



Warden House – Whole School DT Overview

Year		Unit 1	Unit 2	Unit 3
1	Skills	<p>Food- Fruit and Vegetables. <i>Making a smoothie.</i></p> <p><u>Design</u></p> <ul style="list-style-type: none"> • Designing smoothie carton packaging by-hand or on ICT software <p><u>Make</u></p> <ul style="list-style-type: none"> • 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. <p><u>Evaluate</u></p> <ul style="list-style-type: none"> • Tasting and evaluating different food combinations. • Describing appearance, smell and taste. • Suggesting information to be included on packaging. 	<p>Structures - <i>Designing a Windmill</i></p> <p><u>Design</u></p> <ul style="list-style-type: none"> • Learning the importance of a clear design criteria • Including individual preferences and requirements in a design <p><u>Make</u></p> <ul style="list-style-type: none"> • 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 	<p>Mechanism – wheels and axels. <i>Vehicles.</i></p> <p><u>Design</u></p> <ul style="list-style-type: none"> • Designing a vehicle that includes wheels, axles and axle holders, that when combined, will allow the wheels to move. • Creating clearly labelled drawings that illustrate movement <p><u>Make</u></p> <ul style="list-style-type: none"> • Adapting mechanisms, when: <ul style="list-style-type: none"> ● they do not work as they should. ● to fit their vehicle design. ● to improve how they work after testing their vehicle. <p><u>Evaluate</u></p> <ul style="list-style-type: none"> • Testing wheel and axle mechanisms, identifying what stops the wheels from turning, and recognising that a wheel needs an axle in order to move.

	<p>Knowledge</p>	<ul style="list-style-type: none"> • 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). 	<p><u>Technical</u></p> <ul style="list-style-type: none"> • 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 <p><u>Additional</u></p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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. • To know some real-life items that use wheels such as wheelbarrows, hamster wheels and vehicles.
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2	Skills	<p>Structures – <i>Baby Bears Chair.</i></p> <p><u>Design</u></p> <ul style="list-style-type: none"> • Generating and communicating ideas using sketching and modelling. • Learning about different types of structures, found in the natural world and in everyday objects. <p><u>Make</u></p> <ul style="list-style-type: none"> • 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. <p><u>Evaluate</u></p> <ul style="list-style-type: none"> • 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. 	<p>Mechanisms – Levers, Linkages and pivots.</p> <p><i>Moving Monsters</i></p> <p><u>Design</u></p> <ul style="list-style-type: none"> • Creating a class design criteria for a moving monster. • Designing a moving monster for a specific audience in accordance with a design criteria. <p><u>Make</u></p> <ul style="list-style-type: none"> • 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 <p><u>Evaluate</u></p> <ul style="list-style-type: none"> • Evaluating own designs against design criteria. • Using peer feedback to modify a final design. 	<p>Textiles - <i>Pouches</i></p> <p><u>Design</u></p> <ul style="list-style-type: none"> • Designing a pouch. <p><u>Make</u></p> <ul style="list-style-type: none"> • Selecting and cutting fabrics for sewing. • Decorating a pouch using fabric glue or running stitch. • Threading a needle. • Sewing running stitch, with evenly spaced, neat, even stitches to join fabric. • Neatly pinning and cutting fabric using a template. <p><u>Evaluate</u></p> <ul style="list-style-type: none"> • Troubleshooting scenarios posed by the teacher. • Evaluating the quality of the stitching on others' work. • Discussing as a class the success of their stitching against the success criteria. • Identifying aspects of their peers' work that they particularly like and explaining why.
	Knowledge	<ul style="list-style-type: none"> • 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 natural structures are those found in nature. • To know that man-made structures are those made by people. 	<ul style="list-style-type: none"> • 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. • To know some real-life objects that contain mechanisms. 	<ul style="list-style-type: none"> • To know that sewing is a method of joining fabric. • To know that different stitches can be used when sewing. • To understand the importance of tying a knot after sewing the final stitch. • To know that a thimble can be used to protect my fingers when sewing.

Food *Eating seasonally.*Design

- Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.

Make

- 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

- 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.

Mechanisms - Pneumatics – *pneumatic toys.*Design

- Designing a toy which uses a pneumatic system.
- Developing design criteria from a design brief.
- Generating ideas using thumbnail sketches and exploded diagrams.
- Learning that different types of drawings are used in design to explain ideas clearly.

Make

- Creating a pneumatic system to create a desired motion.
- Building secure housing for a pneumatic system.
- Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy.
- Selecting materials due to their functional and aesthetic characteristics.
- Manipulating materials to create different effects by cutting, creasing, folding and weaving.

Evaluate

- Using the views of others to improve designs.
- Testing and modifying the outcome, suggesting improvements.
- Understanding the purpose of exploded-diagrams through the eyes of a designer and their client.

Textiles - *Cushions*Design

- Designing and making a template from an existing cushion and applying individual design criteria

Make

- Following design criteria to create a cushion or Egyptian collar.
- 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.

Evaluate

- Evaluating an end product and thinking of other ways in which to create similar items.

