

# Woodthorpe Primary School

## Curriculum

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	Design	Make	Evaluate	Technical Knowledge
<b>Nursery (Seasonal Projects)</b>	Making verbal plans and material choices. • Developing a junk model.	Improving fine motor/scissor skills with a variety of materials. • Joining materials in a variety of ways (temporary and permanent). • Joining different materials together. • Describing their junk model, and how they intend to put it together.	Giving a verbal evaluation of their own and others' junk models with adult support. • Checking to see if their model matches their plan. • Considering what they would do differently if they were to do it again. • Describing their favourite and least favourite part of their model.	To know there are a range to different materials that can be used to make a model and that they are all slightly different. • Making simple suggestions to fix their junk model.
<b>Reception</b>	Designing a junk model boat. • Using knowledge from exploration to inform design  Discussing what a good design needs. • Designing a simple pattern with paper. • Designing a bookmark. • Choosing from available materials	Making a boat that floats and is waterproof, considering material choices  Developing fine motor/cutting skills with scissors. • Exploring fine motor/threading and weaving (under, over technique) with a variety of materials. • Using a prepared needle and wool to practise threading.	Reflecting on a finished product and comparing to their design  Making predictions about, and evaluating different materials to see if they are waterproof.	To know that a design is a way of planning our idea before we start. • To know that threading is putting one material through an object.  Making predictions about, and evaluating existing boats to see which floats best. • Testing their design and reflecting on what could have been done differently.  • Investigating how the shapes and structure of a boat affect the way it moves. To know that 'waterproof' materials are those which do not absorb water.
<b>Year 1</b>	• Learning the importance of a clear design criteria. • Including individual preferences and requirements in a design.  Designing smoothie carton packaging by-hand or on ICT software.  Using a template to create a design for a puppet.	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.  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.  Developing fine motor/cutting skills with scissors. • Exploring fine motor/threading and weaving (under, over technique) with a variety of materials. • Using a prepared needle and wool to practise threading.	Tasting and evaluating different food combinations. • Describing appearance, smell and taste. • Suggesting information to be included on Packaging.  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  Reflecting on a finished product and comparing to their design.	• 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 '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 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.
<b>Year 2</b>	Generating and communicating ideas using sketching and modelling. • Learning about different types of structures, found in the natural world and in everyday objects.  Selecting a suitable linkage system to produce the desired motion. • Designing a wheel.  - Creating a class design criteria for a moving monster. • Designing a moving monster for a specific audience in accordance with a design criteria.	- 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.  -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.	- 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  - Evaluating different designs. • Testing and adapting a design  - Evaluating own designs against design criteria. • Using peer feedback to modify a final design.	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  - 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

<p><b>Year 3</b></p>	<p>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.</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>Problem solving by suggesting which features on a Micro:bit might be useful and justifying my ideas. • Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge. • Developing design ideas through annotated sketches to create a product concept. • Developing design criteria to respond to a design brief.</p>	<p>- 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</p> <p>Constructing a range of 3D geometric shapes using nets. • Creating special features for individual designs. • Making facades from a range of recycled materials.</p> <p>Following a list of design requirements. • Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm</p>	<p>• 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>- 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.</p> <p>- Analysing and evaluating wearable technology. • Using feedback from peers to improve design.</p>	<p>- To understand that wide and flat based objects are more stable. • To understand the importance of strength and stiffness in structures.</p> <p>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.</p> <p>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. • To know that a simulator is able to replicate the functions of an existing piece of technology  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. • To know that a simulator is able to replicate the functions of an existing piece of technology</p>
<p><b>Year 4</b></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.</p> <p>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.</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.</p>	<p>- 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 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>Measuring, marking, cutting and assembling with increasing accuracy. • Making a model based on a chosen design.</p> <p>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.</p>	<p>Evaluating structures made by the class. • Describing what characteristics of a design and construction made it the most effective. • Considering effective and ineffective designs.</p> <p>Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.</p> <p>Evaluating electrical products. • Testing and evaluating the success of a final product.</p>	<p>To understand what a frame structure is. • To know that a 'free-standing' structure is one which can stand on its own.</p> <p>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.</p> <p>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.</p>
<p><b>Year 5</b></p>	<p>- 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.</p> <p>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.</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.</p>	<p>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</p> <p>- 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</p> <p>- 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</p>	<p>- Identifying the nutritional differences between different products and recipes. • Identifying and describing healthy benefits of food groups</p> <p>- Evaluating the work of others and receiving feedback on own work. • Suggesting points for improvement.</p> <p>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.</p>	<p><b>Technical-</b> 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 bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects.</p> <p><b>Technical</b> -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</p> <p><b>Technical-</b> 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.</p>
<p><b>Year 6</b></p>	<p>Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs.</p> <p>Designing a waistcoat in accordance to a specification linked to set of design criteria. • Annotating designs, to explain their decisions</p> <p>- Writing a design brief from information submitted by a client • Developing design criteria to fulfil the client's request</p>	<p>-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.</p> <p>- Using a template when cutting fabric to ensure they achieve the correct shape. • Using pins effectively to secure a template to fabric without creases or bulges. • Marking and cutting fabric accurately, in accordance with their design. • Sewing a strong running stitch, making small, neat stitches and following the edge. • Tying strong knots. • Decorating a waistcoat, attaching features (such as appliqué) using thread. • Finishing the waistcoat with a secure fastening (such as buttons). • Learning different decorative stitches. • Sewing accurately with evenly spaced, neat stitches</p>	<p>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.</p> <p>- Reflecting on their work continually throughout the design, make and evaluate process.</p> <p>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</p>	<p>- To know that structures can be strengthened by manipulating materials and shapes</p> <p>- 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</p> <p>- 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</p>

		<p>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</p>	<p>my navigation tool to the client as part of a product concept pitch • Demonstrating a functional program as part of a product concept</p>	
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