Willow Tree Academy

DT- Scheme of Work

Key 5 Strands:

Food

Textiles

Construction and materials

Mechanisms

Electronics

EYFS Framework

Expressive Arts and Design

ELG:

- Creating with Materials Children at the expected level of development will: - Safely use and explore a variety of materials, tools and techniques,
- experimenting with colour, design, texture, form and function; - Share their creations,
- explaining the process they have used; - Make use of props and materials when role playing characters in narratives and stories.

National Curriculum Content:

Design and technology programmes of study:

key stages 1 and 2 National curriculum in England

Purpose of study

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

Aims

- The national curriculum for design and technology aims to ensure that all pupils:
- develop the creative, technical and practical expertise needed to perform everyday
- tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design
- and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook.

Key stage 1

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment].

When designing and making, pupils should be taught to:

Design

design purposeful, functional, appealing products for themselves and other users based on design criteria generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology

Make

select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

Evaluate

explore and evaluate a range of existing products evaluate their ideas and products against design criteria

Technical knowledge

build structures, exploring how they can be made stronger, stiffer and more stable explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

Key stage 2

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

When designing and making, pupils should be taught to:

Design

use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make

select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

Evaluate

investigate and analyse a range of existing products evaluate their ideas and products against their own design criteria and consider the views of others to improve their work understand how key events and individuals in design and technology have helped shape the world

Technical knowledge

apply their understanding of how to strengthen, stiffen and reinforce more complex structures understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] apply their understanding of computing to program, monitor and control their products.

Cooking and Nutrition

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

Pupils should be taught to:

Key stage 1

- use the basic principles of a healthy and varied diet to prepare dishes
- understand where food comes from.

Key stage 2

- understand and apply the principles of a healthy and varied diet
- prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques
- understand seasonality, and know where and how a variety of ingredients are grown,reared, caught and processed.

Year group coverage:

	EYFS	Y1/ Y2 (Cycle 1)	Y1/ Y2 (Cycle 2)	Y3/Y4 (Cycle 1)	Y3/Y4 (Cycle 2)	Y5	Y6
Areas of learning to be taught.	Expressive arts and design	Food and Nutrition	Construction and materials	Textiles	Construction and materials	Electronics	Electronics
		Construction and materials	Textiles	Mechanisms	Food Technology	Food Technology	Cooking and nutrition
		Mechanisms	Food and Nutrition	Construction and materials	Electronics	Textiles	Control / Mechanisms (pneumatics)

Knowledge Progression
EYFS- Y6

Design, make, evaluate

EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Make, change or modify things for themselves. Children to make their own decisions when designing. Identify similarities and differences Children to be independent learners - making choices and decisions - use a variety of tools and materials Eg scissors Child friendly knives - cutting own snack. Links to STEM projects - sinking and floating, construction and structures. Growth. In EYFS - DT runs through all areas of learning.	Design products that have a definite function for a particular person (xmas card) Make products to meet basic design brief	Design and make products, modifying the product as the project evolves Bird house model	Produce designs with a clear purpose having explored needs, food packaging Select materials carefully to suit the design and use.	Refine methods and design as work progresses, constantly reassessing design. Use computer packages to design and model products. Construct series and parallel circuits	Design by considering the user, prioritizing good function before profit. Produce several prototypes each building upon the previous to optimise design	Produce a good quality finish to products using art techniques Include design processes such as prototypes, cross-sectional diagrams and CAD

Food

EYFS	Y1	Y2	Y3	Y4	Y5	Y6
	Select from and use ingredients according to their characteristics (Healthy sandwich)	Safely cut, peel or grate ingredients in a hygienic manner (fruit salad) Use measuring cups or electronic scales to measure the required amounts Combine ingredients to produce food.	Use correct utensils to hygienically prepare food Combine and or cook **Cycle 1/ 2**	Use correct utensils to hygienically prepare food Combine and or cook **Cycle 1/ 2**	Understand how to store and handle food ingredients properly. Invent and modify own recipes including ingredients, methods, cooking times and temperatures	Understand how to store and handle food ingredients properly. Invent and modify own recipes including ingredients, methods, cooking times and temperatures.

Textiles

EYFS	Y1	Y2	Y3	Y4	Y5	Y6
	Use a running stitch to join fabric Use methods such as dyeing, adding sequins or printing alter the appearance of fabric Make use of template to produce shapes.		Use correct stitch to join materials felt stocking or angel decor Add decorative finish using a suitable technique		Use a variety of stitching techniques to join fabrics. Understand the purpose of and include a seam allowance.	

