

## DESIGN AND TECHNOLOGY: CURRICULUM CONTENT AND PROGRESSION FRAMEWORK

**“Invention is 10% inspiration and 90% perspiration.” - Thomas Edison**

### 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

### FOUNDATION

Curriculum Content:	The key things we want children to know/be able to do:
<p>Children have access to a wide range of materials and equipment, both natural and man-made throughout the year. They can access and explore this during continuous provision, both indoors and outdoors.</p> <p>Design and technology projects link to festivals and celebrations and include: musical instruments, Chinese lanterns and Christmas decorations.</p>	<p><b><u>Design</u></b></p> <ul style="list-style-type: none"> <li>• Select appropriate resources and materials to use.</li> <li>• Construct with a purpose in mind.</li> <li>• Represent their own ideas, thoughts and feelings.</li> </ul> <p><b><u>Make</u></b></p> <ul style="list-style-type: none"> <li>• Use a variety of natural and man-made resources.</li> <li>• Master reasonable scissor control effectively and safely to cut and use techniques (paper in one hand, scissors in the other).</li> <li>• Use malleable materials (e.g. play dough) and construction (e.g. Lego and blocks) safely with increasing control.</li> </ul> <p><b><u>Evaluate</u></b></p> <ul style="list-style-type: none"> <li>• Adapt work when necessary.</li> </ul> <p><b><u>Technical knowledge</u></b></p> <ul style="list-style-type: none"> <li>• Look at different attachment methods e.g. paper clips, glue, tape.</li> </ul>

- Select tools and techniques needed to shape, assemble and join materials being used.

**Cooking and nutrition**

- Talk about ways to keep healthy and safe.

**YEAR 1**

**Curriculum Content:**

**The key things we want children to know/be able to do:**

**Project: Puppets (sewing)**

**Brief:**

Make an embellished hand puppet to use as part of a story retelling performance for your class.

**Project: Give a Gift (sewing)**

**Brief:**

Make a small hanging ornament decorated with a range of stitch types e.g. bauble, end of year memento, lavender bag. It can be a gift for yourself, or given to someone else.

**Project: Preparing a Picnic (cooking and nutrition)**

**Brief:**

Create a range of savoury and sweet items to enjoy on a class picnic e.g. savoury pinwheels, sandwiches, sausage rolls, biscuits, frozen fruit lollies.

**Area of learning: Textiles**

**Design**

- Explore a range of existing products.
- Discuss ideas.
- Design purposeful, functional appealing products for themselves.
- Draw and label simple designs.
- Follow and refine plans as necessary.

**Make**

- Select from and use a range of tools and equipment to perform practical tasks e.g. cutting, shaping, joining and finishing.
- Use a needle and thread safely and effectively.

**Evaluate**

- Evaluate and compare against existing textile products.
- Test and evaluate the final product - is it fit for purpose?
- Reflect back on design criteria.
- Suggest improvements.
- Use peer assessment to improve their work.

**Technical knowledge**

- Use and store equipment such as needles safely.
- Follow a set of instructions in order to learn a new skill such as sewing.
- Children will learn stitch names.

**Key vocabulary**

User, textile, product, stitch

**Cooking and nutrition**

- Use the principles of a healthy and varied diet to prepare dishes.
- Understand where food comes from.

## YEAR 2

### Curriculum Content:

#### **Project: Taking Flight (wheels and axles)**

##### **Brief:**

Create a toy aeroplane for younger children. It should be fun to play with and include wheels and an axle to make it move.

#### **Project: Beetles & Butterflies (levers and sliders)**

##### **Brief:**

Create moveable pictures for a non-fiction book about native British wildlife to engage and persuade readers to protect the species.

#### **Mini Project: Food From Around the World: India (cooking and nutrition)**

##### **Brief:**

Cook a selection of Indian inspired savoury foods e.g. naan bread, samosas, understanding the origin of the ingredients.

### The key things we want children to know/be able to do:

#### Area of learning: Mechanisms

##### **Design**

- Explore a range of existing products.
- Discuss ideas.
- Design purposeful, functional appealing products for other users.
- Draw and label simple designs.
- Follow and refine plans as necessary.
- Create group or individual mock-ups.

##### **Make**

- Select from and use a range of tools and equipment to perform practical tasks e.g. cutting, shaping, joining and finishing.
- Use levers, sliders, wheels and axles to make a product that moves. Can be covered over two projects.
- Say why they have chosen moving parts.

