



Hill West Design Technology Curriculum Overview

Year ONE Outcomes

Structures

- Knows the importance of a clear design criteria, including individual preferences and requirements in a design.
- Can follow instructions to cut and assemble the supporting structure of a windmill (including turn 2D nets into 3D structures)
- Can evaluate a product according to the design criteria, and suggest points for improvements.
- Understands that the shape of materials can be changed to improve the strength and stiffness of structures.
- Understands that axles are used in structures and mechanisms to make parts turn in a circle and to begin to understand that different structures are used for different purposes.
- Knows that a structure is something that has been made and put together.

Mechanisms

- Understands that a mechanism is the parts of an object that move together.
- Knows that a slider mechanism moves an object from side to side and that a slider mechanism has a slider, slots, guides and an object.

Textiles

- Knows that a design is a way of planning our idea before we start and identify that threading is putting one material through an object.

Cooking and Nutrition

- Is able to taste test and evaluate different food combinations, describing appearance, smell and taste and make suggestions of information to be included on packaging.

1. Structures: Constructing Windmills

2. Mechanisms: Moving Story Book

3. Mechanisms: Wheels and Axels

4. Textiles: Puppets

5. Textiles: Puppets

6. Cooking and Nutrition: Smoothies and their packaging

Year TWO Outcomes

Structures

- Is able to identify the different types of structures, found in the natural world and in everyday objects.
- Can create joints and structures from paper/card and tape and to build a strong and stiff structure by folding paper.
- Is able to test the strength of own structures and identify the weakest part of a structure and evaluate the strength, stiffness and stability of their own structure.
- Understands that shapes and structures with wide, flat bases or legs are the most stable.

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Mechanisms

- Is able to select a suitable linkage system to produce the desired motion.
- Can create a design criteria for a moving monster and cut/ assemble components neatly.
- Can test and evaluate designs against a design criteria, using peer feedback to modify a final design.
- Understands that different materials have different properties and are therefore suitable for different uses.
- Knows that mechanisms are a collection of moving parts that work together as a machine to produce movement.
- Understands that there is always an input and output in a mechanism and that an input is the energy that is used to start something working.
- Knows that a lever is something that turns on a pivot and that a linkage mechanism is made up of a series of levers

Textiles

- Knows that 'joining technique' means connecting two pieces of material together and that there are various temporary methods of joining fabric by using staples. glue or pins.
- Understands that different stitches can be used when sewing and to understand the importance of tying a knot after sewing the final stitch.

Cooking and Nutrition

- Can design a three-wrap based on food combinations which work well together, and taste test the food combinations and final products
- Understands that 'diet' means the food and drink that a person or animal usually eats, and to understand what makes a balanced diet.
- Knows that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar.
- To know that 'ingredients' means the items in a mixture or recipe.

1. Mechanisms: Fairground Wheel	2. Cooking and Nutrition: Balanced Diet	3. Structures: Baby Bear's Chair
4. Textiles: Pouches	5. Mechanisms: Moving Monster	6. Cooking and Nutrition: Designing and making 3 Wraps

Year THREE Outcomes

Structures

- Can draw and label a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours.
- Can construct a range of 3D geometric shapes using nets, creating special features for individual designs.
- Knows that a paper net is a flat 2D shape that can become a 3D shape once assembled.
- Understands that a design specification is a list of success criteria for a product.

Mechanisms

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- Understands that pneumatic systems operate by drawing in, releasing and compressing air.
- Can design a toy which uses a pneumatic system.
- Can use syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy
- Understands the purpose of exploded-diagrams through the eyes of a designer and their client.
- Can use the views of others to improve designs, and to test and modifying the outcome, suggesting improvements

Textiles

- Understands that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces.
- Understands that when two edges of fabric have been joined together it is called a seam.
- Understand that some products are turned inside out after sewing so the stitching is hidden.

Cooking and Nutrition

- Knows that not all fruits and vegetables can be grown in the UK and to know that vegetables and fruit grow in certain seasons.
- Can follow the instructions within a recipe, selecting seasonal ingredients, through their design.
- Is aware of safety when peeling ingredients safely, and cutting safely with a safety vegetable knife.

