

# DESIGN TECHNOLOGY CURRICULUM MAP

## TWO YEAR ROLLING PROGRAMME

We follow a two-year rolling programme to fit in with our mixed aged classes. DT is taught in discrete sessions, however the products may be linked to an overarching topic or theme. These links help to provide context and purpose for design and technology outcomes. We use KAPOW to support the teaching of t skills. Kapow topics have been matched with our own themes where possible.

Years	2022-2023						2023-2024					
	Autumn		Spring		Summer		Autumn		Spring		Summer	
EYFS	Marvelous Me	Terrific Tales	Ticket to Ride	Amazing Animals	Come Outside !	Commotion in the ocean	One year programme					
	Children in the EYFS have opportunities through the year to learn to:- <ul style="list-style-type: none"><li>- explore the textures, movement, feel and look of different media and materials</li><li>- respond to a range of media and materials developing an understanding that they manipulate and create effects with these</li><li>- use different media and materials to express their own ideas</li><li>- construct with a purpose in mind using a variety of resources</li><li>- develop skills to use simple tools and techniques competently and appropriately</li><li>- select appropriate resources for a product and adapt their work where necessary</li></ul>											
Years 1 and 2	Are you super-human?	What do you know about chocolate ?	Where do you live?	Can you remember?	What can we grow?	Where in the world?	What's it made of?	Who looks after you?	How can we get there?	Knights and castles	What's cooking	Where does it live?
	Making a moving story book: Superhero pop up book  Mechanism (Kapow)	Chocolate apples Nutrition  Pouches (Christmas dec) (Kapow) Textile		Tudor house  Structure		Pirate paddy's lunch  Nutrition / structure	Fabric Faces  Textiles		Wheels and axles  Mechanism (Kapow)	Throne fit for a king (Kapow BB Chair) Structure	Fruits and vegetables  Nutrition (Kapow)	
Years 3 and 4	Super humans	Time traveller – Romans	Extreme Earth	Victorians	Let's grow	Amazing world and animal kingdom	May the force be with you	How ancient are we?	Explorers of the North	Healthy me!	Light and dark	Rocky road
	Adapting a recipe	Electric poster	Volcano	Toys	Mindful moments timer	Fastening	Iron man head Torches	Egyptian collars	Bridges	Eating seasonally	Electronic charm	Making a slingshot car



	Nutrition	Electrical	Structure	Mechanical	Digital	Textiles	Electrical	Textiles	Structure	Nutrition	Digital	Mechanical
Years 5 and 6	Superheroes	Time traveler - WW2	Around the world in 30 days	Vikings	Let's grow	Amazing world: animal kingdom	To infinity and beyond	Eureka! Ancient Greece	The amazing Mayans	What's cooking	That's entertainment	It's all ancient history
		Anderson shelters (structure s-bridges)	Digital world- Navigating the World (K)		Food- what could be healthier? (K)	Textiles: Stuffed toys (K)	Moon buggy automata toys		Structure s- playgrounds (K)	Food: Come dine with me (K)	Steady hand game (K)	

Y1/2 A

<b>Title: MASTER COPY</b>
<u>National curriculum objectives:</u>
<b>Design</b>
<b>Make</b>
<b>Evaluate</b>
<b>Technical</b>
<b>Additional</b>

## Key Vocabulary

### Y1/2 A - Autumn 1

#### Title: Mechanism - making a moving book

##### National curriculum objectives:

- design purposeful, functional moving book which is appealing for a targeted audience
- develop, model and communicate their ideas through talking, drawing, templates, mock-ups. Following a design to create moving models that use levers and sliders
- 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 characteristic
- explore and evaluate a range of existing products
- Testing a moving book, seeing whether it moves as planned and if not, explaining why and how it can be fixed.
- evaluate their ideas and products against design criteria
- Reviewing the success of a moving book by testing it with its intended audience
- 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

##### Design

- Explaining how to adapt mechanisms, using bridges or guides to control the movement.
- Designing a moving story book for a given audience.

##### Make

- Following a design to create moving models that use levers and sliders.
- Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed.

