

Inquiry Question: What are 3D frameworks?

Key Vocabulary

Design	Make	Evaluate	3D Structure
Framework	Toughness	Strength	Presentation
Malleability	Foundations	Triangulation	Rigid
Vertical	Horizontal	Diagonal	Restraint

Key Learning

Understand how to strengthen, stiffen and reinforce 3-D frameworks and can use them accurately and appropriately.

Know and confidently use technical vocabulary relevant to the project.

Skills

Design

Use research using surveys, interviews, questionnaires and web-based resources to develop a design specification for a range of functional products.

Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost.

Generate and develop innovative ideas and share and clarify these through discussion.

Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams.

Make

Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components.

Competently select from and use appropriate tools to accurately measure, mark, cut and assemble materials, and securely connect electrical components to produce reliable, functional products.

Use finishing and decorative techniques suitable for the product they are designing and making.

Evaluate

Continually evaluate and modify the working features of the product to match the initial design specification.

Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.

Test the system to demonstrate its effectiveness for the intended user and purpose.

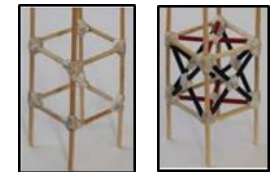
In Year 5, you learn how to;

- Build more complex 3D structures and apply his/ her knowledge of strengthening techniques to make them stronger or more stable.
- Know and use technical vocabulary relevant to the project.

Overview

Remember your prior learning, a wider base can help a structure to be more secure. Frames should be able to stand on their own, providing a 'skeleton structure.' You may wish to consider a foundation/ anchoring system, where appropriate.

You should be able to consider the most appropriate materials for your frame structure, considering a number of properties (e.g. weight, toughness, malleability, strength and presentation) depending upon the nature of your project.



Triangulation can help to make structures stronger. This is important to consider when creating stable joints. Triangulation is also important when bracing. When force is applied to one point on the triangle, the pressure is shared amongst the other two points, which provide a secure wide base. Using bracing, you can create triangular shapes, can therefore make your structure more rigid from different angles.

Design stage should include: step-by-step plan, annotated sketches, listing tools & materials.

A 3D frame structure works by... It's purpose is...

The restraints I used are... They are successful because...

My structure is strong and rigid because...

