



Biscovey Primary Academy Design and Technology Curriculum



The place of Design & Technology in Primary Schools:

'WE ARE CURRENTLY PREPARING STUDENTS FOR JOBS THAT DON'T YET EXIST...USING TECHNOLOGIES THAT HAVEN'T BEEN INVENTED... IN ORDER TO SOLVE PROBLEMS WE DON'T EVEN KNOW ARE PROBLEMS YET.' (the National College)

Design and Technology National Curriculum Requirements

KS1

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.

Cooking and Nutrition

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

KS2

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

- 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.

Biscovey Primary Academy Design and Technology Sequence of Learning

Year 3- Year 6

<u>Year 3 – Autumn 1</u>	<u>Year 3 - Spring 1</u>	<u>Year 3 - Summer 2</u>
<i>Food/ Cooking and Nutrition</i>	<i>Structures</i>	<i>Digital World</i>
Topic: You are what you eat. Skills: Design: To design a healthy wrap based on a food combination that works well together. Make: • Chopping foods safely to make a wrap. • Constructing a wrap that meets a design brief. • Grating foods to make a wrap. • Snipping smaller foods instead of cutting. Evaluate: • Describing the taste, texture and smell of fruit and vegetables. • Taste testing food combinations and final products. • Describing the information that should be included on a label. • Evaluating food by giving a score Knowledge: • Know that 'diet' means the food and drink that a person or animal usually eats. • To understand what makes a balanced diet. • To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar. • To understand that I should eat a range of different foods from each food group, and roughly how much of each food group. - To know that 'ingredients' means the items in a mixture or recipe.	Topic: Tribal Tales Skills: Design: Designing a castle with key features to appeal to a specific person/purpose. Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours. Make: • Constructing a range of 3D geometric shapes using nets. • Creating special features for individual designs. • Making facades from a range of recycled materials. Evaluate: • Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design. • Suggesting points for modification of the individual designs. Knowledge: • To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose. • To know that a façade is the front of a structure. • To understand that a castle needed to be strong and stable to withstand enemy attack. • To know that a paper net is a flat 2D shape that can become a 3D shape once assembled. - To know that a design specification is a list of success criteria for a product.	Topic: Exciting Egyptians Skills: Design: Problem solving by suggesting which features on a Micro:bit might be useful and justifying ideas. Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge. Developing design ideas through annotated sketches to create a product concept. Developing design criteria to respond to a design brief. Make: • Following a list of design requirements. • Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm. Evaluate: • Analysing and evaluating wearable technology. • Using feedback from peers to improve design. Knowledge: • To understand that, in programming, a 'loop' is code that repeats something again and again until stopped. • To know that a Micro:bit is a pocket-sized, codeable computer. • To know that a simulator is able to replicate the functions of an existing piece of technology • To know what the 'Digital Revolution' is and features of some of the products that have evolved as a result. - To know that CAD stands for 'Computer-aided design'
<u>Key skills from KS1</u> ➤ How to select from and use a range of tools and equipment to perform practical tasks: for example, cutting, shaping, joining and finishing. ➤ How to select from and use a wide range of materials and components, including construction materials, textiles and cooking ingredients, according to their characteristics.		
<u>Core Facts</u> - I know that 'diet' means the food and drink that a person or animal usually eats. • I know that the five main food groups are: carbohydrates, fruits and vegetables, protein, dairy and oils and spreads • I know that I should eat a range of different foods from each food group, and know roughly how much of each. ● I know that 'ingredients' means the items in a mixture or recipe.	<u>Core Facts</u> • I know that wide and flat based objects are more stable. • I know how important strength and stiffness is in structures. • I know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse-and their purpose. • I know that a façade is the front of a structure.	<u>Core Facts</u> • I know that, in programming, a 'loop' is code that repeats something again and again until stopped. • I know that a micro-bit is a pocket-sized, codeable computer.

