Lesson 1

WALT: investigate how existing towers have been designed and built.

Let's find out about some different **towers**.

Firstly, what is a <u>tower</u>?

Answer

WALT: investigate how existing towers have been designed and built.

Let's find out about some different **towers**.

Firstly, what is a tower?

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.

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:

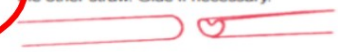
1. Eiffel Tower— 1889 —France (Paris) - 324m.
2. Leaning Tower of Pisa— 1372—Italy (Pisa) - 55.86m. *It took a whopping 199 years to build!*
3. CN Tower— 1976 — Canada (Toronto) - 553m.
4. Big Ben— 1859 — England (London) - 96m. *is considered a masterpiece of Gothic Revival architecture.*
5. Sky Tower—1994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

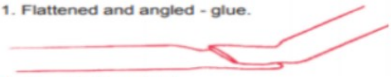
3. Sleeve made from straw. Glue if necessary.

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

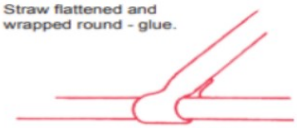
4. Pipecleaner insert.

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.

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.

steeply pointed usually with a pyramid base

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

Check out the tallest towers in the world!

Look at where the Eiffel Tower is at a whopping 1,063ft high (or 324m)

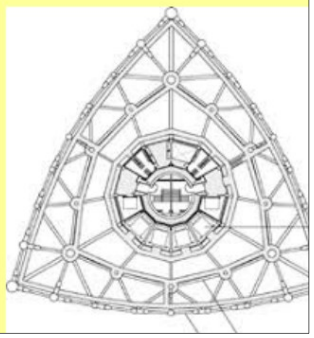
Rank	Name	Pinnacle height	Year	Structure	Country	City	Remarks
1	Tokyo Skytree	634 m (2,080 ft)	2012	Steel	Japan	Tokyo	Became tallest tower in 2011, second-tallest freestanding structure in the world
2	Canton Tower	604 m (1,982 ft)	2010	Steel & concrete	China	Guangzhou	Tallest in the world 2009–11
3	CN Tower	553.33 m (1,815.4 ft)	1976	Concrete	Canada	Toronto	Tallest freestanding structure in the world 1975–2007, tallest in the western hemisphere
4	Ostankino Tower	540.1 m (1,772 ft)	1967	Concrete	Russia	Moscow	Tallest freestanding structure in the world, 1967–75, tallest in Europe
5	Oriental Pearl Tower	468 m (1,535 ft)	1994	Concrete	China	Shanghai	Tallest in China 1994–2007
6	Milad Tower	435 m (1,427 ft)	2007	Concrete	Iran	Tehran	Tallest in the Middle East
7	KL Tower	421 m (1,381 ft)	1994	Concrete	Malaysia	Kuala Lumpur	Tallest in South East Asia
8	Tianjin Radio and Television Tower	415.2 m (1,362 ft)	1991	Concrete	China	Tianjin	Tallest in Asia 1991-1994，Tallest in North China
9	Central Radio and TV Tower	405 m (1,329 ft)	1992	Concrete	China	Beijing	
10	Zhongyuan Tower	388 m (1,273 ft)	2011	Steel	China	Zhengzhou	
11	Kiev TV Tower	385 m (1,263 ft)	1973	Steel	Ukraine	Kiev	
12	Tashkent Tower	374.9 m (1,230 ft)	1985	Steel	Uzbekistan	Tashkent	Tallest in Central Asia
13	Liberation Tower	372 m (1,220 ft)	1996	Concrete	Kuwait	Kuwait City	
14	Almaty Tower	371.5 m (1,219 ft)	1983	Steel	Kazakhstan	Almaty	
15	Riga Radio and TV Tower	368.5 m (1,209 ft)	1986	Steel	Latvia	Riga	Tallest in the European Union
16	Berliner Fernsehturm	368 m (1,207 ft)	1969	Concrete	Germany	Berlin	Tallest structure in Germany
17	Stratosphere Tower	350.2 m (1,149 ft)	1996	Concrete	United States	Las Vegas	Tallest observation tower in the United States
18	Lotus Tower	350 m (1,150 ft)	2018	Concrete	Sri Lanka	Colombo	Tallest structure in South Asia
19	West Pearl Tower	339 m (1,112 ft)	2004	Concrete	China	Chengdu	
20	Macau Tower	338 m (1,109 ft)	2001	Concrete	China	Macau	
21	Dragon Tower	336 m (1,102 ft)	2000	Lattice	China	Harbin	
22	Europaturm	337.5 m (1,107 ft)	1979	Concrete	Germany	Frankfurt	
23	Tokyo Tower	332.6 m (1,091 ft)	1958	Steel Lattice	Japan	Tokyo	Tallest in the world 1958–67
24	Emley Moor TV Tower	330.4 m (1,084 ft)	1971	Concrete	United Kingdom	Kirklees	Tallest freestanding structure in the United Kingdom
25	Sky Tower (Auckland)	328 m (1,076 ft)	1997	Concrete	New Zealand	Auckland	Tallest freestanding structure in the Southern Hemisphere
26	Vilnius TV Tower	327 m (1,073 ft)	1980	Concrete	Lithuania	Vilnius	
27	Saint Petersburg TV Tower	326 m (1,070 ft)	1962	Lattice	Russia	Saint Petersburg	
28	Eiffel Tower	324 m (1,063 ft)	1889	Steel Lattice	France	Paris	First to surpass 300 metres, tallest tower in the world 1889–1958, oldest in this list