##### Evaluate

- Reviewing the success of a moving book by testing it with its intended audience

##### Technical

- 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

##### Additional

##### Key knowledge

To know that a mechanism is the parts of an object that move together.  
To know that a slider mechanism moves an object from side to side.  
To know that a slider mechanism has a slider, slots, guides and an object.  
To know that bridges and guides are bits of card that purposefully restrict the movement of the slider.

### Key Vocabulary

sliders, mechanism, adapt, design criteria, design, input, model, template, assemble, test

## Autumn 2

### Title:Pouches (Christmas themed)

#### National curriculum objectives:

- design purposeful, functional pouch which is appealing for a targeted audience
- develop, model and communicate their ideas through talking, drawing, templates, mock-ups.
- Following a design to create a pouch.
- 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 characteristic
- explore and evaluate a range of existing products
- Testing the pouch, explaining why and how it can be fixed.
- evaluate their ideas and products against design criteria
- Reviewing the success of pouches by testing it with its intended audience

### Design

- Designing a pouch.

### Make

- 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.

## Evaluate

- Troubleshooting scenarios posed by 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 why.

## Technical

## Additional

### Key knowledge

- 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.

### Key Vocabulary

decorate, fabric, fabric glue, knot, needle, needle threader, running stitch, sew, template, thread

## Spring 2

### Title: Tudor House

#### National curriculum objectives:

- build structures, exploring how they can be made stronger, stiffer and more stable
- Evaluate against a design criteria
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics
- select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]

### Design A tudor house

- Look at a range of house and consider the features of a Tudor house

- Consider a design criteria to make the house successful
- Make a mock up of a house using 3 d nets

## Make

- Children to choose from a range of materials with different characteristics to represent a tudor house
- Consider joining different materials in the most efficient ways

## Evaluate

- Children to say what has worked well to make their house strong and stable and consider improvements

## Technical

## Additional

- Choose materials to represent the real features of a Tudor house
- To understand that the shape of materials can be changed to improve the strength and stiffness of structures.
- To understand that cuboids are a strong type of structure that are used to build houses.
- 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.

## Key Vocabulary

design, design criteria, model, net, packaging, structure, template, unstable, stable, strong, weak

## Summer 2

## Title: Pirate Paddy's Lunch

### National curriculum objectives:

- Explore and evaluate a range of existing products
- Select from and use a wide range of materials according to their characteristics
- Design purposeful, functional, appealing products for themselves and other users based on design criteria
- Build structures, exploring how they can be made stronger, stiffer and more stable

## Design

- Consider a design criteria for a lunch box and design a product selecting suitable materials

## Make

- Create a structure for the lunch box and consider joining materials and making hinges form moving parts

## Evaluate

- Evaluate the existing basket and consider improvements and solutions
- Evaluate existing lunchboxes and consider why they are functional
- Evaluate the final design through testing against the design criteria

## Technical

- Product testing look at the technical aspects needed for the design criteria

## Additional

- Consider scissor safety

## Key Vocabulary

- Evaluate, product, existing, disassemble, materials, waterproof, strong, protect, reclaimed, Select, tools, equipment, safety, area, join, tape, glue, structure, hinges

Year 1/2 - Year B

Autumn 1

## Title: Fabric faces

### National curriculum objectives:

- Explore and evaluate a range of existing products
- Select from and use a range of textiles according to their characteristics
- Select from and use a range of tools and equipment to perform practical tasks for example joining, cutting shaping and finishing
- Design purposeful, functional, appealing products for themselves and other users based on design criteria
- Generate, develop, model and communicate their ideas through talking, drawing and templates

## Design

- to design a fabric face after evaluating fabric dolls

## Make

- Fix and join a variety of textiles through sewing, gluing, stapling taping and pinning to practise skills and make a fabric face

## Evaluate :

- Evaluate joining techniques
- Share and celebrate the finished pieces
- Discuss the differences in the chosen fabrics, materials and joining techniques.
- Use the design criteria to help them evaluate their face
- Children write down two positive things about their fabric face and one thing they would improve next time.

