

YR 1 & 2: FREESTANDING STRUCTURES KNOWLEDGE ORGANISER




Sticky Knowledge

Freestanding Structures

Structures are things that are built for a purpose.



- Structures can be large (e.g. buildings and bridges) or small (e.g. chairs and tables).
- Freestanding structures are structures that can stand up without being attached to something else.
- Freestanding structures need to support their own weight and also the weight of the things/people using them.

So that they can do this, freestanding structures need to be well-designed: strong, rigid and stable.

Designing – What makes a strong, stable, rigid structure?

The buttress adds width to the base, making the structure more stable.

Triangles are a strong shape.

- A structure that is stable is less likely to fall over.
- A structure that is strong and rigid is able to support more weight.
- Structures are more stable when they have a wider base.
- Buttresses can also make a structure more stable. A buttress is something that supports/ is built against a structure to give it more stability.

Material Properties

- The materials used to build structures need to be thought about. For example, steel is often used instead of wood. This is because it is strong but not too heavy. It can resist fire and terminates that eat wood.
- Folding and layering (adding an extra layer) of materials can also be used to strengthen and stiffen structures. For example, card is more rigid and stronger than paper.

Key Vocabulary:

Structures

Freestanding

Support

Weight

Strong

Rigid

Stable

Base

Materials

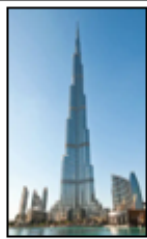

Layering

Design

Make

Evaluate

Example Structures

	<p>Name: Burj Khalifa</p> <p>Location: Dubai, United Arab Emirates</p> <p>Height: 828m</p> <p>Floors: 163</p> <p>Built in: 2010</p>	<p>-The Burj Khalifa is the <u>tallest freestanding structure</u> in the world.</p> <p>-It has an extremely <u>wide base</u>, and is very <u>narrow at the top</u>.</p> <p>-The steps down the sides help to protect the structure from the wind.</p> <p>-It has deep <u>foundations</u> in the ground.</p> <p>-It is made of <u>strong, rigid materials</u> – over 330,000m³ of concrete and 40,000 tons of steel reinforcement!</p>
	<p>Name: Forth Bridge</p> <p>Type: Railway Bridge</p> <p>Location: Scotland</p> <p>Length: 2,528m</p> <p>Built in: 1890</p>	<p>-The Forth Bridge is a <u>long railway bridge</u> in Scotland, across the Firth of Forth.</p> <p>-It is made of <u>strong materials</u>: it was one of the first bridges made of <u>steel</u>. The steel frame is built into <u>triangles</u> (a <u>wide base</u> and narrow top. It also has <u>strong, stable concrete arms supporting on either side</u>.</p>


Making & Evaluating

Making

- Read your plan carefully. Make sure that you are prepared.
- Think about the skills you will need to use (e.g. cutting, assembling sticking) and the tools that you will need for them (e.g. scissors, glue).


Joining

Remember your joining techniques. This will make your structure strong!



Evaluating

- How well does your structure work? -Remember your purpose – does it work?
- How did you make your structure stable? How could you make it more stable?
- How did you make your structure strong and rigid?



Health and Safety

-Remove any jewellery and tie back long hair.

-Walk safely and calmly around the classroom

Keep your work area and floor area clear.

Follow the teacher's instructions carefully.

Make sure that you are wearing the correct equipment for tasks.

If you need to move around with scissors, hold around the closed blades, facing down.

Report all spillages & clean up properly after yourself.