##### **Evaluate**

- Evaluate and compare against existing products.
- Test and evaluate the final product - is it fit for purpose?
- Reflect back on design criteria.
- Suggest improvements.
- Use peer assessment to improve their work.

##### **Technical knowledge**

- Build structures, exploring how they can be made stronger, stiffer and more stable.
- Explore and use mechanisms as above.
  - Input – What do you do to make it work? Push?
  - Process – How does your product work? The wheel turns on the axel.
  - Output – what happens? The car moves.

##### **Key vocabulary**

User, function, features, aesthetics, components, resilience, input, process, output, mechanism

*NB: If opportunity to consider **food technology** focus on food production from farm to fork. Where does your food come from?*

## YEAR 3

### Curriculum Content:

#### **Project: Keep it warm! (textiles)**

##### **Brief:**

Design and make a mince pie warmer to house a mince pie and keep it warm by thinking about the insulating properties of materials.

#### **Project: Comfy cushion (textiles)**

##### **Brief:**

Create a nature inspired cushion using a uniquely designed fabric (e.g. tie dye, fabric paints, printing).

#### **Mini Project: Food From Around the World (cooking and nutrition)**

##### **Brief:**

Create a savoury dish using locally sourced produce.

### The key things we want children to know/be able to do:

#### **Area of learning: Textiles**

##### **Design**

- Consider function, aesthetics, user needs.
- Create multiple designs.
- Research key events and individuals.
- Use market research to inform plans.
- Follow a brief for a target audience.
- Follow and refine plans as necessary.
- Describe their design using an accurately labelled sketch.
- Consider culture and society in designs.
- Choose textiles both for their appearance and properties.

##### **Make**

- Select appropriate equipment e.g. needles, knitting needles, crochet hooks and materials for the task.
- Change the way they are working if needed.
- Join textiles of different types in different ways.

##### **Evaluate**

- Test and evaluate the final product - is it fit for purpose?
- Reflect back on design criteria.
- Suggest improvements.
- Use peer assessment to improve their work.

##### **Technical knowledge**

- Apply the understanding of how to strengthen and reinforce.
- Use and store equipment such as needles safely.
- Follow a set of instructions in order to learn a new skill such as crochet.

##### **Key vocabulary**

Target market, user, client, function, features, aesthetics, components, resilience, stitch, textile, material

## YEAR 4

### Curriculum Content:

#### **Project: Fairtrade Food (cooking and nutrition)**

##### **Brief:**

Prepare a selection of dishes which include Fairtrade ingredients to improve awareness of the Fairtrade foundation.

#### **Project: Food From Around the World (cooking and nutrition)**

##### **Brief:**

Prepare a selection of traditional savoury dishes from countries around the world to share with another class, catering to any specific dietary requirements.

#### **Mini Project: Building Bridges (complex structures)**

##### **Brief:**

Construct a bridge to span a required distance or hold a specified weight.

### The key things we want children to know/be able to do:

#### **Area of learning: Cooking and nutrition**

##### **Design**

- Follow brief for predominantly savoury dishes for a specific event, individual or group.
- Consider culture and society e.g. fair trade
- Use market research to inform dishes.
- Follow and refine plans as necessary.
- Justify and explain plans through discussion and annotations.

##### **Make**

- Select appropriate ingredients.
- Select and use basic hand-held and other kitchen equipment safely.
- Consider a range of cooking techniques e.g. weighing and measuring, stirring and kneading.
- Understand and follow food hygiene rules when preparing food e.g. how to store, prepare and cook.

##### **Evaluate**

- Test and evaluate the final product - is it fit for purpose?
- Suggest improvements.
- Use peer assessment to improve their product.

##### **Technical knowledge**

- Be familiar with the principles of a healthy and varied diet e.g. The Eatwell Guide.
- Show some understanding of seasonality, knowing where and how a variety of ingredients are grown, reared, caught and processed.
- Be aware of dietary needs of others e.g. allergies, intolerance or religious beliefs.

##### **Key vocabulary**

Target market, nutrition, hygiene, allergy, intolerance, diet

## YEAR 5

### Curriculum Content:

#### Project: Space Toys (cam mechanisms)

##### Brief:

Make a space themed toy for younger children which is robust, aesthetically pleasing and moves using a cam mechanism.

#### Project: Maya Museum (hydraulic systems)

##### Brief:

Make a moveable Maya head sculpture using a simple hydraulic system. The heads will feature in a museum collection informing visitors of the Maya civilisation.

#### Mini Project: Food From Around the World: Sushi (cooking and nutrition)

##### Brief:

Prepare a selection of vegetarian sushi, with a focus on knife skills.

