



# DT Year 6 Curriculum Overview

DT must be covered in Autumn 2, Spring 2, Summer 2 and is alternated with Art (in remaining half terms)

## The Big Picture

Within Mechanisms, children will begin to understand that mechanisms are researched, designed, made and evaluated. They will have the opportunity to research different products which use gears and pulleys, for example, fairground ride with gears or pulleys e.g. carousel, Ferris wheel, controllable toy vehicle with gears or pulleys e.g. dragster, off-road vehicle, sports car, lorry. They will use their research to design their cable car and will learn how to develop a design specification for a product. When doing so they will be reminded to take into account constraints including time, resources and cost. They will continue to develop innovative ideas and share and clarify these through discussion. These will be communicated ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagram. After the design stage, they will make their cable car. They will formulate a step by-step plan to guide making, listing tools, equipment, materials and components. By this point, they will be able to competently select from and use appropriate tools to accurately measure, mark, cut and assemble materials, and securely connect electrical components to produce reliable, functional products. Once they have made their products, they will evaluate it. They will critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.

## What do we already know? What can we already do?

- Know and understand how to use lever and linkages mechanisms
- Know the difference between a fixed and loose pivot
- Know how to create guides to control movement

### Year 6 DT- Mechanisms Pulleys and Gears Autumn 2

#### NC objectives – Key Stage 2

##### Pupils should be taught:

##### 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

#### Specific unit objectives

##### Mechanisms – Pulleys and Gears

- To know and understand what a gear and pulley is.
- To understand the ratio in a gear or pulley system (how often larger wheels turn in relation to small pulleys or the number of teeth in gears).
- To be able to identify gear and pulley mechanisms in everyday objects.

##### Research (objectives to cover all year)

- To explore some existing products- does the product have any other purpose? How environmentally friendly is the product? How environmentally friendly are the resources? How much does it cost to buy?
- To research how much it costs to make the product, to sell the product and what the profit margin would be.
- To research and find out about famous inventors and designers.

##### Design (objectives to cover all year)

- To use research using surveys, interviews, questionnaires and web-based resources to develop a design specification for a product.
- To develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost.
- To generate and develop innovative ideas and share and clarify these through discussion.
- To communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams.

##### Make (objectives to cover all year)

- To formulate a step by-step plan to guide making, listing tools, equipment, materials and components.
- To competently select from and use appropriate tools to accurately measure, mark, cut and assemble materials, and securely connect electrical components to produce reliable, functional products.
- To demonstrate problem solving skills when encountering a mistake or problem.
- To use finishing and decorative techniques suitable for the product they are designing and making.

##### Evaluate (objectives to cover all year)

- To continually evaluate and modify the working features of the product to match the initial design specification.
- To critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.
- To test the system to demonstrate its effectiveness for the intended user and purpose.

#### Key vocabulary and understanding for concept connectors

Mechanisms: pulley, gear, wheel, ration, system, teeth, mechanisms.

#### Sticky Knowledge

- A gear is a wheel with teeth around its circumference.
- A pulley is a grooved wheel over which a drive belt can run

#### Key Questions

- Do they know and understand what a gear and pulley is?
- Do they understand the ratio in a gear or pulley system (how often larger wheels turn in relation to small pulleys or the number of teeth in gears)?
- Can they identify gear and pulley mechanisms in everyday objects?

#### Key designers/ architects/ inventors:

Andrew Smith Hallidie



# DT Year 6 Curriculum Overview

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## The Big Picture

Within Food, children will continue to develop their awareness around food and its nutritional benefits. They will develop an understanding of where food comes from, looking specifically at the farm to fork process for different ingredients. They will begin to understand the environmental impact on future products, as well as the cost of production. They will have the opportunity to research different biscuits from around the world and will look at the famous baker, Mary Berry. They will use their research to design their biscuit and will learn how to develop a design specification for a product. When doing so they will be reminded to take into account constraints including time, resources and cost. They will continue to develop innovative ideas and share and clarify these through discussion. These will be communicated ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagram. After the design stage, they will make their biscuit. They will formulate a step by-step plan to guide making, listing tools, equipment, materials and components. By this point, they will be able to competently select from and use appropriate tools to accurately measure, mark, cut and assemble materials, and securely connect electrical components to produce reliable, functional products. Once they have made their products, they will evaluate it. They will critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.

## What do we already know? What can we already do?

- Understand and name different foods and drinks that provide different substances the body needs to be healthy and active.
- Understand seasonality and the advantages of eating seasonal and locally produced food.
- Know that recipes can be adapted to change the appearance, taste, texture and aroma of foods.
- Know and follow a range of safety and food hygiene procedures



### NC objectives – Key Stage 2

#### Pupils should be taught:

##### 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.

### Specific unit objectives

#### Food- Celebrating Culture and Seasonality

- To understand where food comes from, describing the process of 'farm to fork' for a given ingredient.
- To understand the environmental impact on future product and cost of production.
- To know that a recipe can be adapted by adding or substituting one or more ingredients.
- To know and name safety and food hygiene procedures and follow these strictly

#### Research (objectives to cover all year)

- To explore some existing products- does the product have any other purpose? How environmentally friendly is the product? How environmentally friendly are the resources? How much does it cost to buy?
- To research how much it costs to make the product, to sell the product and what the profit margin would be.
- To research and find out about famous inventors and designers.