Tokyo Skytree is a broadcasting, restaurant, and observation tower in Sumida, Tokyo, Japan.

It became the tallest structure in Japan in 2010 and reached its full height of 634.0 metres (2,080 ft) in March 2011, making it the tallest tower in the world.

What do we notice about this tower?

What shape base does it have?



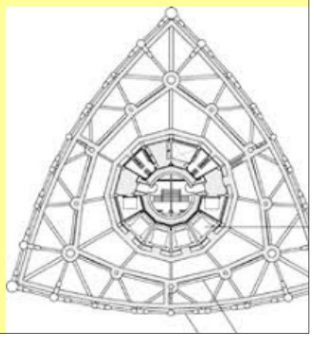
Answers / Suggestions

What do we notice about this tower?

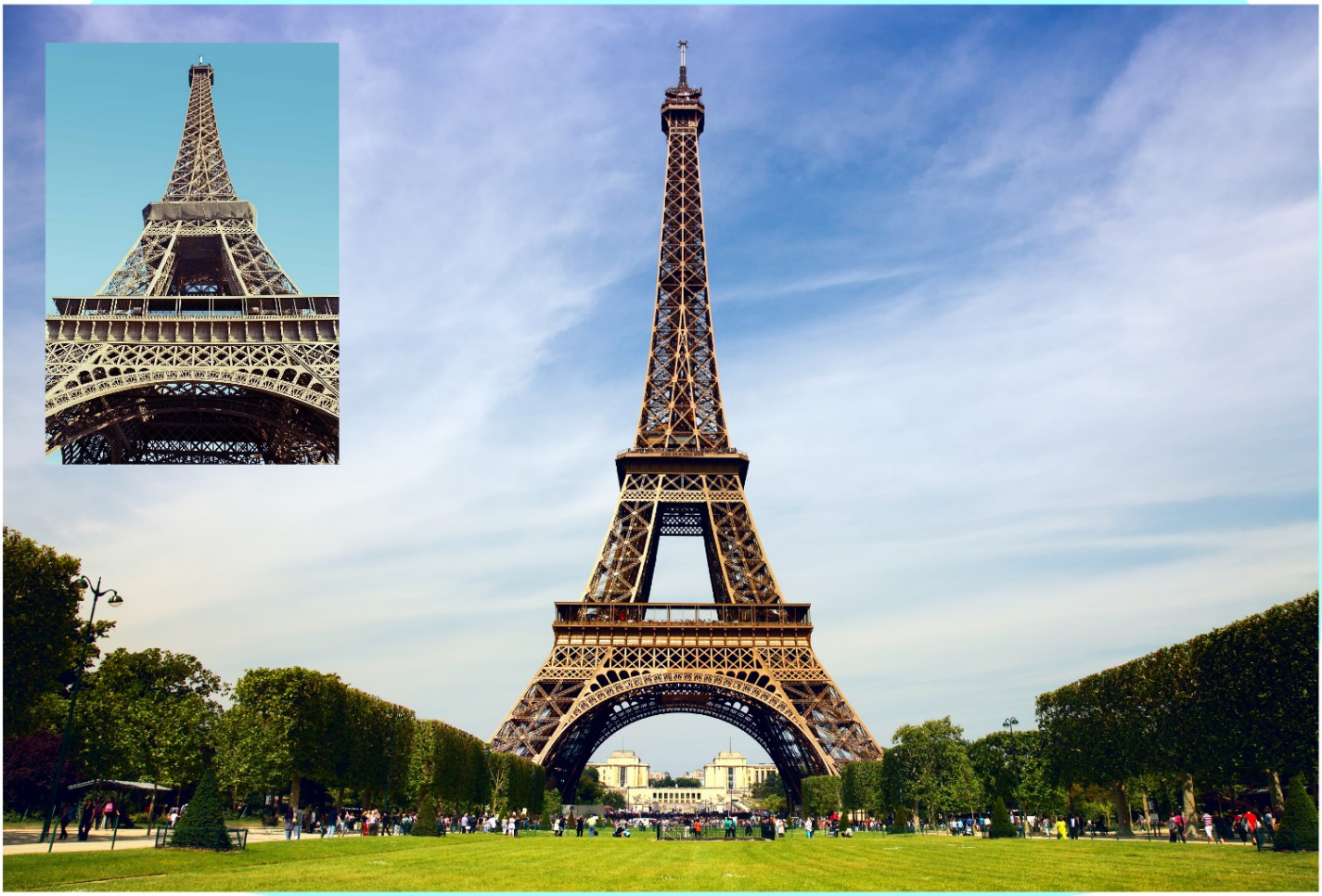
The steel structure has a criss crossed design
The thickness of the steel poles
There is an inner section to the tower

