

What? (Key Knowledge)

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.

Designing

- Carry out research into user needs and existing products, using 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.
- Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches.

Making

- Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used.
- Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks.
- Use finishing and decorative techniques suitable for the product they are designing and making.

Evaluating

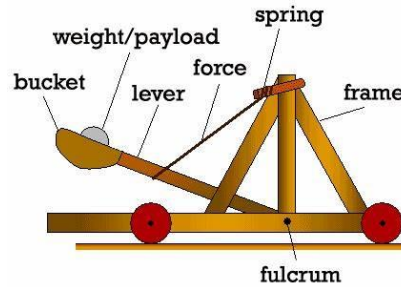
- Investigate and evaluate a range of existing frame structures.
- Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.
- Research key events and individuals relevant to frame structures.

Technical knowledge and understanding

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

Possible Experiences

Design, make and evaluate a Mangonel Catapult.



Focus on :  
Measuring strength and stability

What is the purpose of a Roman Catapult?

What? (Key Vocabulary)

Spelling	Definition/ Sentence
Ballista	Type of catapult that works a little like a crossbow
Trebuchet	Catapult that uses a counterbalanced weight to fling the object forward
Mangonel	Catapult that uses a bucket and long wooded arm to fling the object forward
Onager	Similar to a Mangonel, but uses a sling to throw items
Prototype	a first or preliminary version of a device or vehicle from which other forms are developed.
Triangulation	the use of triangular shapes to strengthen a structure.

Diagrams

Diagrams illustrating construction techniques:

- Joining thin sectioned pieces of wood:**
  - Card strips can be used to make joints (Use PVA glue)
  - Elastic bands or string can be used to make joints
  - Card triangles can be used to make joints
- Using square section wood:**
  - Glue - use sparingly
  - Card corners

Below the diagrams is a photograph of a prototype catapult made from wooden sticks and rubber bands, with a small white cup of blue liquid nearby. The text below the photo reads: "<- Prototype of catapult"