



# Whitley Village School



**Whole School Long-Term Rolling Programme**

**Overview**

## Curriculum Intent Design & Technology

The National Curriculum for Design and Technology states that the subject is “inspiring, rigorous and practical”. Design and Technology aims to allow children to use their imagination and creativity to design and make a range of products within a variety of contexts. Children will build and apply the knowledge and skills needed to design high quality products. They are given the opportunity to understand nutrition and learn how to cook.

At Whitley Village School, we aim to implement this through a variety of teaching methods; Design and Technology lessons, developing skills in Art and Design, and through a cross curricular approach within other subject lessons. Design and Technology requires children to draw on skills within Mathematics, Art, Science and Computing. Children will deepen their understanding and independence within all of these subject areas during their Design and Technology lessons.

Throughout their time at Whitley Village School, children will be encouraged to design and make a variety of products. Lessons will be hands on and engaging, with the children having access to lots of resources and materials. They will be encouraged to think critically in order to evaluate their past prototypes and when testing their current designs. This will allow the children to build upon their artistic skills and become more resourceful.

We want the children at Whitley Village School to develop their imagination, their critical thinking and their understanding of the world around them through their love of Design and Technology.

# Skills Progression

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design	Structures	<ul style="list-style-type: none"> <li>• Learning the importance of a clear design criteria</li> <li>• Including individual preferences and requirements in a design</li> </ul>	Generating and communicating ideas using sketching and modelling <ul style="list-style-type: none"> <li>• Learning about different types of structures, found in the natural world and in everyday objects</li> </ul>	Designing a castle with key features to appeal to a specific person/ purpose <ul style="list-style-type: none"> <li>• Drawing and labelling a castle design using 2D shapes, labelling: - the 3D shapes that will create the features – materials need and colours</li> </ul>	Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect <ul style="list-style-type: none"> <li>• Building frame structures designed to support weight</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a stable structure that is able to support weight</li> <li>• Creating frame structure with focus on triangulation</li> </ul>	Designing a project (E.g Playground) featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs
	Mechanisms	Explaining how to adapt mechanisms, using bridges or guides to control the movement <ul style="list-style-type: none"> <li>• Designing a moving story book for a given audience</li> <li>• Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move</li> <li>• Creating clearly labelled drawings which illustrate movement</li> </ul>	Creating a class design criteria for a moving monster <ul style="list-style-type: none"> <li>• Designing a moving monster for a specific audience in accordance with a design criteria</li> <li>• Selecting a suitable linkage system to produce the desired motions</li> <li>• Designing a wheel</li> <li>• Selecting appropriate materials based on their properties (use existing vocab from science to describe these)</li> </ul>	<ul style="list-style-type: none"> <li>• Designing an object which uses a pneumatic system</li> <li>• Developing design criteria from a design brief</li> <li>• Generating ideas using thumbnail sketches and exploded diagrams</li> <li>• Learning that different types of drawings are used in design to explain ideas clearly</li> </ul>	Designing a shape for your object that reduces air resistance <ul style="list-style-type: none"> <li>• Drawing a net to create a structure from</li> <li>• Choosing shapes that increase or decrease speed as a result of air resistance</li> <li>• Personalising a design</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a popup book which uses a mixture of structures and mechanisms</li> <li>• Naming each mechanism, input and output accurately</li> <li>• Storyboarding ideas for a book</li> </ul>	<ul style="list-style-type: none"> <li>• After experimenting with a range of cams, creating a design for an automated toy based on a choice of cam to create a desired movement</li> <li>• Understanding how linkages change the direction of a force</li> <li>• Making things move at</li> </ul>
Make	Structures	Making stable structures from card, tape and glue <ul style="list-style-type: none"> <li>• Following instructions to cut and assemble the supporting structure of a windmill</li> <li>• Making functioning turbines and axles which are assembled into a main supporting structure</li> </ul>	<ul style="list-style-type: none"> <li>• Making a structure according to design criteria</li> <li>• Creating joints and structures from paper/card and tape</li> </ul>	<ul style="list-style-type: none"> <li>• Making a structure according to design criteria</li> <li>• Creating joints and structures from paper/card and tape</li> </ul>	<ul style="list-style-type: none"> <li>• Creating a range of different shaped frame structures</li> <li>• Making a variety of free standing frame structures of different shapes and sizes</li> <li>• Selecting appropriate materials to build a strong structure and for the cladding</li> <li>• Reinforcing corners to strengthen a structure</li> <li>• Creating a design in accordance with a plan</li> <li>• Learning to create different textural effects with</li> </ul>	Making a range of different shaped beam bridges <ul style="list-style-type: none"> <li>• Using triangles to create truss bridges that span a given distance and supports a load</li> <li>• Building a wooden bridge structure</li> <li>• Independently measuring and marking wood accurately</li> <li>• Selecting appropriate tools and equipment for particular tasks</li> <li>• Using the correct techniques to saws safely</li> <li>• Identifying where a structure needs reinforcement and using card corners</li> </ul>	<ul style="list-style-type: none"> <li>• Building a range of play apparatus structures drawing upon new and prior knowledge of structures</li> <li>• Measuring, marking and cutting wood to create a range of structures</li> <li>• Using a range of materials to reinforce and add decoration to structures</li> </ul>