	Knowledge	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • To understand how pneumatic systems work. • To understand that pneumatic systems can be used as part of a mechanism. • To know that pneumatic systems operate by drawing in, releasing and compressing air. • To understand how sketches, drawings and diagrams can be used to communicate design ideas. • To know that exploded-diagrams are used to show how different parts of a product fit together. • To know that thumbnail sketches are small drawings to get ideas down on paper quickly. 	<ul style="list-style-type: none"> • To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. • 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.
4	Skills	<p><u>Structures</u> – Pavilions</p> <p><u>Design</u></p> <ul style="list-style-type: none"> • 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><u>Make</u></p> <ul style="list-style-type: none"> • 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. 	<p><u>Mechanisms</u> – Sling Shot Cars</p> <p><u>Design</u></p> <ul style="list-style-type: none"> • 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><u>Make</u></p> <ul style="list-style-type: none"> • Measuring, marking, cutting and assembling with increasing accuracy. • Making a model based on a chosen design. <p><u>Evaluate</u></p> <ul style="list-style-type: none"> • Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance. 	<p><u>Electrical systems</u> - Torches</p> <p><u>Design</u></p> <ul style="list-style-type: none"> • Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas. <p><u>Make</u></p> <ul style="list-style-type: none"> • 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. <p><u>Evaluate</u></p> <ul style="list-style-type: none"> • Evaluating electrical products.

		<ul style="list-style-type: none"> • Learning to create different textural effects with materials. <p><u>Evaluate</u></p> <ul style="list-style-type: none"> • Evaluating structures made by the class. • Describing what characteristics of a design and construction made it the most effective. • Considering effective and ineffective designs. 		<ul style="list-style-type: none"> • Testing and evaluating the success of a final product.
	Knowledge	<ul style="list-style-type: none"> • To understand what a frame structure is. • To know that a 'free-standing' structure is one which can stand on its own. • To know that a pavilion 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 	<ul style="list-style-type: none"> • 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. • 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. 	<ul style="list-style-type: none"> • 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 • 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.

5	Skills	<p>Food -What could be healthier</p> <p><u>Design</u></p> <ul style="list-style-type: none"> 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><u>Make</u></p> <ul style="list-style-type: none"> 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><u>Evaluate</u></p> <ul style="list-style-type: none"> Identifying the nutritional differences between different products and recipes. Identifying and describing healthy benefits of food groups 	<p>Structures – Bridges</p> <p><u>Design</u></p> <ul style="list-style-type: none"> Designing a stable structure that is able to support weight. Creating a frame structure with a focus on triangulation. <p><u>Make</u></p> <ul style="list-style-type: none"> Making a range of different shaped beam bridges. Using triangles to create truss bridges that span a given distance and support a load. Building a wooden bridge structure. Independently measuring and marking wood accurately. Selecting appropriate tools and equipment for particular tasks. Using the correct techniques to saws safely. Identifying where a structure needs reinforcement and using card corners for support. Explaining why selecting appropriating materials is an important part of the design process. Understanding basic wood functional properties <p><u>Evaluate</u></p> <ul style="list-style-type: none"> Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary. Suggesting points for improvements for own bridges and those designed by others. 	<p>Electrical systems- Electrical Greeting Cards</p> <p><u>Design</u></p> <ul style="list-style-type: none"> 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><u>Make</u></p> <ul style="list-style-type: none"> 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><u>Evaluate</u></p> <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> To understand some different ways to reinforce structures. To understand how triangles can be used to reinforce bridges. To know that properties are words that describe the form and function of materials. To understand why material selection is important based on properties. 	<ul style="list-style-type: none"> 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 product analysis is critiquing the strengths and weaknesses of a product. To know that 'configuration' means how the parts of a product are arranged.

		<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • To understand the material (functional and aesthetic) properties of wood. • To understand the difference between arch, beam, truss and suspension bridges. • To understand how to carry and use a saw safely. 	
6	Skills	<p>CAD- Navigating the world <u>Design</u></p> <ul style="list-style-type: none"> • 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. <p><u>Make</u></p> <ul style="list-style-type: none"> • 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><u>Evaluate</u></p> <ul style="list-style-type: none"> • 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. 	<p><u>Mechanisms – Cams – Automated Toys</u> <u>Design</u></p> <ul style="list-style-type: none"> • Experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement. • Understanding how linkages change the direction of a force. • Making things move at the same time. • Understanding and drawing cross-sectional diagrams to show the inner-workings of my design <p><u>Make</u></p> <ul style="list-style-type: none"> • Measuring, marking and checking the accuracy of the jelutong and dowel pieces required. • Measuring, marking and cutting components accurately using a ruler and scissors. • Assembling components accurately to make a stable frame. • Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles. • Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set. <p><u>Evaluate</u></p> <ul style="list-style-type: none"> • Evaluating the work of others and receiving feedback on own work. • Applying points of improvement to their toys. • Describing changes they would make/do if they were to do the project again. 	<p><u>Textiles – Waistcoats</u> <u>Design</u></p> <ul style="list-style-type: none"> • Designing a waistcoat in accordance to a specification linked to set of design criteria. • Annotating designs, to explain their decisions. <p><u>Make</u></p> <ul style="list-style-type: none"> • 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><u>Evaluate</u></p> <ul style="list-style-type: none"> • Reflecting on their work continually throughout the design, make and evaluate process.

		<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 • 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. 	<ul style="list-style-type: none"> • To understand that the mechanism in an automata uses a system of cams, axles and followers. • To understand that different shaped cams produce different outputs. • To know that an automata is a hand powered mechanical toy. • To know that a cross-sectional diagram shows the inner workings of a product. • To understand how to use a bench hook and saw safely. • To know that a set square can be used to help mark 90° angles. 	<ul style="list-style-type: none"> • 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.

Design and technology process

- Diagnose faults in battery operated devices (such as low battery, water damage or battery terminal damage).
- Model design using software
- Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products.
- Create products using leavers, wheels and winding machines.
- Design products, refining, the design as work progress.
- Use software to design.
- Explore objects and designs to identify likes and dislikes of designs.
- Suggest improvements to existing designs.
- Explore how products have been created.