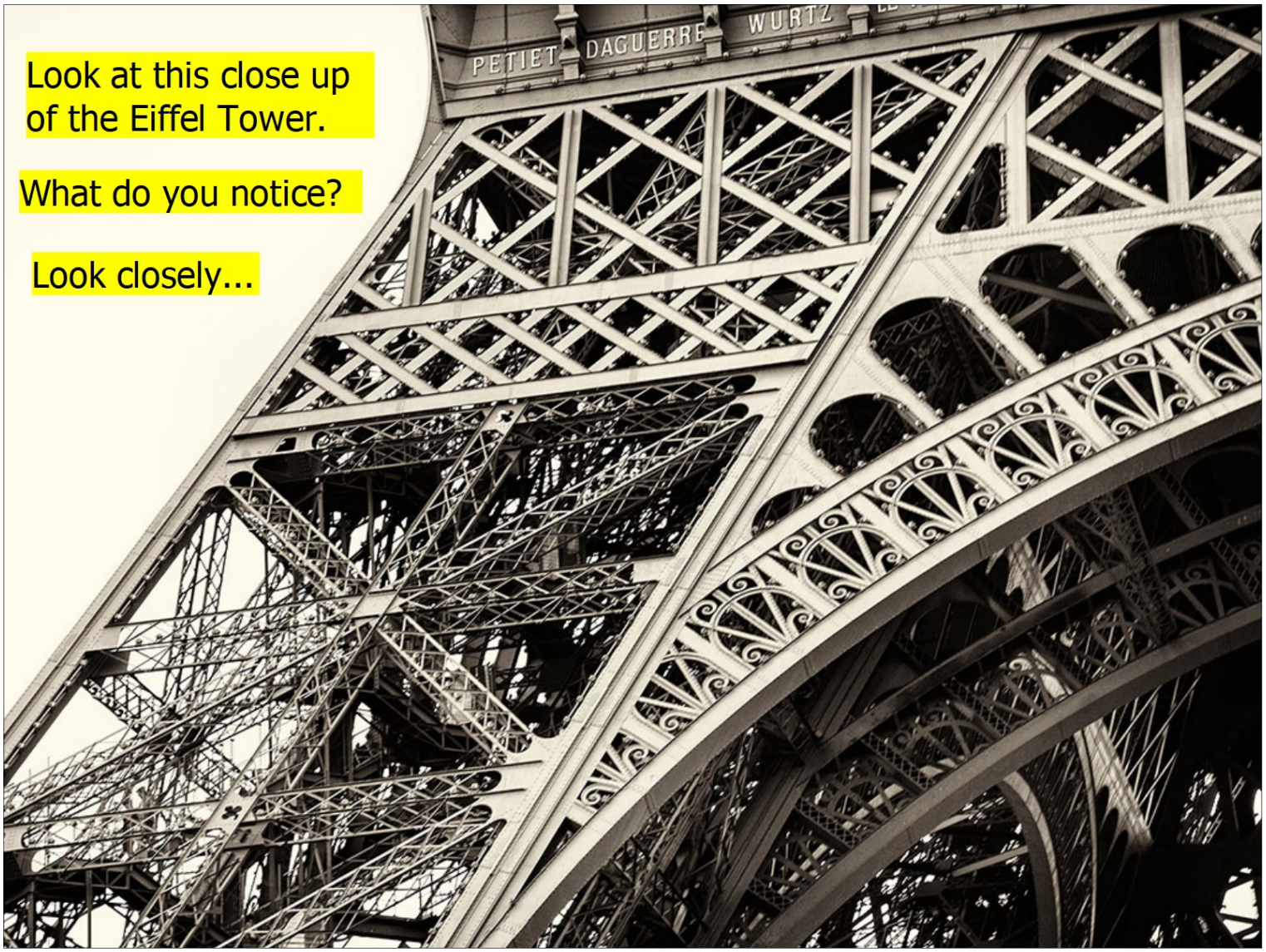
What shape base does it have?