Construction and materials

EYFS	Y1	Y2	Y3	Y4	Y5	Y6
	Practice techniques to join and/or strengthen materials eg , gluing and reinforcing card		Select appropriate techniques to construct products		Practice practical skills to a reasonable standard to produce products	

Mechanisms

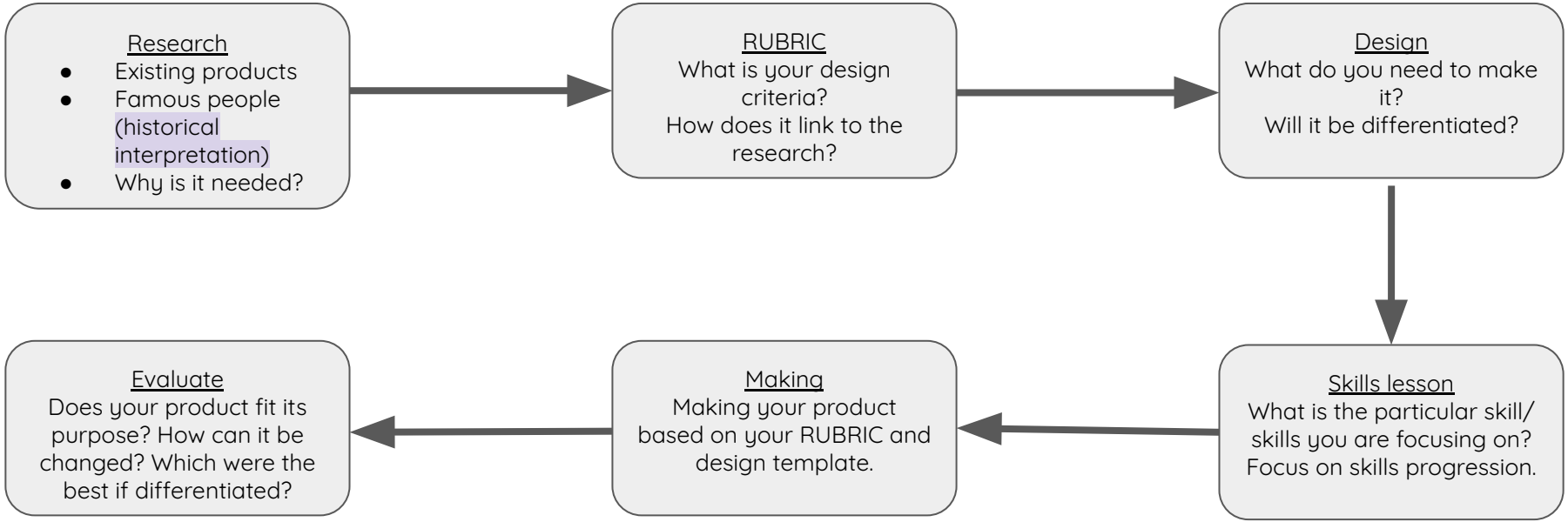
EYFS	Y1	Y2	Y3	Y4	Y5	Y6
To selects tools and techniques needed to shape, assemble and join materials they are using." Moving (T1) Materials (T1) Model (T1) Represent own ideas, thoughts and feelings through design and technology.	To explore and use mechanisms e.g. levers, wheels and axles in their products." • Explain how to adapt mechanisms, using bridges or guides to control the movement • Design a moving story book for a given audience. • Design a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move. • Create clearly labelled drawings which illustrate movement	To explore and use mechanisms e.g. levers, wheels and axles in their products." Tools (T2) Structure (T2) Design (T2) • Create class design criteria for a moving creature. • Design a moving creature for a specific audience in accordance with design criteria • Select a suitable linkage system to produce the desired motions. • Design a wheel. Select appropriate materials based on their properties.	"To understand and use mechanical systems e.g. gears, pulleys and linkages in their products." • Design a product which uses a pneumatic system. • Develop design criteria from a design brief. • Learn that different types of drawings are used in design to explain ideas clearly. Generate ideas using thumbnail sketches and exploded diagrams.	"To understand and use mechanical systems e.g. gears, pulleys and linkages in their products." • Design a shape that reduces air resistance. • Draw a net to create a structure from. • Choose shapes that increase or decrease speed as a result of air resistance. • Personalise a design.	"To understand and use mechanical systems e.g. gears, pulleys and linkages in their products." Design a popup book which uses a mixture of structures and mechanisms. • Name each mechanism, input and output accurately. • Storyboard ideas for a book.	"To understand and use mechanical systems e.g. gears, pulleys and linkages in their products." Evaluate (T2) Axel (T3) Prototype (T3) After experimenting with a range of cams, create a design for an automaton toy based on a choice of cam to create a desired movement. • Understand how linkages change the direction of a force. • Make things move at the same time.