Year 4/5 – Autumn 2	Year 4/5 - Spring 1	Year 4/5 - Summer 1
Food/ Cooking and Nutrition	Structure	Textiles
Topic: Mexico City Skills: Design: To design a biscuit within a given budget, drawing upon previous taste testing judgements. To design packaging for a biscuit that targets a specific group. Make: - Following a baking recipe, including the preparation of ingredients. - Cooking safely, following basic hygiene rules. - Adapting a recipe to meet the requirements of a target audience. - Using a cuboid net to create packaging. Evaluate: - Evaluating a recipe, considering: taste, smell, texture and appearance. - Describing the impact of the budget on the selection of ingredients. - Evaluating and comparing a range of food products. - Suggesting modifications to a recipe (e.g. This biscuit has too many raisins, and it is falling apart, so next time I will use less raisins) Knowledge: - To know that the amount of an ingredient in a recipe is known as the 'quantity.' - To know that safety and hygiene are important when cooking. - To know the following cooking techniques: sieving, measuring, stirring, cutting out and shaping. - To understand the importance of budgeting while planning ingredients for biscuits. - To know that products often have a target audience. -	Topic: Island Invaders- Anglo Saxons Skills: Design: To design a stable structure that is able to support weight. To create a frame structure with a focus on triangulation. Make: - 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. Evaluate: - 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. Knowledge: - 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. - 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.	Topic: Victorians Skills: Design: To design and make a template from an existing cushion and applying individual design criteria. Make: - Following design criteria to create a cushion. - 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: - 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. -
Core Facts - I know that the amount of an ingredient in a recipe is known as the 'quantity'. - I know that the safety and hygiene are important when cooking. - I know how to: sieve, measure, mix/stir, cut-out and shape.	Core Facts - I know how triangles can be used to reinforce bridges. - I know that properties are words that describe the form and function of materials.	Core Facts - I know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. - I know that when two edges of fabric have been joined together it is called a seam.

• I know the importance of budgeting while planning ingredients for a recipe.	• I know why material selection is important based on their properties. • I know the material (functional and aesthetic) properties of wood.	• I know that it is important to leave space on the fabric for the seam. • I know and understand that some products are turned inside out after sewing so the stitching is hidden.
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<u>Year 6 – Autumn 1</u>	<u>Year 6 - Spring 1</u>	<u>Year 6 - Summer 2</u>
<i>Mechanical Systems</i>	<i>Electrical Systems</i>	<i>Food/ Cooking and Nutrition</i>
Topic: Benin Skills: Design: • Designing a pop-up book which uses a mixture of structures and mechanisms. • Naming each mechanism, input and output accurately. • Storyboarding ideas for a book. Make: • Following a design brief to make a pop up book, neatly and with focus on accuracy. • Making mechanisms and/or structures using sliders, pivots and folds to produce movement. • Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result. Evaluate: • Evaluating the work of others and receiving feedback on own work. • Suggesting points for improvement. Knowledge: • To know that mechanisms control movement. • To understand that mechanisms can be used to change one kind of motion into another. • To understand how to use sliders, pivots and folds to create paper-based mechanisms. • To know that a design brief is a description of what I am going to design and make. • To know that designers often want to hide mechanisms to make a product more aesthetically pleasing. -	Topic: Under the Canopy Skills: Design: • 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. Make: • 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. Evaluate: • 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: • To know that series circuits only have one direction for the electricity to flow. • To know when there is a break in a series circuit, all components turn off. • To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin. • To know a motorised product is one which uses a motor to function. • 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. -	Topic: Who am I? Skills: Design: • 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. • Researching existing recipes to inform ingredient choices. Make: • 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. Evaluate: • Identifying the nutritional differences between different products and recipes. • Identifying and describing healthy benefits of food groups. Knowledge: • To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed. • To know that recipes can be adapted to suit nutritional needs and dietary requirements. • To know that I can use a nutritional calculator to see how healthy a food option is. • To understand that 'cross-contamination' means bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects. • To know that coloured chopping boards can prevent cross-contamination. • To know that nutritional information is found on food packaging. - To know that food packaging serves many purposes.

<u>Core Facts</u> • I know that mechanisms control movement. • I know that mechanisms can be used to change one kind of motion into another. • I know how to used sliders, pivots and folds to create paper-based mechanisms. • I know that a design brief is a description of what I am going to design and make.	<u>Core Facts</u> • I know what a series circuit is and that electricity only flows in one direction. • I know when there is a break in a series circuit, all components turn off. • I know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin. • I know a motorised product is one which uses a motor to function.	<u>Core Facts</u> • I know that recipes can be adapted to suit nutritional needs and dietary requirements. • I know that nutritional information is found on food packaging. • I know that coloured chopping boards can prevent cross-contamination. • I know that food packaging serves many purposes.
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