### The key things we want children to know/be able to do:

#### Area of learning: Mechanisms

##### Design

- Consider function, aesthetics, user needs.
- Create multiple designs.
- Research key events and individuals.
- Use market research to inform plans.
- Follow a brief for a target audience.
- Draw own designs, neatly with colour.
- Follow and refine plans as necessary.
- Justify and explain plans through discussion and annotations.
- Consider culture and society in designs.

##### Make

- Make and develop one idea to fit the brief.
- Use a ruler to measure in cm and mm.
- Use junior saws and hand drills.
- Use a file and sandpaper to finish.
- Select appropriate materials.
- Change the way they are working if needed.

##### Evaluate

- Test and evaluate the final product - is it fit for purpose?
- Reflect back on design criteria.
- Suggest improvements.
- Use peer assessment to improve their work.
- Consider how your work compares to key events and individuals researched.

##### Technical knowledge

- Understand how to strengthen, stiffen and reinforce structures.
- Understand and use mechanical systems in their products for example, gears, pulleys, cams, levers and linkages.
  - Input – What do you do to make it work? Push, pull?
  - Process – The mechanism that makes the output happen such as a handle which makes a cog turn.
  - Output – what happens? Do wheels spin?

	<ul style="list-style-type: none"> <li>Consider categories and properties of materials used e.g. wood – what type? Pine? Oak? Manmade?</li> </ul> <p><b>Key vocabulary</b> Target market, user, client, function, features, aesthetics, components, resilience, input, process, output</p>
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**YEAR 6**

Curriculum Content:	The key things we want children to know/be able to do:
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**Project: Fairground Ride (electrical systems)**  
**Brief:**  
 Examine a variety of rotating fairground rides before designing and creating a ride using an electrical motor.

**Project: Rotating Night Light (electrical systems)**  
**Brief:**  
 Children will investigate night lights, thinking about the function and design, before designing and creating their own.

**Mini Project: Food From Around the World (cooking and nutrition)**  
**Brief:**  
 Thinking about the learning children will have done in science relating to healthy eating, children will design and make a nutritionally balanced meal, based on the traditional food of a country studied.

- Area of learning: Electrical systems as part of a product**
- Design**
- Consider function, aesthetics, user needs.
  - Create multiple designs.
  - Research key events and individuals.
  - Use market research to inform plans.
  - Follow a brief for a target audience.
  - Sketch circuit plans.
  - Follow and refine plans as necessary.
  - Justify and explain plans through discussion and annotations.
  - Consider culture and society in designs.
- Make**
- Select appropriate equipment and materials for the task.
  - Change the way they are working if needed.
  - Incorporate an electrical element to the product.
- Evaluate**
- Test and evaluate the final product - is it fit for purpose?
  - Reflect back on design criteria.
  - Suggest improvements.
  - Use peer assessment to improve their work.
  - Consider how your work compares to key events and individuals researched.
- Technical knowledge**
- Understand and use electrical systems in their products for example, switches, bulbs, buzzers and motors.
    - Input – What do you do to make it work? Flick a switch?
    - Process – How does your circuit connect to make the product work?
    - Output – what happens? Does a light come on?

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

**Key vocabulary**

Target market, user, client, function, features, aesthetics, components, resilience, input, process, output

*See science curriculum for electrical vocabulary.*

**GLOSSARY**

**Design and Technology**

- **Target market** - a particular group of consumers at which a product or service is aimed
- **User** – A person who will interact or ‘use’ the product
- **Client** - A company or organisation who has asked you to produce a product.
- **Function** – The job of the product (Entertainment , Educational etc)
- **Features** -
- **Aesthetics** – How the product looks. Consider colour, shape and texture.
- **Components** – parts that when combined create a product
- **Input** - a device through which, energy or information enters a system
- **Process** – components or mechanism that produce change
- **Output** – a place where power or information leaves a system.
- **Context** – the setting or background information for the brief
- **Brief** – initial outline of what is required
- **Work of others** - teamwork
- **Annotate** – notes
- **Specification** – a set of rules for the product, a list of musts
- **Modelling** – a trial version
- **CAD** – Computer Aided Design
- **CAM** – Computer Aided Manufacture
- **Ergonomics** – making products that humans can operate efficiently

**Cooking and Nutrition**

- **Nutrition**
- **Hygiene**
- **Allergy**
- **Intolerance**
- **Diet**
- **Gluten formation**
- **Gelatinisation,**
- **Shortening**
- **Coagulation**