

Year 6 Construction and electrical systems – Shelters with a light

Prior Learning

Year 3 Construction – Chairs

- Create shell or frame structures,
- strengthen frames with diagonal struts
- Make structures more stable by giving them a wide base
- Strengthen with shapes e.g - triangles
- Prototype frame and shell structures

Year 4 and Y6 – Science - Electricity

Key Vocabulary

Frame - a rigid structure that surrounds something

Reinforce - strengthen or support

Triangulation- formation of or division into triangles to strengthen a structure.

Stability- the state of being stable.

Adhesive - a substance used for sticking objects or materials together; glue.

Construct - Build or make (something, typically a building, road, or machine).

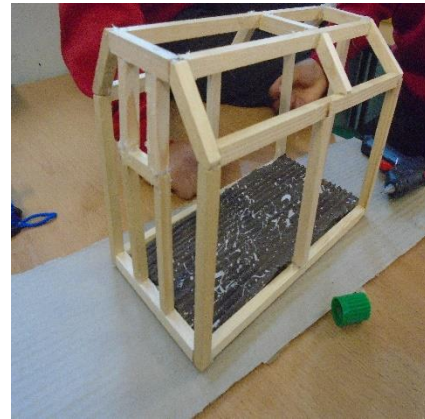
Assemble - Fit together the separate component parts of (a machine or other object).

Joint – the point where two pieces of wood join

Electrical Circuit – a pathway that carries an electrical current

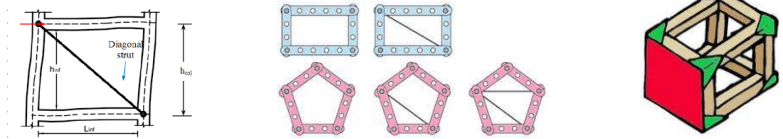
Output devices – components that produce an outcome – e.g buzzers/motors

Input devices – components that control a circuit – e.g switches/sensors



Key Knowledge

Understand how to strengthen, stiffen and reinforce 3-D frameworks.



Know and use technical vocabulary relevant to the project.

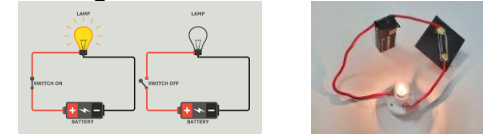
Investigate different frame structures both temporary and permanent e.g bus shelters, tents etc

Be aware of the different shelters used in WW2 for protection from bombing – Anderson Shelters, Morrison Shelters and how they were constructed

Join the sectioned pieces of wood

Know how to make a complete electrical circuit

Add a switch and a light to a circuit and house within the shelter



Key Skills

- Cut strip wood, dowel, square section wood accurately to 1mm
- Join materials using appropriate methods
- Build frame works using a range of materials e.g. wood, card corrugated plastic
- Use glue-gun with close supervision
- Can complete an electrical circuit including a switch and a light bulb

Learning Objectives

Innovator Study- Rafael Sergio Smith: American designer of the 'Uber' Shelter for disaster relief

Health & Safety

All children need to be supervised closely when using hacksaws, drills and glue guns.

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

End Points and Assessment Of Core Learning

Designing:

Understanding contexts, users and purposes - carry out research; develop a simple design specification; describe the user, purpose and design features of their products and explain how they will work.

Generating, developing, modelling and communicating ideas - generate innovative ideas drawing on research; use a range of drawing skills, discussion, prototypes, pattern pieces and computer-aided design where appropriate.

Making:

Planning - formulate lists of resources and step-by-step plans; select suitable tools, equipment, materials and components and explain their choices.

Practical skills and techniques - follow procedures for safety and hygiene; use a wider range of materials and components; measure, mark out, cut, shape, assemble, join, combine and finish with accuracy.

Evaluating:

Own ideas and products - identify strengths and areas to develop in their ideas and products against their design specification; consider the views of others to make improvements.

Existing products - investigate how well products have been designed and made, whether they are fit for purpose and meet user needs; why materials have been chosen, the methods of construction used, how well they work, and how innovative and sustainable they are.

Key events and individuals - know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.

Technical Knowledge:

Making products work - know that materials have functional and aesthetic qualities; that systems have an input, process and output;; how to reinforce and strengthen a framework; use the correct technical vocabulary.