1. Textiles: Cross Stitch: (Design and make a cushion or Egyptian collar)	2. Structures: Constructing a Castle	3. Cooking and nutrition: Eating seasonally, Designing a recipe for a Savoury Tart
4. Digital world: Wearable Technology: Design and produce a wearable Badge	5. Mechanical Systems: Pneumatic Toys	6. Electrical Systems: Design an Electric Poster on a given topic (Romans)

Year FOUR Outcomes

Mechanical Systems

- Can design a shape that reduces air resistance and draw a net to create a structure from.
- Can use tools for measuring, marking, cutting and assembling with increasing accuracy.
- Understands that all moving things have kinetic energy, and that kinetic energy is the energy that something (object/person) has by being in motion.
- Knows that air resistance is the level of drag on an object as it is forced through the air and to understand that the shape of a moving object will affect how it moves due to air resistance.

Textiles

- Can write a design criteria for a product, articulating decisions made when designing a personalised book sleeve.
- Can use measuring, marking and cutting techniques when using fabric, using a paper template, selecting a stitch style to join fabric.

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- Can work neatly by sewing small, straight stitches, incorporating a fastening to a design.
- Knows that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro.
- To be able to test and evaluate an end product against the original design criteria, deciding how many of the criteria should be met for the product to be considered successful.
- To suggest modifications for improvement, articulating the advantages and disadvantages of different fastening types.

Structures

- Can design a stable pavilion structure that is aesthetically pleasing and is able to select materials to create a desired effect.
- Understands what a frame structure is, and to know that a 'free-standing' structure is one which can stand on its own.
- Can create a range of different shaped frame structures, making a variety of free-standing frame structures of different shapes and sizes.
- Selects appropriate materials to build a strong structure and cladding, reinforcing corners to strengthen a structure.

Cooking and Nutrition

- Can design a biscuit within a given budget, drawing upon previous taste testing judgements.
- Is able to follow a baking recipe, including the preparation of ingredients.
- Can cook safely, following basic hygiene rules, adapting a recipe to meet the requirements of a target audience.
- Understands that the amount of an ingredient in a recipe is known as the 'quantity'.
- Knows the following cooking techniques: sieving, measuring, stirring, cutting out and shaping.

Electrical Systems

- Can design a torch, considering the target audience and creating both design and success criteria focusing on features of individual design ideas.
- Can make a torch with a working electrical circuit and switch, using appropriate equipment to cut and attach materials.
- Understands that electrical conductors are materials which electricity can pass through and understands that electrical insulators are materials which electricity cannot pass through.
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1. **Mechanical Systems: Making a Slingshot Car**

2. **Textiles: Fastenings: Design a Personalised Book Sleeve**

3. **Structures: Pavilions**

4. **Cooking and nutrition: Adapting a recipe: Designing a Biscuit within a given budget/taste testing**

5. **Electrical Systems: Torches**

6. **Cooking and nutrition: Adapting a recipe: Designing a Biscuit within a given budget/taste testing**



Year FIVE Outcomes

Cooking and Nutrition

- Can adapt a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients.
- Can write an amended method for a recipe to incorporate the relevant changes to ingredients, designing appealing packaging to reflect a recipe, researching existing recipes to inform ingredient choices.
- Can cut and prepare vegetables safely using equipment safely, including knives, hot pans and hobs, knowing how to avoid cross-contamination.
- Is able to follow a step-by-step method carefully to make a recipe.
- Knows that you can use a nutritional calculator to see how healthy a food option is and to identify where nutritional information is found on food packaging.

Electrical Systems

- Carries out research based on a given topic (e.g. The Romans) to develop a range of initial ideas and generate a final design for the electric poster with consideration to the client's needs and design criteria.
- Can measure and mark materials out using a template or ruler and fit an electrical component (bulb).
- Understands that an electrical system is a group of parts (components) that work together to transport electricity around a circuit.
- Understands common features of an electric product (switch, battery or plug, dials, buttons etc.) and list examples of common electric products (kettle, remote control etc.)

Mechanical Systems

- Can design a pop-up book which uses a mixture of structures and mechanisms.

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- Can make 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.
- Knows that mechanisms control movement and understand that mechanisms can be used to change one kind of motion into another.