Evaluation	Mechanisms	<ul style="list-style-type: none"> <li>Following a design to create moving models that use levers and sliders</li> <li>Adapting mechanisms</li> </ul>	<p>Making linkages using card for levers and split pins for pivots</p> <ul style="list-style-type: none"> <li>Experimenting with linkages adjusting the widths, lengths and thicknesses of card used</li> <li>Cutting and assembling components neatly</li> <li>Selecting materials according to their characteristics</li> <li>Following a design brief</li> </ul>	<ul style="list-style-type: none"> <li>Creating a pneumatic system to create a desired motion</li> <li>Building secure housing for a pneumatic system</li> <li>Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy</li> <li>Selecting materials due to their functional and aesthetic characteristics</li> <li>Manipulating materials to create different effects by cutting, creasing, folding, weaving</li> </ul>	<p>Measuring, marking, cutting and assembling with increasing accuracy</p> <ul style="list-style-type: none"> <li>Making a model based on a chosen design</li> </ul>	<ul style="list-style-type: none"> <li>Following a design brief to make a pop up book, neatly and with focus on accuracy</li> <li>Making mechanisms and/ or structures using sliders, pivots and folds to produce movement</li> <li>Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result</li> </ul>	<ul style="list-style-type: none"> <li>Measuring, marking and checking the accuracy of the jelutong and dowel pieces required</li> <li>Measuring, marking and cutting components accurately using a ruler and scissors</li> <li>Assembling components accurately to make a stable frame</li> <li>Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles</li> <li>Selecting appropriate materials based on the materials being joined and the speed at which the glue</li> </ul>
	Electrical Systems	N/A	N/A	<p>Making a light (could be a light house) with a working electrical circuit and switch</p> <ul style="list-style-type: none"> <li>Using appropriate equipment to cut and attach materials</li> <li>Assembling a torch according to the design and success criteria</li> </ul>	<p>Making a working Circuit with given parts</p> <ul style="list-style-type: none"> <li>Mapping out where different components of the circuit will go</li> </ul>	<ul style="list-style-type: none"> <li>Making and testing a circuit for a device from parts selected (selected by child freely)</li> </ul>	<ul style="list-style-type: none"> <li>Making a device with an Electromagnetic motors and tweaking the motor to improve its function</li> </ul>
	Cooking and nutrition	<p>Chopping fruit and vegetables safely to make a smoothie</p> <ul style="list-style-type: none"> <li>Identifying if a food is a fruit or a vegetable</li> <li>Learning where and how fruits and vegetables grow</li> </ul>	<p>Slicing food safely using the bridge or claw grip</p> <ul style="list-style-type: none"> <li>Constructing a wrap that meets a design brief</li> </ul>	<p>Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination</p> <ul style="list-style-type: none"> <li>Following the instructions within a recipe</li> </ul>	<ul style="list-style-type: none"> <li>Following a baking recipe</li> <li>Cooking safely, following basic hygiene rules</li> <li>Adapting a recipe</li> </ul>	<p>Cutting and preparing vegetables safely</p> <ul style="list-style-type: none"> <li>Using equipment safely, including knives, hot pans and hobs</li> <li>Knowing how to avoid cross contamination</li> <li>Following a step by step method carefully to make a recipe.</li> </ul>	<p>Following a recipe, including using the correct quantities of each ingredient</p> <ul style="list-style-type: none"> <li>Adapting a recipe based on research</li> <li>Working to a given timescale</li> <li>Working safely and hygienically with independence</li> </ul>
	Structures	<ul style="list-style-type: none"> <li>Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't</li> <li>Suggest points for improvements</li> </ul>	<ul style="list-style-type: none"> <li>Exploring the features of structures</li> <li>Comparing the stability of different shapes</li> <li>Testing the strength of own structures</li> <li>Identifying the weakest part of a structure</li> <li>Evaluating the strength, stiffness and stability of own structure</li> </ul>	<ul style="list-style-type: none"> <li>Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design</li> <li>Suggesting points for modification of the individual</li> </ul>	<p>Evaluating structures made by the class</p> <ul style="list-style-type: none"> <li>Describing what characteristics of a design and construction made it the most effective</li> <li>Considering effective and ineffective designs</li> </ul>	<p>Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary</p> <ul style="list-style-type: none"> <li>Suggesting points for improvements for own bridges and those designed</li> </ul>	<p>Improving a design plan based on peer evaluation</p> <ul style="list-style-type: none"> <li>Testing and adapting a design to improve it as it is developed</li> <li>Identifying what makes a successful structure</li> </ul>

