



Year 6 Design and Technology: Structures

How can we design and make a strong and stable frame structure?



Prior Learning

- I have some experience of using measuring, marking out, cutting, joining, shaping and finishing techniques with construction materials.
- I have a basic understanding of what structures are and how they can be made stronger, stiffer and more stable.

Sticky Knowledge

- Understand how to strengthen, stiffen and reinforce 3-D frameworks.
- Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources.
- Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches.
- Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used.
- 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.
- 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.

Vocabulary

User*	The person or people who will use the product.
Purpose*	What the product will be used for.
Function*	What the product should be able to do to work properly.
Design*	A plan or idea of what the product will be like and how it will function.
Innovative *	A new or inventive idea.
Modelling	The process of making a 3-D representation of a structure or product.
Compression	The application of pressure to squeeze an object.
Tension	A force pulling on a material or structure.
Strut	A part of a structure under compression.
Frame structure	A structure made from thin components e.g. tent frame.
Triangulation	The use of triangular shapes to strengthen a structure.

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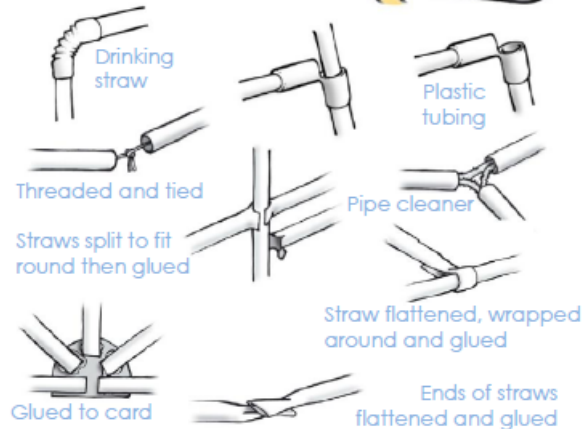


Techniques for building frame structures

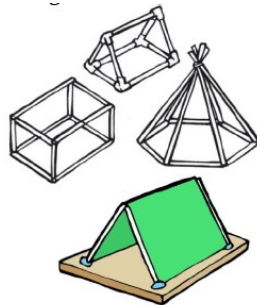
Roll paper to make tubes for construction



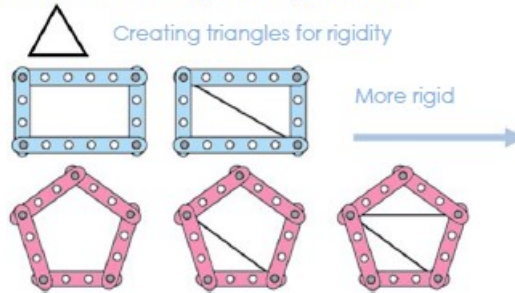
Joining straws



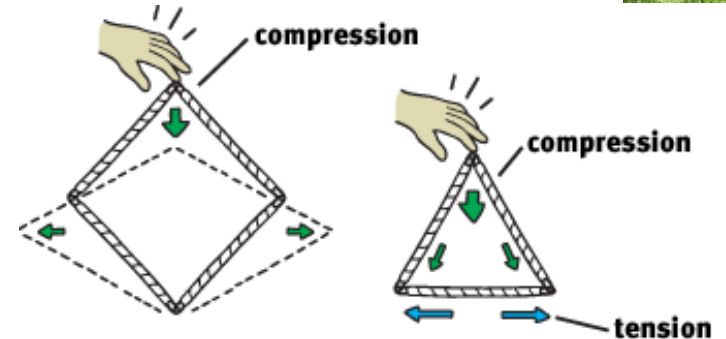
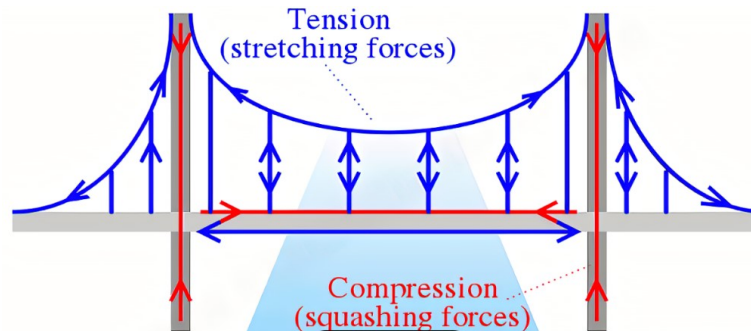
One straw creased and inserted
Flattened and glued
Pipe cleaner
Sleeve glued around joint
Sticky tape



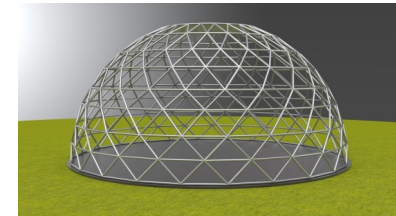
Understanding triangulation



What is tension and compression?



Triangles are the strongest shape as any force added is shared equally between all three sides.



How have tents evolved over time? Why have there been so many innovations?



Natural resources such as branches and fabric.



Frame tents with metal poles.



Dome tents with fiberglass poles.



Pop up tents with fiberglass poles.



Air tents using inflated beams instead of poles.