Digital World

- Understands what a virtual model is and the pros and cons of traditional and Computer Aided Designs (CAD) modelling.
- Understands that a sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose.
- Understands that conditional statements (and, or,) in programming are a set of rules which are followed if certain conditions are met.

Textiles

- Can design a stuffed toy, considering the main component shapes required and creating an appropriate template; measuring, marking and cutting fabric accurately and independently.
- Can creating strong and secure blanket stitches when joining fabric, threading needles independently and using appliqué to attach pieces of fabric decoration.
- Understands that it is easier to finish simpler designs to a high standard and that soft toys are often made by creating appendages separately and then attaching them to the main body.
- Understands that small, neat stitches which are pulled taut are important to ensure that the soft toy is strong and holds the stuffing securely.
- Can test and evaluate an end product and to give points for further improvements.

Structures

- Can make a range of different shaped beam bridges, using triangles to create truss bridges that span a given distance and support a load.
- Is able to build a wooden bridge structure, independently measuring and marking wood accurately, selecting appropriate tools and equipment for particular tasks.
- Can use the correct techniques to saw safely, identifying where a structure needs reinforcement and using card corners for support.
- Can explain why selecting appropriating materials is an important part of the design process and understands the basic wood functional properties.
- Understands the difference between arch, beam, truss and suspension bridges.

1. Cooking and nutrition: Developing and Adapting a Traditional Recipe

2. Electrical Systems: Doodlers
Developing design criteria for existing products

3. Mechanical Systems: Making a Pop-up Book

4. Digital World: Monitoring Devices

5. Structures: Bridges

6. Textiles: Stuffed Toys



Year SIX Outcomes

Cooking and Nutrition

- Can write a recipe, explaining the key steps, method and ingredients including facts and drawings from research undertaken.
- Is able to follow a recipe, including using the correct quantities of each ingredient, adapting a recipe based on research.
- Can work to a given timescale and to work safely and hygienically with independence.
- Understands that many countries have 'national dishes' which are recipes associated with that country.
- Understands that 'processed food' means food that has been put through multiple changes in a factory.
- Understands that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides and to understand what happens to foods before it appears on the supermarket shelf (Farm to Fork).

Electrical Systems

- Can design a steady hand game - identifying and naming the components required. Drawing a design from three different perspectives.
- Understands the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'.
- Can construct a stable base for a game accurately cutting, folding and assembling a net and to decorating the base of the game to a high quality finish.
- Can make and test a circuit, incorporating a circuit into the base; knowing the names of the components in a basic series circuit, including a buzzer.
- Knows that 'form' means the shape and appearance of an object and the difference between 'form' and 'function'.
- Understands that 'fit for purpose' means that a product works how it should and is easy to use.
- To know the importance of 'form follows function' when designing: the product must be designed primarily with the function in mind and understand the diagram perspectives 'top view', 'side view' and 'back'.

Mechanical Systems

- Can experiment with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement.
- Can use measuring, marking and cutting components accurately using a ruler and scissors.

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- Is able to assemble 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.

Digital World

- Can write a design brief from information submitted by a client, developing design criteria to fulfil the client's request.
- Can develop a product idea through annotated sketches, placing and manoeuvring 3D objects, using Computer Aided Design (CAD)

Textiles

- Can design a waistcoat in accordance to a specification linked to set of design criteria, annotating designs, to explain their decisions.
- Can use a template when cutting fabric to ensure the correct shape, in accordance with their design.
- Can use various techniques: sewing a strong running stitch, making small, neat stitches and following the edge, tying strong knots.
- Can decorate the waistcoat, attaching features (such as appliqué) using thread, finishing the waistcoat with a secure fastening (such as buttons).

Structures

- Can design a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs.
- Can build 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.
- Understands 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 and to understand what a 'footprint plan' is.
- To improve a design plan based on peer evaluation.

1. Structures: Playgrounds	2. Mechanical Systems: Automata toys	3. Electrical Systems: Steady Hand Game
4. Textiles: Waistcoats	5. Cooking and nutrition: Creating a Recipe (Come Dine with Me)	6. Digital World: Navigating the World-3D Printing