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	Mechanisms	Explaining how to adapt mechanisms, using bridges or guides to control the movement <ul style="list-style-type: none"> <li>• Designing a moving story book for a given audience</li> <li>• Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move</li> <li>• Creating clearly labelled drawings which illustrate movement</li> </ul>	Creating a class design criteria for a moving monster <ul style="list-style-type: none"> <li>• Designing a moving monster for a specific audience in accordance with a design criteria</li> <li>• Selecting a suitable linkage system to produce the desired motions</li> <li>• Designing a wheel</li> <li>• Selecting appropriate materials based on their properties (use existing vocab from science to describe these)</li> </ul>	<ul style="list-style-type: none"> <li>• Designing an object which uses a pneumatic system</li> <li>• Developing design criteria from a design brief</li> <li>• Generating ideas using thumbnail sketches and exploded diagrams</li> <li>• Learning that different types of drawings are used in design to explain ideas clearly</li> </ul>	Designing a shape for your object that reduces air resistance <ul style="list-style-type: none"> <li>• Drawing a net to create a structure from</li> <li>• Choosing shapes that increase or decrease speed as a result of air resistance</li> <li>• Personalising a design</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a popup book which uses a mixture of structures and mechanisms</li> <li>• Naming each mechanism, input and output accurately</li> <li>• Storyboarding ideas for a book</li> </ul>	<ul style="list-style-type: none"> <li>• After experimenting with a range of cams, creating a design for an automated toy based on a choice of cam to create a desired movement</li> <li>• Understanding how linkages change the direction of a force</li> <li>• Making things move at</li> </ul>
Food		<ul style="list-style-type: none"> <li>• Tasting and evaluating different food combinations</li> <li>• Describing appearance, smell and taste</li> <li>• Suggesting information to be included on packaging</li> </ul>	Describing the taste, texture and smell of fruit and vegetables <ul style="list-style-type: none"> <li>• Taste testing food combinations and final products</li> <li>• Describing the information that should be included on a label</li> <li>• Evaluating which grip was most effective</li> </ul>	Establishing and using design criteria to help test and review dishes <ul style="list-style-type: none"> <li>• Describing the benefits of seasonal fruits and vegetables and the impact on the environment</li> <li>• Suggesting points for improvement when making a seasonal tart</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluating a recipe, considering: taste, smell, texture and appearance</li> <li>• Describing the impact of the budget on the selection of ingredients</li> <li>• Evaluating and comparing a range of products</li> <li>• Suggesting modifications</li> </ul>	Identifying the nutritional Differences between different products and recipes <ul style="list-style-type: none"> <li>• Identifying and describing healthy benefits of food groups</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluating a recipe, considering: taste, smell, texture and origin of the food group</li> <li>• Taste testing and scoring final products</li> <li>• Suggesting and writing up points of improvements in productions</li> <li>• Evaluating health and safety in production to minimise crosscontamination</li> </ul>