## Technical

- Investigate, explore and name fabrics
- techniques for joining fabrics and attaching other materials e.g. glue, stapler, sticky tape and safety pin
- cutting skills following a line and using a template

## Additional

- Consider scissor safety
- To know the different names for fabrics
- To know there are different ways to join fabrics which sewing is one
- To know that different stitches can be used when sewing.
- To understand the importance of tying a knot at the start and after sewing the final stitch.

## Key Vocabulary

Explore, evaluate, design, criteria, tools, annotated drawing, textiles, materials, fabric, textile, lace, felt, corduroy, jean, satin, silk, cotton, velvet, velour, ribbon, wool, fur, hessian, join, attach, Template, cut, line, shape, oval, round, square, heart, tone



## Title: Wheels and axels

### National curriculum objectives:

- design purposeful, functional moving book which is appealing for a targeted audience
- develop, model and communicate their ideas through talking, drawing, templates, mock-ups. Following a design to create moving models that use levers and sliders
- 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 characteristic
- explore and evaluate a range of existing products
- Testing a moving book, seeing whether it moves as planned and if not, explaining why and how it can be fixed.
- evaluate their ideas and products against design criteria
- Reviewing the success of a moving book by testing it with its intended audience
- 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

### Design

- Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move.

### Make

- Creating clearly labeled drawings that illustrate movement.
- Adapting mechanisms.

### Evaluate

- Testing mechanisms, identifying what stops wheels from turning, knowing that a wheel needs an axle in order to move.

### Technical

### Additional

#### Key knowledge

- 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

### Key Vocabulary

axle, axle holder, chassis, diagram, dowel, equipment, mechanism, wheel

## Spring 2

### Title: Throne fit for a King (BBChair)

#### National curriculum objectives:

- explore and evaluate a range of existing products
- evaluate their ideas and products against design criteria
- build structures, exploring how they can be made stronger, stiffer and more stable

#### Design

- explore the strength of different structures
- Generate new ideas by sketching and modeling
- learn about different structures in natural world and everyday objects

#### Make

- Make a structure of a chair to match the design criteria
- Join materials and structures using paper, card and tape

#### Evaluate

- Test and evaluate the strength of their own structure of the chair to see if it is fit for a king
- Compare the stability of different shapes
- Identify the weakest parts of the structure
- Evaluate the strength, stiffness and stability

#### Technical

- Think about building stronger and stiffer structures by folding and rolling paper and card

#### Additional Key Knowledge

- 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.

### Key Vocabulary

design criteria, man-made, natural, properties, structure, stable, shape, model, test

## Summer 1

### Title: Fruit and vegetables

#### National curriculum objectives:

- 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
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristic
- explore and evaluate a range of existing products evaluate their ideas and products against design criteria

#### Design

- Designing smoothie carton packaging by-hand or on ICT software.

#### Make

- 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.

#### Evaluate

- Tasting and evaluating different food combinations.
- Describing appearance, smell and taste.

- Suggesting information to be included on packaging.

## Technical

## Additional

### Key knowledge

- To understand 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.

## Key Vocabulary

fruit, vegetable, seed, leaf, root, stem, smoothie, healthy, carton, design, flavour, peel, slice

Year 3/4

Year A - Autumn 1

## Title: Adapting a recipe

### National curriculum objectives:

- design purposeful, functional
- 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 characteristic
- 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

## Design

- Designing a biscuit within a given budget, drawing upon previous taste testing.

## Make

- Following a baking recipe.
- Cooking safely, following basic hygiene rules.
- Adapting a recipe.

## 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 products.
- Suggesting modifications.

## Technical

## Additional

### Key knowledge

- To know that the amount of an ingredient in a recipe is known as the 'quantity'.
- To know that it is important to use oven gloves when removing hot food from an oven.
- To know the following cooking techniques: sieving, creaming, rubbing method, cooling.
- To understand the importance of budgeting while planning ingredients for biscuits.

## Key Vocabulary

design criteria, research, texture, innovative, aesthetic, measure, cross-contamination, diet, processed, packaging

## Year A Autumn 2

## Title: Electrical posters

### National curriculum objectives:

- 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
- 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
- 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

## Design

- Carrying out research based on a given topic (e.g. The Romans) to develop a range of initial ideas.
- Generating a final design for the electric poster with consideration for the client's needs and design criteria.
- Planning the positioning of the bulb (circuit component) and its purpose.