#### Design (objectives to cover all year)

- To use research using surveys, interviews, questionnaires and web-based resources to develop a design specification for a product.
- To develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost.
- To generate and develop innovative ideas and share and clarify these through discussion.
- To communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams.

#### Make (objectives to cover all year)

- To formulate a step by-step plan to guide making, listing tools, equipment, materials and components.
- To competently select from and use appropriate tools to accurately measure, mark, cut and assemble materials, and securely connect electrical components to produce reliable, functional products.
- To demonstrate problem solving skills when encountering a mistake or problem.
- To use finishing and decorative techniques suitable for the product they are designing and making.

#### Evaluate (objectives to cover all year)

- To continually evaluate and modify the working features of the product to match the initial design specification.
- To critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.
- To test the system to demonstrate its effectiveness for the intended user and purpose.

### Key vocabulary and understanding for concept connectors

Food: farm to fork, ingredients, environmental impact, future production, cost, recipe, adapting, safety, hygiene procedures.

### Sticky Knowledge

- Farm to fork is the process of production, processing, distribution, and consumption of food.
- A recipe can be adapted by adding or substituting one or more ingredients.

### Key Questions

- Do they understand where food comes from, describing the process of 'farm to fork' for a given ingredient?
- Do they understand the environmental impact on future product and cost of production?
- Do they know that a recipe can be adapted by adding or substituting one or more ingredients?
- Do they know and name safety and food hygiene procedures and follow these strictly?

### Famous Chef

Mary Berry



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## The Big Picture

Within Electrical Systems, children will continue to develop their understanding around electrical circuits, alongside their science unit too. They will now understand how to stay safe around electricity, building upon their knowledge from Year 4, both in DT and Science. Children will have the opportunity to research different electrical board games played around the world, which include electrical circuits. They will design their own electrical board game in groups or pairs. They will use their research to design their electrical board game and will learn how to develop a design specification for a product. When doing so they will be reminded to consider constraints including time, resources and cost. They will continue to develop innovative ideas and share and clarify these through discussion. These will be communicated ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagram. After the design stage, they will make their electrical board game. They will formulate a step by-step plan to guide making, listing tools, equipment, materials and components. By this point, they will be able to competently select from and use appropriate tools to accurately measure, mark, cut and assemble materials, and securely connect electrical components to produce reliable, functional products. Once they have made their products, they will evaluate it. They will critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.

## What do we already know? What can we already do?

- Know and understand what an electrical circuit is
- Know and understand what a bulb, buzzer and switch is and their functions.
- Can construct a simple series circuit to generate static electricity.
- Know how to make simple secure connections.

**Year 6 DT- Electrical Systems**  
**More complex circuits and switches**  
**Summer 2**

## NC objectives – Key Stage 2

### Pupils should be taught:

#### 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
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#### 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

## Specific unit objectives

### Electrical Systems – More complex circuits and switches

- To know how to construct a simple series circuit confidently (building on Y4).
- To know different switch types e.g. push to break, push to make, reed and toggle switch.
- To know how to test components and assess faults in a series circuit.
- To know that mechanical and electrical systems have an input, process and output.

### Research (objectives to cover all year)

- To explore some existing products- does the product have any other purpose? How environmentally friendly is the product? How environmentally friendly are the resources? How much does it cost to buy?
- To research how much it costs to make the product, to sell the product and what the profit margin would be.
- To research and find out about famous inventors and designers

### Design (objectives to cover all year)

- To use research using surveys, interviews, questionnaires and web-based resources to develop a design specification for a product.
- To develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost.
- To generate and develop innovative ideas and share and clarify these through discussion.
- To communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams.

### Make (objectives to cover all year)

- To formulate a step by-step plan to guide making, listing tools, equipment, materials and components.
- To competently select from and use appropriate tools to accurately measure, mark, cut and assemble materials, and securely connect electrical components to produce reliable, functional products.
- To demonstrate problem solving skills when encountering a mistake or problem.
- To use finishing and decorative techniques suitable for the product they are designing and making.

### Evaluate (objectives to cover all year)

- To continually evaluate and modify the working features of the product to match the initial design specification.
- To critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.

## Key vocabulary and understanding for concept connectors

Electrical Systems: simple series circuit, switch types, push to break, push to make, reed and toggle switch, test components, faults, mechanical, electrical, input, process, output.

## Sticky Knowledge

- Lights and buzzers are output devices.
- Batteries and switches are input devices.
- A bulb is a component that lights up when electricity flows through it and a switch is a component that opens and closes the electrical circuit.

## Key Questions

- Do they know how to construct a simple series circuit confidently (building on Y4)?
- Do they know different switch types e.g. push to break, push to make, reed and toggle switch?
- Do they know how to test components and assess faults in a series circuit?
- Do they know that mechanical and electrical systems have an input, process and output?

## Key designers/ architects/ inventors:

N/A