



The BIG Picture

Children love to build and have used construction toys since the earliest days in Foundation and before. Here they learn the science behind bridge construction and which forces are at play. They will investigate various structures, testing their strengths, capabilities and suitability to bridge design before creating their own unique bridge.

NC Objectives- Key Stage Pupils should be taught:

- * 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.

Key Questions

- What are a try-square and a set-square?
- Describe a truss?
- What is a cutting template used for?
- What are material properties?

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

The learning in this study builds on that in the Y3 structures unit, Castles. Here the children developed understanding of 3D shapes and their component nets to create sturdy castles.

Specific unit outcomes

- Identify stronger and weaker shapes.
- Recognise that supporting shapes can help increase the strength of a bridge, allowing it to hold more weight.
- Identify beam, arch and truss bridges and describe their differences.
- Use triangles to create simple truss bridges that support a load (weight).
- Cut beams to the correct size, using a cutting mat.
- Smooth down any rough cut edges with sandpaper.
- Follow each stage of the truss bridge creation as instructed by their teacher.
- Complete a bridge, with varying ranges of accuracy and finish, supported by the teacher.
- Identify some areas for improvement, reinforcing their bridges as necessary.

Key Skills

- Designing a stable structure that is able to support weight.
- Creating a frame structure with focus on triangulation. 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.
- 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.

Key Knowledge

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

Key vocabulary & understanding:

- beam bridge arch bridge
- truss bridge strength
- Technique corrugation
- Lamination stiffness
- Rigid factors
- Stability visual appeal
- Aesthetics joints
- mark out hardwood
- Softwood wood file/rasp
- sandpaper/glasspaper
- bench hook/vice
- tenon saw/coping saw
- assemble
- material properties
- Reinforce wood sourcing
- Evaluate quality of finish
- accuracy





The **BIG** Picture

It is vital that our children learn to consider health and nutrition when they make eating choices and as they learn to cook. This unit supports this vital learning whilst, importantly, helps them to consider how to adapt a meal to include healthier options.

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

Here, we build on the learning from the Eating Seasonally study in Year 3 where the children learn how the seasons dictate the taste of fresh fruit and vegetables and how that influences recipes.

Key vocabulary & understanding:

beef
reared
processed
ethical
diet
ingredients
supermarket
farm
balanced

NC Objectives- Key Stage

Pupils should be taught:

- *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 materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities.
- *Understand how key events and individuals in design and technology have helped shape the world. Understand and apply principles of a healthy and varied diet.
- *Prepare and cook 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

Key Questions

- What does a balanced diet consist of?
- In a recipe what is the method?
- What meat comes from a cow?

Specific unit outcomes

- Understand how beef gets from the farm to our plates.
- Present a subject as a poster with clear information in an easy to read format.
- Contribute ideas as to what a 'healthy meal' means.
- Notice the nutritional differences between different products and recipes.
- Recognise nutritional differences between two similar recipes and give some justification as to why this is.
- Work as a team to amend a bolognese recipe with healthy adaptations.
- Follow a recipe to produce a healthy bolognese sauce.
- Design packaging that promotes the ingredients of the bolognese.

Key Skills

- 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. Cutting and preparing recipes 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.
- Identifying the nutritional differences between different products and recipes.
- Identifying and describing healthy benefits of food groups.

Key Knowledge

- To understand where meat comes from – learning that beef is from cattle and how beef is reared and processed, including key welfare issues.
- To know that I can adapt a recipe to make it healthier by substituting ingredients.
- To know that I can use a nutritional calculator to see how healthy a food option is.
- To understand that 'cross-contamination' means that bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects



Links with computing:

Using search engines to research variations of a recipe



The **BIG** Picture

Within this unit of study, our children will continue to develop their understanding around electrical circuits, supplementing their studies in science. They will now develop and integrate a more complicated series circuit to create a fun and appealing greeting card for an occasion of their choice.

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

This unit builds on the knowledge and skills taught in the Year 4 unit, Torches, where the children learned about staying safe and how simple electrical systems work.

Key vocabulary & understanding:

Battery
Buzzer
Circuit
Component
Conductor
Copper
Design
Design criteria
Function
Graphite
Innovate
Insulator
LED
Modify
Parallel circuit
Series circuit
Switch
Target audience test

NC Objectives- Key Stage

Pupils should be taught:
* Understand how key events and individuals in design and technology have helped shape the world.
* 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 and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
* 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
Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors].
* Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.

Specific unit outcomes

To explore, analyse and evaluate greeting cards
To experiment and construct a functional series circuit.
To create a moodboard to help inspire and generate a range of design ideas
To create a final electronic greeting card, compete with a functional series circuit.

Key Skills

To draw a series circuit diagram and symbols.
To construct a series circuit that includes a component.
To be able to integrate a series circuit into a greeting card.
To create a mood board to incorporate their design ideas.
To construct a greeting card with an integrated circuit and switch.

Key Knowledge

To know that electricity needs a complete circuit to flow around.
To know that switches work by making and closing a gap in a circuit.
To know that electricity travels at the speed of light.
To know and name different components.

Key Questions

What is product analysis?
Describe this circuit.
What is a series circuit?
What is a circuit component?