## Make

- Mounting the poster onto corrugated card to improve its strength and withstand the weight of the circuit on the rear.
- Measuring and marking materials out using a template or ruler.
- Fitting an electrical component (bulb).
- Learning ways to give the final product a higher quality finish (e.g. framing to conceal a roughly cut edge).
- Learning to give and accept constructive criticism on own work and the work of others.
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## Evaluate

- Testing the success of initial ideas against the design criteria and justifying opinions.
- Revisiting the requirements of the client to review developing design ideas and check that they fulfil their needs.

## Technical

- 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.

## Additional

### Key knowledge

- To understand that an electrical system is a group of parts (components) that work together to transport electricity around a circuit.
- To understand common features of an electric product (switch, battery or plug, dials, buttons etc.)
- To list examples of common electric products (kettle, remote control etc.)
- To understand that an electric product uses an electrical system to work (function).
- To know the name and appearance of a bulb, battery, battery holder and crocodile wire to build simple circuits.

## Key Vocabulary

information design, design, public, design criteria, research, initial ideas, sketch, bulb, self assessment, peer assessment, feedback, develop, final design, electrical system, electric product, circuit, circuit component, bulb, battery, crocodile wires

## Year A - Spring 1

### Title: Constructing a volcano

#### National curriculum objectives:

See below

#### Design

- use research and develop design criteria create a volcano structure with lava
- 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 the success of your erupting volcano
- 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

- apply their understanding of how to strengthen, stiffen and reinforce the volcano
- 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.

#### Additional

## Key Vocabulary

Structure, stability, hollow, consistency, 2D, 3D, volcano, design, net, scoring, shape, stiff, strong

## Year A - Spring 2

### Title: Pneumatic toys

#### National curriculum objectives:

- 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
- 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
- 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

#### Design

- Designing a toy that uses a pneumatic system.
- Developing design criteria from a design brief.
- Generating ideas using thumbnail sketches and exploded diagrams.

#### Make

- Learning that different types of drawings are used in design to explain ideas clearly.
- 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.

## Technical

- 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.

## Additional

### Key knowledge

- 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.

## Key Vocabulary

mechanism, lever, pivot, linkage system, pneumatic system, input, output, component, thumbnail sketch, research, adapt, properties, reinforce, motion

## Year A - Summer 1

## Title: Mindful moments timer

### National curriculum objectives:

- 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
- 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
- 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

## Design

- Writing design criteria for a programmed timer (Micro:bit).
- Exploring different mindfulness strategies and using this research to inform my design criteria.
- Developing a prototype case for my mindful moment timer.

## Make

- Using and manipulating shapes and clipart and using computer-aided design (CAD) to produce a logo.
- Following a list of design requirements.
- Developing a prototype case for my mindful moment timer.
- Creating a 3D structure using a net.
- Programming a Micro:bit to time a set number of seconds/minutes upon button press.

## Evaluate

- Analysing a range of timers by comparing their advantages and disadvantages.
- Evaluating my Micro:bit program against points on my design criteria and amending them to include any changes I made.
- Documenting and evaluating my project.
- Understanding what logos are and why they are important in the world of design and business.
- Testing my program for bugs (errors in the code).
- Finding and fixing the bugs (debug) in my code

## Technical

- apply their understanding of computing to program, monitor and control their products.

## Additional

### Key knowledge

- To understand what variables are in programming.
- To know some of the features of a Micro:bit.
- To know that an algorithm is a set of instructions to be followed by the computer.
- To know that it is important to check my code for errors (bugs).
- To know that a simulator can be used as a way of checking that your code works before installing it onto an electronic device.

## Key Vocabulary

research, advantage, disadvantage, criteria, design, ergonomic, timer, program, loop, coding, block, variable, pause, bug, debug, instructions, net, template, develop, join, assemble, test, form, function, prototype, process, cheap, user, model, evaluate, logo, clipart, brand identity, branding, Sketchpad, computer-aided design (CAD), 2D, mindfulness

## Title: Fastenings

### National curriculum objectives:

- 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
- 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
- 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

### Design

- Writing design criteria for a product, articulating decisions made.
- Designing a personalised book sleeve.
- Making and testing a paper template with accuracy and in keeping with the design criteria.

