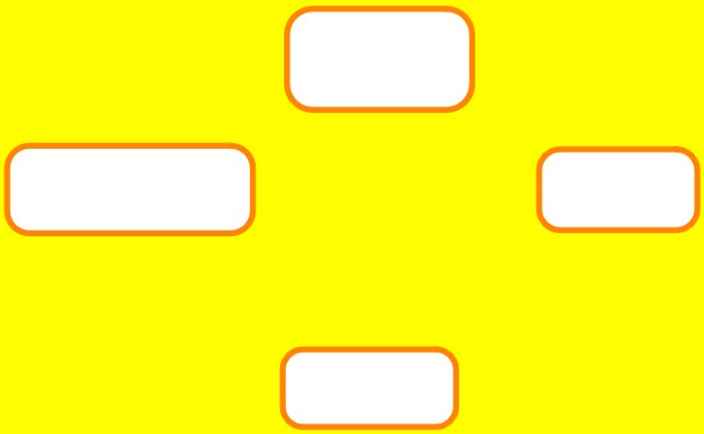
Lesson 2

WALT plan how to build a strong structure.

What features did we look at last lesson?



Answers

WALT plan how to build a strong structure.

What features did we look at last lesson?

Size

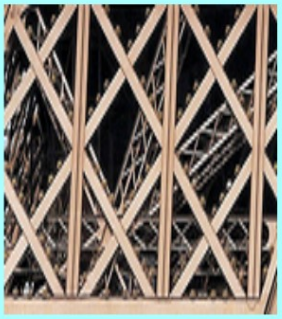
Structure

Built

Shape

What shapes can we see?

Why would using this shape make it a strong structure?

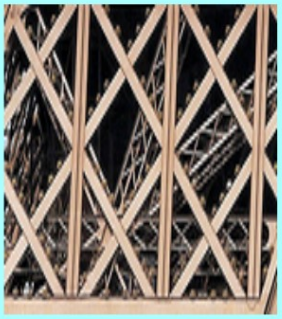


Answers

What shapes can we see? Triangles

Why would using this shape make it a strong structure?

The triangle is the strongest shape when building due to it having a strong base and rigid sides which allows them to hold alot of weight.



Today we will plan how to build a strong structure.

Tower

Design specification

Your tower must:

- **only be made from 12 straws and masking tape**
- **be 20cm or taller**
- **be able to hold a weight (a pair of scissors)**

You will only have 25minutes to complete the task!

Before you start to build you will need a plan!

Before we start building what do we need to do?

Discuss our design ideas first.

Think about:
How many different ways can you join the straws?

Which might be the strongest join?

Make notes and sketches to show how you plan to build your tower.

Use a ruler and a pencil to draw your sketches!

Y3 We Are Engineers: Tower Making —Knowledge Organiser

Key Knowledge

Learn this information

What is a tower?

Any structure that is relatively tall in proportion to the dimensions of its base. It may be either freestanding or attached to a building or wall.

Towers were an important feature of the churches and cathedrals built during the **Romanesque** and **Gothic** periods. Some Gothic church towers were designed to carry a spire, while others had flat roofs.

The use of **steel** frames enabled buildings to reach unprecedented heights in the late 19th and 20th centuries; the **Eiffel Tower** (1889) in Paris (see photo) was the first structure to reveal the true vertical potential of steel construction.

5 Most Famous Towers in the world:

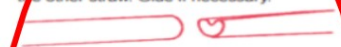
1. Eiffel Tower— 1889 —France (Paris) - 324m.
2. Leaning Tower of Pisa— 1372—Italy (Pisa) - 55.86m. *It took a whopping 199 years to build!*
3. CN Tower— 1976 — Canada (Toronto) - 553m.
4. Big Ben— 1859 — England (London) - 96m. *is considered a masterpiece of Gothic Revival architecture.*
5. Sky Tower—1994 — New Zealand—328m.

Key Skills

Practise and perform these skills

Straight Joining:

1. The end of one straw is creased and inserted into the other straw. Glue if necessary.



2. Ends flattened and glued.

3. Sleeve made from straw. Glue if necessary.

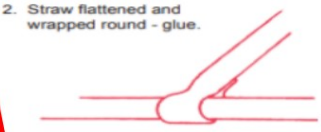
NOTE: It is possible to repair a buckled member of a structure by using method 3.

4. Pipecleaner insert.

Angled Joins:

1. Flattened and angled - glue.

2. Straw flattened and wrapped round - glue.



3. Straw split and fitted around - glue.

Key Vocabulary

Understand these key words

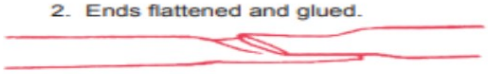
Word	Definition
Frame	A basic structure that underlies or supports a structure.
Spire	Steeply pointed usually with a pyramid base.
Vertical	A vertical line is a line that runs up and down the page.
Horizontal	A horizontal line is a line that runs right and left across the page.
Roof	The structure forming the upper covering of a building or vehicle.
Base	The lowest part or edge of something, especially the part on which it rests or is supported.
Height	The measurement of someone or something from head to foot or from base to top.
Diameter	A transverse (extending across) measurement of something; width or thickness.
Strengthen	Make or become stronger.
Stiffen	Make or become stiff or rigid.
Reinforce	Strengthen or support (an object or substance), especially with additional material.
Stricture	A building or other object constructed from several parts.
Joining	Link; connect.
Romanesque	Romanesque architecture is a term that describes the style of architecture which was used in Europe from the late 10th century until the 12th century when it changed to the Gothic style.
Gothic	Gothic architecture (or pointed architecture) is an architectural style that was particularly popular in Europe from the late 12th century to the 16th century, during the High and Late Middle Ages, surviving into the 17th and 18th centuries in some areas.
Steel	A hard, strong grey or bluish-grey alloy of iron with carbon and usually other elements, used as a structural and fabricating material.