# Technical Knowledge Intent

		Year 1	Year 2	Year 3	Year 4	Year5	Year 6
Technical Knowledge	Food	<p>Understanding the difference between fruits and vegetables</p> <ul style="list-style-type: none"> <li>• Describing and grouping fruits by texture and taste</li> </ul>	<p>Understanding what makes a balanced diet</p> <ul style="list-style-type: none"> <li>• Knowing where to find the nutritional information on packaging</li> <li>• Knowing the five food groups</li> </ul>	<p>Learning that climate affects food growth</p> <ul style="list-style-type: none"> <li>• Working with cooking equipment safely and hygienically</li> <li>• Learning that imported foods travel from far away and this can negatively impact the environment</li> <li>• Learning that vegetables and fruit grow in certain seasons</li> <li>• Learning that each fruit and vegetable gives us nutritional benefits</li> <li>• Learning to use, store and clean</li> </ul>	<p>Understanding the impact of the cost and importance of budgeting while planning ingredients for biscuits</p> <ul style="list-style-type: none"> <li>• Understanding the environmental impact on future product and cost</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding where food comes from - learning that beef is from cattle and how beef is reared and processed</li> <li>• Understanding what constitutes a balanced diet</li> <li>• Learning to adapt a recipe to make it healthier</li> <li>• Comparing two adapted recipes using a nutritional calculator and then identifying the healthier option</li> </ul>	<p>Learning how to research a recipe by ingredient</p> <ul style="list-style-type: none"> <li>• Recording the relevant ingredients and equipment needed for a recipe</li> <li>• Understanding the combinations of food that will complement one another</li> <li>• Understanding where food comes from, describing the process of 'Farm to Fork' for common ingredients.</li> </ul>
	Mechanisms	<p>Learning that levers and sliders are mechanisms and can make things move</p> <ul style="list-style-type: none"> <li>• Identifying whether a mechanism</li> <li>• is a lever or slider and determining what movement the mechanism will make</li> <li>• Using the vocabulary: up, down, left, right, vertical and horizontal to describe movement</li> <li>• Identifying what mechanism makes a toy or vehicle roll forwards</li> <li>• Learning that for a wheel to move it must be attached to an axle</li> </ul>	<p>Learning that mechanisms are a collection of moving parts that work together in a machine</p> <ul style="list-style-type: none"> <li>• Learning that there is an input and output in a mechanism</li> <li>• Identifying mechanisms in everyday objects</li> <li>• Learning that a lever is something that turns on a pivot</li> <li>• Learning that a linkage is a system of levers that are connected by pivots</li> <li>• Exploring wheel mechanisms</li> <li>• Learning how axels help wheels to move a vehicle</li> </ul>	<p>Understanding how pneumatic systems work</p> <ul style="list-style-type: none"> <li>• Learning that mechanisms are a system of parts that work together to create motion</li> <li>• Understanding that pneumatic systems can be used as part of a mechanism</li> <li>• Learning that pneumatic systems force air over a distance to create movement</li> </ul>	<p>Learning that products change and evolve over time</p> <ul style="list-style-type: none"> <li>• Learning that all moving things have kinetic energy</li> <li>• Understanding that kinetic energy is the energy that something (object person) has by being in motion</li> </ul>	<p>Knowing that an input is the motion used to start a mechanism</p> <ul style="list-style-type: none"> <li>• Knowing that output is the motion that happens as a result of starting the input</li> <li>• Knowing that mechanisms control movement</li> <li>• Describing mechanisms that can be used to change one kind of motion into</li> </ul>	<ul style="list-style-type: none"> <li>• Using a bench hook to saw safely and effectively</li> <li>• Exploring cams, learning that different shaped cams produce different follower movements</li> <li>• Exploring types of motions and direction of a motion</li> </ul>