### Make

- Measuring, marking and cutting fabric using a paper template.
- Selecting a stitch style to join fabric.
- Sewing neatly using small regular stitches.
- Incorporating a fastening to a design.

### Evaluate

- Testing and evaluating an end product against the original design criteria.
- Deciding how many of the criteria should be met for the product to be considered successful.
- Suggesting modifications for improvement.
- Articulating the advantages and disadvantages of different fastening types.

### Technical

- 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.

## Additional

### Key knowledge

- To know that a fastening is something that holds two pieces of material together.
- To know that different fastening types are useful for different purposes.
- To know that creating a mock-up (prototype) of their design is useful for checking ideas and proportions.

### **Key Vocabulary**

Fabric, Fastening, Fix, Mock-up, Stitch, Template

Year B - Autumn 1

## Title: Iron Man and torches

### National curriculum objectives:

- 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
- 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
- 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

### **Design**

- Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.
- Making a torch with a working electrical circuit and switch.

### **Make**

- Using appropriate equipment to cut and attach materials.
- Assembling a torch according to the design and success criteria.

## Evaluate

- Evaluating electrical products.
- Testing and evaluating the success of a final product.

## Technical

- 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.

## Additional

### Key knowledge

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.

### Key Vocabulary

battery, bulb, buzzer, conductor, circuit, circuit diagram, electricity, insulator, series circuit, switch, component, design, design criteria, diagram, evaluation, LED, model, shape, target audience, input, recyclable, theme, aesthetics, assemble, equipment, ingredients, packaging, properties, sketch, test

## Year B - Autumn 2

### Title: Egyptian collars

#### National curriculum objectives:

- 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
- 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
- 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

## Design

- Designing and making a template for an Egyptian collar and applying individual design criteria.
- Following their design criteria to create an Egyptian collar.

## Make

- Selecting and cutting fabrics with ease using fabric scissors.
- Threading needles with greater independence.
- Tying knots with greater independence.
- Sewing cross stitch to decorate or join fabric.
- Decorating fabric using appliqué, beads (or other embellishments), ribbon and pinking scissors.

## Evaluate

- Evaluating an end product.

## Technical

- 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.

## Additional

### Key knowledge

To know that appliqué is a way of mending or decorating a textile by applying smaller pieces of fabric.

To understand that a product's function relies on material choices.

To identify and explain some materials and explain their aesthetic and/or functional properties.

### **Key Vocabulary**

appliqué, cross-stitch, fabric, running stitch, patch, thread, embellish, template, cotton, silk, polyester, wrinkle, tear, water-resistant, breathable, matt, shiny, biodegrade, pinking

## Title: Bridges

### National curriculum objectives:

- 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
- 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
- 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

### Design

- Designing a stable bridge structure that is aesthetically pleasing and selecting materials to create a desired effect.

### Make

- Building frame structures designed to support weight.
- 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 for the cladding.
- Reinforcing corners to strengthen a structure.
- Creating a design in accordance with a plan.
- Learning to create different textural effects with materials.

### Evaluate

- Evaluating structures made by the class.
- Describing what characteristics of a design and construction made it the most effective.
- Considering effective and ineffective designs.

### Technical

- 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.

## **Additional**

### Key knowledge

To understand what a frame structure is.

To know that a 'free-standing' structure is one that can stand on its own.

To know that a bridge is a function structure.

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.

## **Key Vocabulary**

3D shapes, Cladding, Design criteria, Innovative, Natural, Reinforce, Structure

## **Year B - Spring 2**

### **Title: Eating seasonally**

#### National curriculum objectives:

- 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
- 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
- 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



## 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 workspace 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.

## Technical

## Additional

### Key knowledge

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 that has been brought into the country.