Triangular



WALT: investigate how existing towers have been designed and built.





Look at this close up of the Eiffel Tower.

What do you notice?

Look closely...

You will need an ipad/ computer

Activity: Research the following towers.

1. Wireless communications tower
2. Blackpool tower (England)
3. Tokyo tower (Japan)
4. Löbau tower (Germany)
5. Electrical transmissions tower

Look carefully at their different structures.

Sketch any joins that you think could be useful to you.

WALT: investigate how existing towers have been built and looking for any similarities:

Images

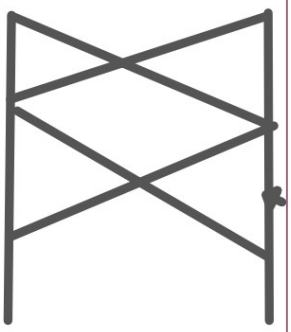

Blackpool Tower

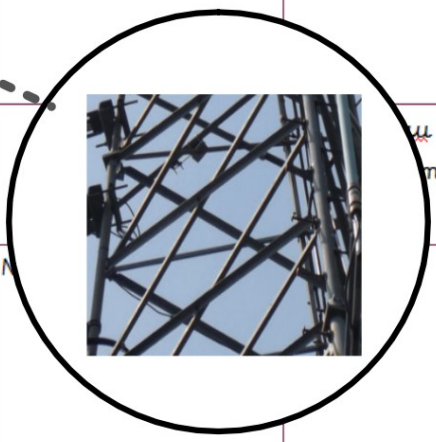

Electrical Transmissions Tower


Tokyo Tower

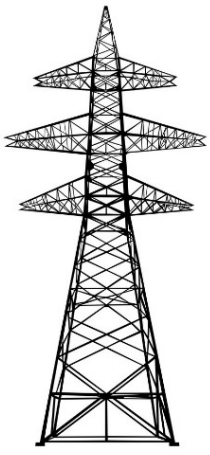
There is a resource sheet if you need one!

Sketch useful joins - not the whole tower!

Sketch useful joins: 	Sketch useful joins:	Sketch useful joins:	Sketch useful joins:	Sketch useful joins:
Wireless communications tower	Blackpool tower (England)		u tower many)	Electrical transmissions tower
Notes: Criss-cross pattern to make the joins strong in the middle.	Notes:	N		Notes:



Which one is which?



What do you notice about the structures?
Were there any similarities?

Which one is which?

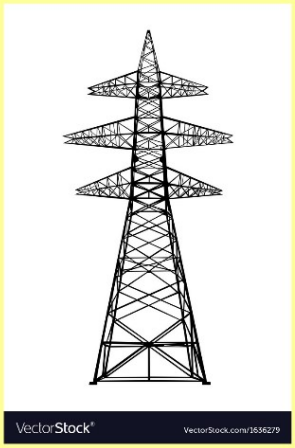
Answers

Blackpool Tower

Lobau Tower

Wireless Communications Tower

Tokyo Tower



Electrical Transmissions Tower