Medium Term Plan – Design Technology - Structures – Frame structures

N.C POS:

- *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 and prototypes.*
- *Select from tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] accurately.*
- *Investigate and analyse a range of existing products.*
- *Evaluate their ideas and products against their own design criteria.*
- *Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.*

Concept: technology, impact, legacy, change, inventions, innovation, application, cause and effect.

Key Vocabulary: frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent, design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional.

Prior Learning: Experience of using measuring, marking out, cutting, joining, shaping and finishing techniques with construction materials. Basic understanding of what structures are and how they can be made stronger, stiffer and more stable.

Core Knowledge- non-negotiable

Explore

- Children investigate and make annotated drawings of a range of portable and permanent frame structures, e.g. tents, bus shelters, umbrellas. Use photographs and web-based research to extend the range e.g. How well does the frame structure meet users' needs and purposes? Why were materials chosen? What methods of construction have been used? How has the framework been strengthened, reinforced and stiffened? How does the shape of the framework affect its strength? How innovative is the design? When was it made? Who made it? Where was it made?
- Children could research key events and individuals related to their study of frame structures e.g. Stephen Sauvestre – a designer of the Eiffel Tower; Thomas Farnolls Pritchard – designer of the Iron Bridge. They could also learn about locally important design and technology activity related to their project.

Designing

- Carry out research into user needs and existing products, such as: surveys, interviews, questionnaires and web-based resources.
- Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost, presenting this information in graphs, charts or tables.
- Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches.
- Formulate a clean plan, including a step-by-step list of what needs to be done and lists of resources to be used.

- Research key events and individuals relevant to frame structures.

Making

- Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and use joining techniques as seen in K.O to make frameworks.
- Use finishing and decorative techniques suitable for the product they are designing and making.

Evaluating

- Investigate and evaluate a range of existing frame structures.
- Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development.
- Carry out appropriate tests. Eg: Use of weights to test strength of structure.

Wider Influences

- Shape and space (Maths).
- Festivals
- Celebrations
- Transport (History World War Transport).
- Our school
- Toys and games
- Outdoors
- Our local community (What is in our area? Compare to another area within the UK).
- Weather (Geography – weathering different materials).
- Countries and cultures

Enduring Understanding

- Understand how to strengthen, stiffen and reinforce 3-D frameworks.
- Know and use technical vocabulary relevant to the project.

Job Opportunities

- Mechanical Engineer, Architect, Surveyor.