Historical inspiration

EYFS	Y1	Y2	Y3	Y4	Y5	Y6
	Investigate historic designs to find their strengths and weaknesses (houses) Weald and D	Take an existing design and propose improvements plants Explore the processes used to create products planted pot	Know the work of some recognised designers in all areas of study (including pioneers in horticultural techniques to stimulate ideas for designs)	Make improvements to established designs and be able to explain why. Disassemble designs to discover how they work.	Combine designs from several significant designers explaining the selections.	Start with existing designs and invent improved ones Evaluate the design of products and identify possible further changes to improve it performance

Scheme of Work
EYFS- Y6

Design, make and evaluate



Key information:

- One DT project per term
- Skills lesson to focus on a particular skill from the skills progression document
- These do not need to be individual lessons

Rubric

Rubric

		I think I have...	My teacher thinks I have...
Must			
Should			
Could			
Going for Gold - My personal target			
My reflection:			

Things to think about

- How does it link to the purpose of the product?
- Does it challenge the children when producing their product?
- What skills does it promote and how has that skill progressed from previous learning?
- Have they gone back to their initial design when producing their evaluation?

DT Long Term Plan

- Creating with Materials Children at the expected level of development will: - Safely use and explore a variety of materials, tools and techniques,
- experimenting with colour, design, texture, form and function; - Share their creations,
- explaining the process they have used; - Make use of props and materials when role playing characters in narratives and stories.

EYFS

A	B	C
Expressive Arts and Design ● Explore what we can do with different media and what happens when we put different things together ● Developing our drawing skills ● Explore colour and colour mixing ● Painting a self portrait ● Making simple models	**Expressive Arts and Design** ● Explore what we can do with different media and what happens when we put different things together ● Exploring colour and colour mixing ● Links between imaginative play ● Developing our drawing skills	**Expressive Arts and Design** ● Explore what we can do with different media and what happens when we put different things together ● Links between imaginative play and narrative ● Developing our drawing skills ● Evaluating our models and creative learning:identifying strengths and next steps. ● STEM project- making a shield for a knight

DT Long Term Plan

Cycle 1

- Investigate historic designs to find their strengths and weaknesses
- Design products that have a definite function for a particular person
- Make products to meet a basic design brief

Year 1&2

A	B	C
Food and Nutrition • Select from and use ingredients according to their characteristics (e.g. healthy sandwich)	**Textiles** • Use a running stitch to join fabric. • Use methods such as dyeing, adding sequin or printing to alter the appearance of fabric. • Make use of templates to produce shapes.	**Mechanisms** • Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products. (E.g. London Bus)

DT Long Term Plan

Cycle 2

- Design and make products, modifying the product as the project evolves
- Take a existing design and propose improvements
- Explore the processes used to create products

Year 1&2

A	B	C
Materials • Demonstrate safe use of a given tool (e.g. saw) • Perform a range of cutting and shaping techniques (e.g. cutting, folding, curling) • Use a range of joining techniques (e.g. gluing hinges or combining materials to strengthen)	**Construction** • Practice techniques to join an/or strengthen materials, e.g. gluing and reinforcing card. • Demonstrate safe use of a given tool (e.g. saw) E.g. Heraldic Shield, Medieval Goblet	**Cooking & Nutrition** • Use the basic principles of a healthy and varied diet to prepare dishes . • Understand where food comes from (E.g. Healthy eating dishes)

YEAR 1 END OF THE YEAR DT STATEMENTS:

All children should be able to:

- ***Design products that have a definite function for a particular person (Christmas card)***
- ***Make products to meet basic design brief***
- ***Select from and use ingredients according to their characteristics (Healthy sandwich)***
- ***Use a running stitch to join fabric***
- ***Use methods such as dyeing, adding sequins or printing alter the appearance of fabric***
- ***Make use of template to produce shapes.***
- ***Practice techniques to join and/or strengthen materials eg , gluing and reinforcing card***
- ***Investigate historic designs to find their strengths and weaknesses (houses) Weald and D***

YEAR 2 END OF THE YEAR DT STATEMENTS:

All children should be able to:

- ***Design and make products, modifying the product as the project evolves Bird house model***
- ***Safely cut, peel or grate ingredients in a hygienic manner (fruit salad)***
- ***Use measuring cups or electronic scales to measure the required amounts***
- ***combine ingredients to produce food.***
- ***explore and use mechanisms in their products , wheels and axles***
- ***Demonstrate safe use of a given tool. (saw)***
- ***Perform a range of cutting and shaping techniques eg tearing, cutting, folding and curling Bird boxes***
- ***Use a range of joining techniques eg gluing, hinges or combining materials to strengthen.***
- ***Take an existing design and propose improvements plants***
- ***Explore the processes used to create products planted pot***

DT Long Term Plan

- Produce a design with a clear purpose having explored needs and packaging,
- Select materials carefully to suit the intended design and use,
- Know the work of some recognised designers in all areas of study.