This information may help you decide which joins you would like to use.

Straight Joining

1. The end of one straw is creased and inserted into the other straw. Glue if necessary.

2. Ends flattened and glued.



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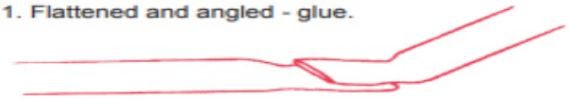
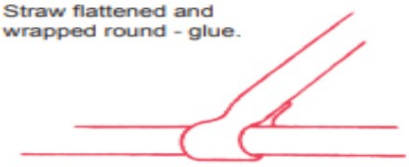
Angled Joins

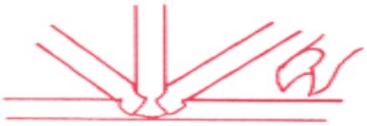
1. Flattened and angled - glue.



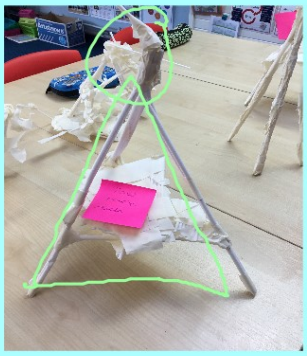
2. Straw flattened and wrapped round - glue.

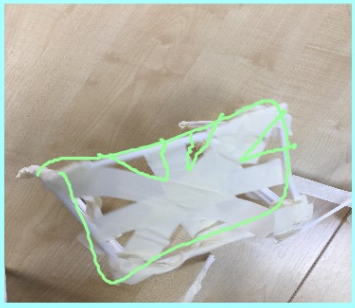


3. Straw split and fitted around - glue.

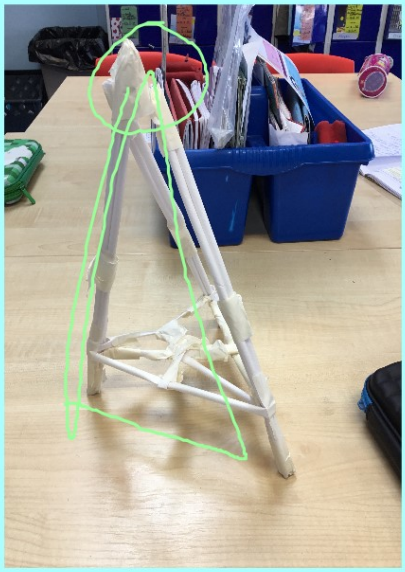


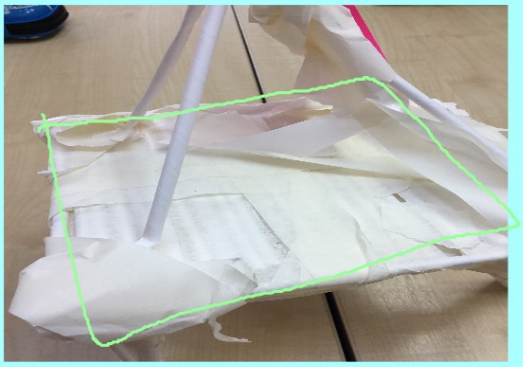
Maybe you could try making some before you choose!





Maybe these will help you to decide?



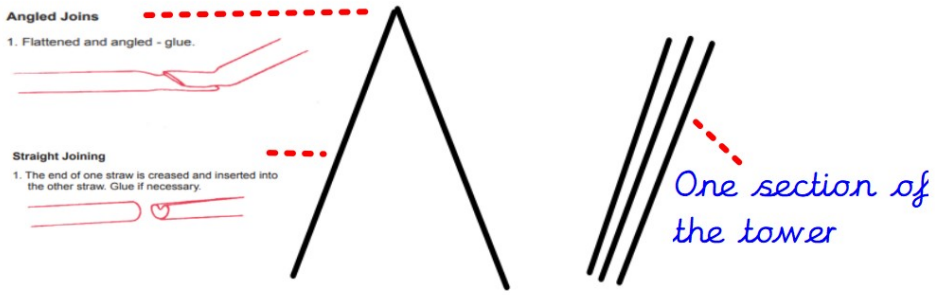


Once you have an idea complete your plan

Date:

WALT: plan and build a strong structure.

This is what our tower will look like:



One section of the tower

This is how it will be made:

I will build a structure in the shape of a triangle because it will be very strong at the base and in each section.
I will use an angled join at the top and bend it over to create the point, I believe this will hold in place better than the other choices.
Straight joins will link two straws together to create height.

Here is an example for you to refer to when completing your own plan.

We will build this during our next lesson.