‘free-standing’ structure is one which can stand on its own
 |
| **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
 | * To know that a pavilions ia 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
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|  |  | **Year 6** |
| **Playgrounds** |
| **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 |
| **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
 |
| **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
 |
| **Knowledge** | **Technical** | • To know that structures can be strengthened by manipulating materials and shapes  |
| **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
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**hanisms / mechanical systems**

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|  |  | **Mechanisms/Mechanical Systems** |
|  |  | **Year 2** |
| **Fairground wheel** | **Making a moving monster** |
| **Skills** | **Design** | * Selecting a suitable linkage system to produce the desired motions
* Designing a wheel Selecting appropriate materials based on their properties
 | * Creating a class design criteria for a moving monster
* Designing a moving monster for a specific audience in accordance with a design criteria
 |
| **Make** | * Selecting materials according to their characteristics
* Following a design brief
 | * 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
 |
| **Evaluate** | * Evaluating different designs
* Testing and adapting a design
 | • Evaluating own designs against design criteria • Using peer feedback to modify a final design  |
| **Knowledge** | **Technical** | • To know that different materials have different properties and are therefore suitable for different uses | * 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
 |
| **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
 | • To know some real-life objects that contain mechanisms  |

**Mechanisms / mechanical systems**

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|  |  | **Year 4** | **Year 5** |
| **Making a slingshot car** | **Pop up book** |
| **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
 | * 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
 |
| **Make** | * Measuring, marking, cutting and assembling with increasing accuracy
* Making a model based on a chosen design
 | * 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
 |
| **Evaluate** | • Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance | N/A |
| **Knowledge** | **Technical** | * 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.
 | * To know that mechanisms control movement
* To understand that mechanisms that 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
 |
| **Additional** | * 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. | • 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 |

**Electrical systems (KS2 only)**

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|  |  | **Year 4** | **Year 5** |
| **Torches** | **Doodlers** |
| **Skills** | **Design** | • Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas | * 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 finding from investigating existing products• Developing design criteria that clarifies the target user
 |
| **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
 | * 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** | • Testing and evaluating the success of a final product and taking inspiration from the w | * 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 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
 | * 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 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
 | * 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
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**Cooking and nutrition**

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|  |  | **Food** |
|  |  | **Year 1** | **Year 3** |
| **Fruit and vegetables** | **Eating seasonally** |
| **Skills** | **Design** | • Designing smoothie carton packaging by-hand or on ICT software | • Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish |
| **Make** | * Chopping fruit and vegetables safely to make a smoothie
* Identifying if a food is a fruit or a vegetable
* Learning where and how fruits and vegetables grow
 | * Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination
* Following the instructions within a recipe
 |
| **Evaluate** | * Tasting and evaluating different food combinations
* Describing appearance, smell and taste
* Suggesting information to be included on packaging
 | * 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 when making a seasonal tart
 |
| **Knowledge** | **Cooking and nutrition** | * Understanding the difference between fruits and vegetables
* To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber)
* To know that a blender is a machine which mixes ingredients together into a smooth liquid
* To know that a fruit has seeds and a vegetable does not
* To know that fruits grow on trees or vines
* To know that vegetables can grow either above or below ground
* To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber)
 | * To know that not all fruits and vegetables can be grown in the UK
* To know that climate affects food growth
* To know that vegetables and fruit grow in certain seasons
* To know that cooking instructions are known as a ‘recipe’
* To know that imported food is food which has been brought into the country
* To know that exported food is food which has been sent to another country.
* To understand that imported foods travel from far away and this can negatively impact the environment
* To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre
* To understand that vitamins, minerals and fibre are important for energy, growth and maintaining health
* To know safety rules for using, storing and cleaning a knife safely
* To know that similar coloured fruits and vegetables often have similar nutritional benefits
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**ing and nutrition**

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|  |  | **Year 5** |
| **What could be healthier?** |
| **Skills** | **Design** | * Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients • Writing an amended method for a recipe to incorporate the relevant changes to ingredients
* Designing appealing packaging to reflect a recipe
 |
| **Make** | * 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
 |
| **Evaluate** | * Identifying the nutritional differences between different products and recipes
* Identifying and describing healthy benefits of food groups
 |
| **Knowledge** | **Cooking and nutrition** | * To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues
* To know that I can adapt a recipe to make it healthier by substituting ingredients
* To know that I can use a nutritional calculator to see how healthy a food option is
* To understand that ‘cross-contamination’ means that bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects
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**extiles**

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|  | **Textiles** |
|  | **Year 1** | **Year 6** |
| **Puppets** | **Waistcoats** |
| **Skills** | **Design** | • Using a template to create a design for a puppet | • Designing a waistcoat in accordance to specification linked to set of design criteria to fit a specific theme • Annotating designs |
| **Make** | * Cutting fabric neatly with scissors
* Using joining methods to decorate a puppet
* Sequencing steps for construction
 | * 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
 |
| **Evaluate** | • Reflecting on a finished product, explaining likes and dislikes  | • Evaluating work continually as it is created  |
| **Knowledge** | * 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
 | * 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
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**Digital world (KS2 only)**

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|  |  | **Digital World** |
|  |  | **Year 3** | **Year 6** |
| **Electronic charm** | **Navigating the world** |
| **Skills** | **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
 | * 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 combine one or more 3D objects, using CAD
 |
| **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
 | * 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** | * Analysing and evaluating an existing product
* Identifying the key features of a pouch
 | * 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 explain 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
 |
| **Knowledge** | **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
* Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm
 | * 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 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
 | * 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
 |