	Structures	<ul style="list-style-type: none"> <li>• Describing the purpose of structures, including windmills</li> <li>• Learning how to turn 2D nets into 3D structures</li> <li>• Learning that the shape of materials can be changed to improve the strength and stiffness of structures</li> <li>• Understanding that cylinders are a strong type of structure that are often used for windmills and lighthouses</li> <li>• Understanding that windmill turbines use wind to turn and make the machines inside work</li> <li>• Understanding that axles are used in structures and mechanisms to make parts turn in a circle</li> <li>• Developing awareness of different structures for different purposes</li> </ul>	<ul style="list-style-type: none"> <li>• Identifying natural and man-made structures</li> <li>• Identifying when a structure is more or less stable than another</li> <li>• Knowing that shapes and structures with wide, flat bases or legs are the most stable</li> <li>• Understanding that the shape of a structure affects its strength</li> <li>• Using the vocabulary: strength, stiffness and stability</li> <li>• Knowing that materials can be manipulated to improve strength and stiffness</li> <li>• Building a strong and stiff structure by folding paper</li> </ul>	<ul style="list-style-type: none"> <li>• Identifying features of a castle</li> <li>• Identifying suitable materials to be selected and used for a castle, considering weight, compression, tension</li> <li>• Extending the knowledge of wide and flat based objects are more stable</li> <li>• Understanding the terminology of strut, tie, span, beam</li> <li>• Understanding the difference between frame and shell structure</li> </ul>	<ul style="list-style-type: none"> <li>• Learning what pavilions are and their purpose</li> <li>• Building on prior knowledge of net structures and broadening knowledge of frame structures</li> <li>• Implementing frame and shell structure knowledge</li> <li>• Considering effective and ineffective designs</li> </ul>	<ul style="list-style-type: none"> <li>• Exploring how to create a strong beam</li> <li>• Identifying arch and beam bridges and understanding the terms: compression and tension</li> <li>• Identifying stronger and weaker structures</li> <li>• Finding different ways to reinforce structures</li> <li>• Understanding how triangles can be used to reinforce bridges</li> <li>• Articulating the difference between beam, arch, truss and suspension bridges</li> </ul>	<ul style="list-style-type: none"> <li>• Knowing that structures can be strengthened by manipulating materials and shapes</li> <li>• Identifying the shell structure in everyday life (cars, aeroplanes, tins, cans)</li> <li>• Understanding man-made and natural structures</li> </ul>
	Textiles	<p>Learning different ways in which to join fabrics together: pinning, stapling, gluing</p>	<ul style="list-style-type: none"> <li>• Joining items using fabric glue or stitching</li> <li>• Identifying benefits of these techniques</li> <li>• Threading a needle</li> <li>• Sewing running stitch, with evenly spaced, neat, even stitches to join fabric</li> <li>• Neatly pinning and cutting fabric using a template</li> </ul>	<ul style="list-style-type: none"> <li>• Threading needles with greater independence</li> <li>• Tying knots with greater independence</li> <li>• Sewing cross stitch and appliqué</li> <li>• Understanding the need to count the thread on a piece of even weave fabric in each direction to create uniform size and appearance</li> <li>• Understanding that fabrics can be</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding that there are different types of fastenings and what they are</li> <li>• Articulating the benefits and disadvantages of different fastening types</li> </ul>	<ul style="list-style-type: none"> <li>• Learning to sew blanket stitch to join fabric</li> <li>• Applying blanket stitch so the space between the stitches are even and regular</li> <li>• Threading needles independently</li> </ul>	<p>Learning different decorative stitches</p> <ul style="list-style-type: none"> <li>• Application and outcome of the individual technique</li> <li>• Sewing accurately with even regularity of stitches</li> </ul>

# Year 1

	<b>Autumn Term</b>	<b>Spring Term</b>	<b>Summer Term</b>
<b>Year 1</b>	Structures (KSI) Creating moving pictures.  (Making 'Pop Up' books)	Mechanisms (KSI) Levers, sliders, wheels and axles  Making a vehicle	Nutrition and Cooking - Cooking and Nutrition Fruit and Vegetable Smoothie  Textiles - Puppets

# Year 2/3/4 -Class 2

	<b>Autumn Term</b>	<b>Spring Term</b>	<b>Summer Term</b>
<b>Year 2/3/4</b> <b>Rolling Programme A</b>	Structures - Baby Bear's Chair	<b>Textiles:</b> Fastenings / Cooking and Nutrition – Eating Seasonally	Mechanisms – Moving Monsters

<b>Year 2/3/4</b> <b>Rolling Programme B</b>	Mechanisms - Pneumatic Toys	<b>Structures - Castles</b>	<b>Textiles – Pouches</b> Adapting a Recipe
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<b>Year 2/3/4</b> <b>Rolling Programme C</b>	Structures (KSI & 2) How they can be made stronger and more stable. Incorporating electrical components  (Making Lighthouses)	Mechanisms (KSI & KS2 ) Gears and pulleys	Cooking and Nutrition (KSI&2) A Balanced Diet  Textiles : Cushions
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## Year 4/5/6 -Class 3

	<i>Autumn Term</i>	<i>Spring Term</i>	<i>Summer Term</i>
<b>Year 4/5/6</b>  <b>Rolling Programme A</b>	Structures - Bridges <i>Angles, Shape and measure</i>  Electrical Systems -Electric Greetings Cards	Nutrition and Cooking - What could be healthier?	Textiles – Waistcoats Mechanisms - Pop-up Books
<b>Year 4/5/6</b>  <b>Rolling Programme B</b>	Electrical Systems - Steady Hand Games	Mechanisms - Automata Toys	Cooking and Nutrition (KS2) - Come Dine With Me - Textiles - Stuffed Toys
<b>Year 4/5/6</b>  <b>Rolling Programme c</b>	Cooking and Nutrition (KS2)	Mechanical systems (KS2) Gears, pulleys, cams, levers and linkages	<b>Structures</b> Playgrounds