



DT- Freestanding structures... Bridges.

This topic focuses upon planning, designing, testing and building a successful bridge for a train to pass over. Design, make and evaluate a bridge strong enough for a toy train to pass over.

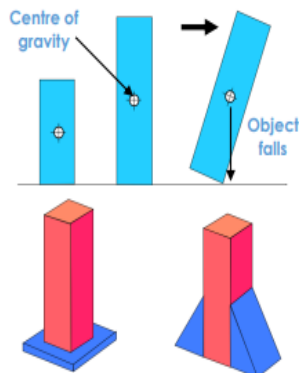
Sticky knowledge:

A beam bridge is made by building two piers or towers. Boards are placed over the piers to make a bridge. These types of bridges aren't very strong.

A truss bridge is stronger than a beam bridge because the trusses help distribute some of the weight. The trusses run horizontally between each beam.

Arch bridges are very strong. Ancient Romans made arch bridges out of stone. These bridges were made of columns joined by arches.

Inspiration:



As a freestanding structure becomes taller its centre of gravity rises. Stability in a structure can generally be increased by making the base wider, making the base heavier or adding buttresses. Ask the children to build and explore a variety of freestanding structures through focused tasks. Use a range of construction kits.

Wider bases and buttresses for stability

Key Skills:

Designing

- Generate ideas based on simple design criteria and their own experiences, explaining what they could make.
- Develop, model and communicate their ideas through talking, mock-ups and drawings.

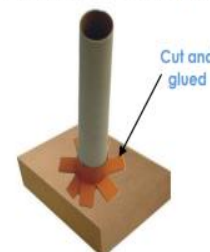
Making

- Plan by suggesting what to do next.
- Select and use tools, skills and techniques, explaining their choices.
- Select new and reclaimed materials and construction kits to build their structures.
- Use simple finishing techniques suitable for the structure they are creating.

Evaluating

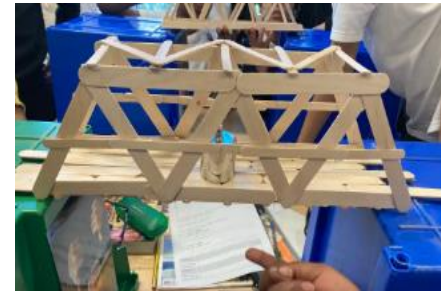
- Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings.
- Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria.

Show children how to join sheet materials and reclaimed boxes together using different tapes and glues.



Key words:

<u>Vocabulary</u>	<u>What it means...</u>
Cut	To separate neatly.
Fold	To bend neatly.
Join	To attach together.
Fix	To join or repair.
Test	To ensure it is suitable for purpose.



Glossary

- **Freestanding structure** – a structure that stands on its own foundation or base without attachment to anything else.
- **Frame structure** – a structure made from thin components e.g. tent frame.
- **Shell structure** – a hollow structure with a thin outer covering.
- **Stability** – in relation to a freestanding structure, the extent to which it is likely to fall over if a force is applied.
- **Buttress** – a structure added to a wall, tower or framework to make it more stable and/or reinforce it.
- **Brick bonding** – arranging bricks in a wall to improve the performance of the structure or improve its appearance.
- **Mock-up** – 3-D representation of a product.