To know that exported food is food that 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

## Key Vocabulary

climate, diet, imported, ingredients, natural, processed, reared, recipe, seasonal, seasons, sugar

Year B - Summer 1

Title: Electronic charm

### **National curriculum objectives:**

- 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
- 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
- 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

### **Design**

- Problem solving by suggesting potential features on a Micro:bit and justifying my ideas.
- Developing design ideas for a technology pouch.
- Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge.

### **Make**

- Using a template when cutting and assembling the pouch.
- Following a list of design requirements.
- Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch.

### **Evaluate**

- Applying functional features such as using foam to create soft buttons.
- Analysing and evaluating an existing product.
- Identifying the key features of a pouch.

### **Technical**

- 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.

### **Additional**

#### **Key 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.

Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm.

## Key Vocabulary

smart wearables, product design, digital revolution, technology, analogue, digital, feature, function, digital world, Micro:bit, electronic products, program, loops, initiate, simulator, control, monitor, sense, template, develop, fasten, test, user, CAD (computer-aided design), point of sale, display, badge, stand, net, design requirements, layers.

## Year B - Summer 2

### Title: Making a slingshot car

#### National curriculum objectives:

- 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
- 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
- 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

#### Design

- Designing a shape that reduces air resistance.
- Drawing a net to create a structure from.

#### Make

- Choosing shapes that increase or decrease speed as a result of air resistance.
- Personalising a design.
- Measuring, marking, cutting and assembling with increasing accuracy.
- Making a model based on a chosen design.

#### Evaluate

- Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.

#### Technical

- 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.

## Additional

### Key knowledge

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.

## Key Vocabulary

chassis, energy, kinetic, mechanism, air resistance, design, structure, graphics, research, model, template

## Y5/6 Year A

### Title: Stuffed Toys-textiles

#### National curriculum objectives:

#### Design

• Designing a stuffed toy, considering the main component shapes required and creating an appropriate template. • Considering the proportions of individual components.

#### Make

• Creating a 3D stuffed toy from a 2D design. • Measuring, marking and cutting fabric accurately and independently. • Creating strong and secure blanket stitches when joining fabric. • Threading needles independently. • Using appliqué to attach pieces of fabric decoration. • Sewing blanket stitch to join fabric. • Applying blanket stitch so the spaces between the stitches are even and regular.

#### Evaluate

• Testing and evaluating an end product and giving point for further improvements.

#### Technical

• To know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric. • To understand that it is easier to finish simpler

designs to a high standard. • To know that soft toys are often made by creating appendages separately and then attaching them to the main body. • To know that small, neat stitches which are pulled taut are important to ensure that the soft toy is strong and holds the stuffing securely.

### **Additional/Key Learning ideas**

- Design a stuffed toy, considering the main component shapes of their toy.
- Create an appropriate template for their stuffed toy.
- Join two pieces of fabric using a blanket stitch.
- Neatly cut out their fabric.
- Use appliqué or decorative stitching to decorate the front of their stuffed toy.
- Use blanket stitch to assemble their stuffed toy, repairing when needed.
- Identify what worked well and areas for improvement.

### **Key Vocabulary**

Accurate, Annotate, Appendage, Blanket-stitch, Design criteria, Detail, Evaluation, Fabric, Sew, Shape, Stuffed toy, Stuffing, Template

## **World at War-structures bridges and shelters (KAPOW module)**

### **National curriculum objectives:**

- 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.
- 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 wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics.
- 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.
- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.

### **Design**

- Designing a stable structure that is able to support weight.
- Creating 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 saw safely.
- Identifying where a structure needs reinforcement and using card corners for support.
- Explaining why selecting appropriate 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/shelters and those designed by others.

## Technical

- 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.
- To understand the material (functional and aesthetic) properties of wood.

## Additional

- To understand the difference between arch, beam, truss and suspension bridges.
- To understand how to carry and use a saw safely

## Key Vocabulary

Abutment, Accurate, Arched bridge, Beam bridge, Coping saw, Evaluation, Mark out, Material properties, Measure, Predict, Reinforce, Research, Sandpaper, Set square, Suspension bridge, Tenon saw, Test, Truss bridge, Wood.

Title:

National curriculum objectives:

**Design**

**Make**

**Evaluate**

**Technical**

**Additional**

**Key Vocabulary**