Year 3

A	B	C
Mechanisms • Apply understanding of forces to select a suitable mechanism, e.g. levers, winding mechanism, pulleys and gears E.g Farm machine	**Materials** • Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities • Choose and use suitable cutting, shaping and joining techniques.	**Construction** • Apply their understanding of how to strengthen, stiffen and reinforce more complex structures E.g. Bird boxes/animal homes

YEAR 3 END OF THE YEAR DESIGN AND TECHNOLOGY STATEMENTS:

All children should be able to:

- ***Produce designs with a clear purpose having explored needs, food packaging***
- ***Select materials carefully to suit the design and use.***
- ***Use correct stitch to join materials felt stocking or angel deco***
- ***add decorative finish using a suitable technique***
- ***Select appropriate techniques to construct products***
- ***Use correct utensils to hygienically prepare food, combine and or cook***
- ***Know the work of some recognised designers in all areas of study (including pioneers in horticultural techniques to stimulate ideas for designs)***

DT Long Term Plan

- Disassemble designs to discover how they work.
- Make improvements to established designs and be able to explain why.
- Refine methods and design as work progresses.
- Use computer packages to design and model products.

Year 4

A	B	C
Textiles • Use the correct stitch to join materials • Add a decorative finish using suitable techniques	**Food Technology** • Use the correct utensils to hygienically prepare food • Understand where food comes from • Use the basic principles of a healthy and varied diet to prepare dishes.	**Electronics** • Construct series and parallel circuits (note at this stage, pupils DO NOT need to draw circuit diagrams)

YEAR 4 END OF THE YEAR DT STATEMENTS:

All children should be able to:

- ***Refine methods and design as work progresses, constantly reassessing design.***
- ***Use computer packages to design and model products.***
- ***Construct series and parallel circuits***
- ***Apply understanding of forces to select a suitable mechanism eg levers, winding mechanism, pulleys and gears.***
- ***Use suitable cutting and shaping techniques***
- ***Choose suitable joining techniques***
- ***Make improvements to established designs and be able to explain why.***
- ***Disassemble designs to discover how they work.***

DT Long Term Plan

- Combine designs from several different designers explaining the sections,
- Design by considering the user, prioritising good function before profit
- Produce several prototypes each building upon the previous to optimise design

Year 5

A	B	C
Electronics • Create circuits using electronics kits that combine a number of parts (e.g. LEDs, resistors, chips etc.) Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] E.g. moving space buggy	**Cooking and Nutrition** • Design - Make -EvaluateUnderstand an apply the principles of a healthy and varied diet Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques • Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. Understand how to store and handle food ingredients properly. E.g. VE day party	**Textiles** • Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities • Use a variety of stitching techniques to join fabrics. Understand the purpose of and include a seam allowance.

YEAR 5 END OF THE YEAR DT STATEMENTS:

All children should be able to:

- ***Design by considering the user, prioritising good function before profit.***
- ***Produce several prototypes each building upon the previous to optimise design***
- ***Create circuits using electronics kits that combine a number of parts (e.g. LEDs, resistors, chips etc.)***
- ***Practice practical skills to a reasonable standard to produce products***
- ***use a variety of stitching techniques to join fabrics.***
- ***understand the purpose of and include a seam allowance.***
- ***Combine designs from several significant designers explaining the selections.***

DT Long Term Plan

- Produce a good quality finish to products using art techniques.
- Start with existing designs and invent improved ones e.g. adapt methods, ingredients or times in a recipe.
- Include design processes such as prototypes, cross-sectional, diagrams and CAD.
- Evaluate the design of products and identify possible further changes to improve it performance

Year 6

A	B	C
Electronics • Design - Make - Evaluate Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] E.g. Lighthouse Project	**Mechanisms** **(Pneumatics)** • Design - Make -EvaluateUnderstand and use mechanical systems in their products [for example, gears,pulleys, cams, levers and linkages]Combine electronics and mechanisms to produce original designs.e.g. STEM model of circulatory stems.	**Control** • Design - Make - Evaluate Apply their understanding of computing to program, monitor and control their Products. E.g. blackout houses with working electric lights. Sensors to detect light/dark

Food Technology throughout the year →

YEAR 6 END OF THE YEAR DT STATEMENTS:

All children should be able to:

- ***Produce a good quality finish to products using art techniques***
- ***Include design processes such as prototypes, cross-sectional diagrams and CAD***
- ***Understand how to store and handle food ingredients properly.***
- ***Invent and modify own recipes including ingredients, methods, cooking times and temperatures***
- ***Cut with precision and produce a good finish***
- ***Select appropriate tools to cut and shape a particular type of material***
- ***Combine electronics and mechanics to produce original designs***
- ***Use cams to change a rotation into a push/pull movement***
- ***Start with existing designs and invent improved ones***
- ***Evaluate the design of products and identify possible further changes to improve it performance***