

KS2



Self-guided visit resources

**Thank you for booking a visit to
Tower Bridge, we hope you enjoy your visit.**

This pack contains information and activity ideas for you to do with your class during your visit. We also recommend that group leaders visit Tower Bridge in advance of bringing their school group so they can familiarise themselves with the Bridge content and layout. We can provide a complimentary ticket to facilitate this.

Background information

Tower Bridge first opened in 1894 and is an unusual bridge because it allows people to cross the River Thames but also opens to let tall ships travel up and down the river.

This unusual design came about because of 2 issues. In the 1880s, London was the largest city in the world and was extremely congested, so a new bridge was needed to help ease the road traffic. At the same time the Pool of London (the area around Tower Bridge) was a busy port, receiving goods from all over the world. A normal, low level bridge would have meant that the ships bringing in goods would not have been able to reach the warehouses and a different type of bridge was needed.

Tower Bridge is a bascule bridge, which means the road opens to let tall ships pass. The word bascule comes from the French word for balance or seesaw, as the 2 sides of the bridge move like a seesaw.

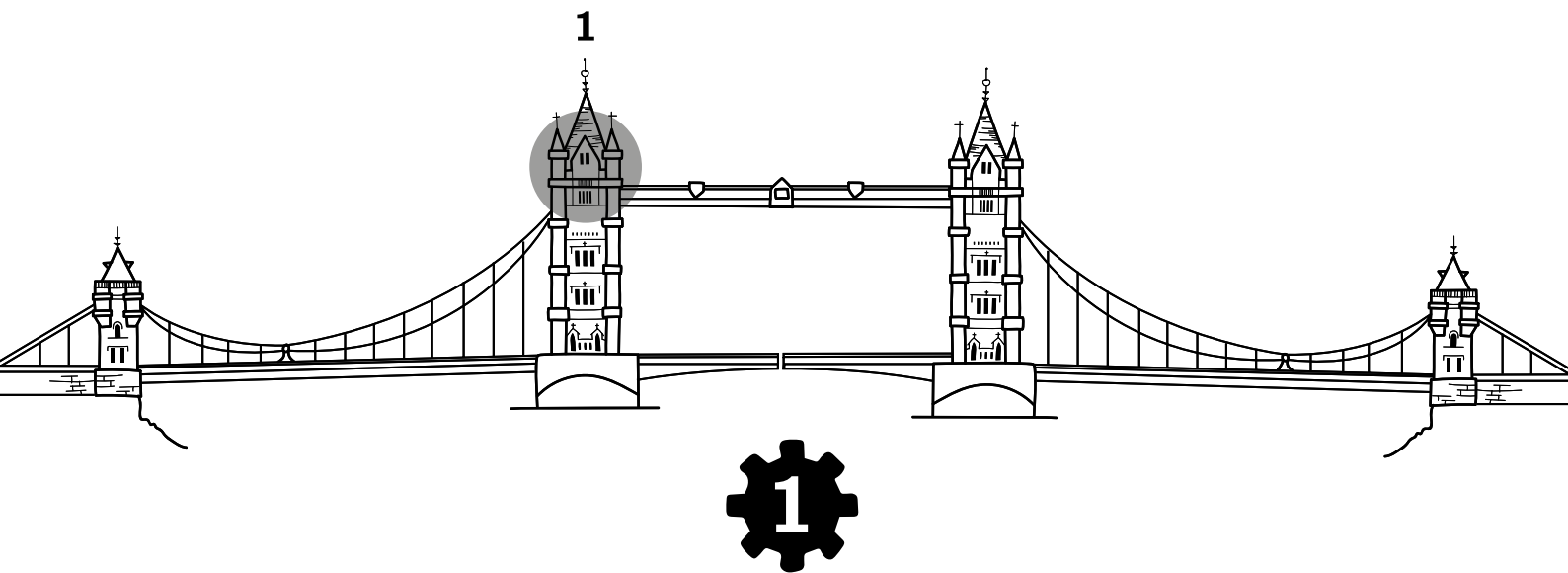
Tower Bridge was designed by the architect Sir Horace Jones and then his design was improved by

the engineer Sir John Wolfe Barry. Tower Bridge gets its name from its location next to the Tower of London, rather than from the towers on the bridge itself. The Tower of London also influenced the design of Tower Bridge, as there was some concern that a modern Victorian bridge would look out of place next to the castle next door. To solve this, it was decided that the bridge should be faced in stone to match the Tower of London – it's not until you're inside Tower Bridge that you see the brick and metal which makes up the structural skeleton.

The bridge took 8 years to build and, in total, c.800 people were involved in its construction.

The high level walkways were originally opened to the public so that pedestrians could cross the river even when the bridge was open for a passing boat. They found, however, that the bridge opened and closed so quickly that pedestrians tended to wait on the road with the rest of the traffic. This lack of use meant that the high level walkways were closed to the public in 1910 and then were inaccessible until 1982 when the visitor attraction opened. The glass floor was installed in 2014.

Tower Bridge still opens for boats today, on average 3 times a day, and 40,000 people cross using the road each day. There is no charge to open Tower Bridge for a boat, you just need to be tall enough to require it. All bridge lift dates and times are published on our [website](#) and so it's worth having a look to see if there is a bridge lift happening on the day of your visit.



The North Tower

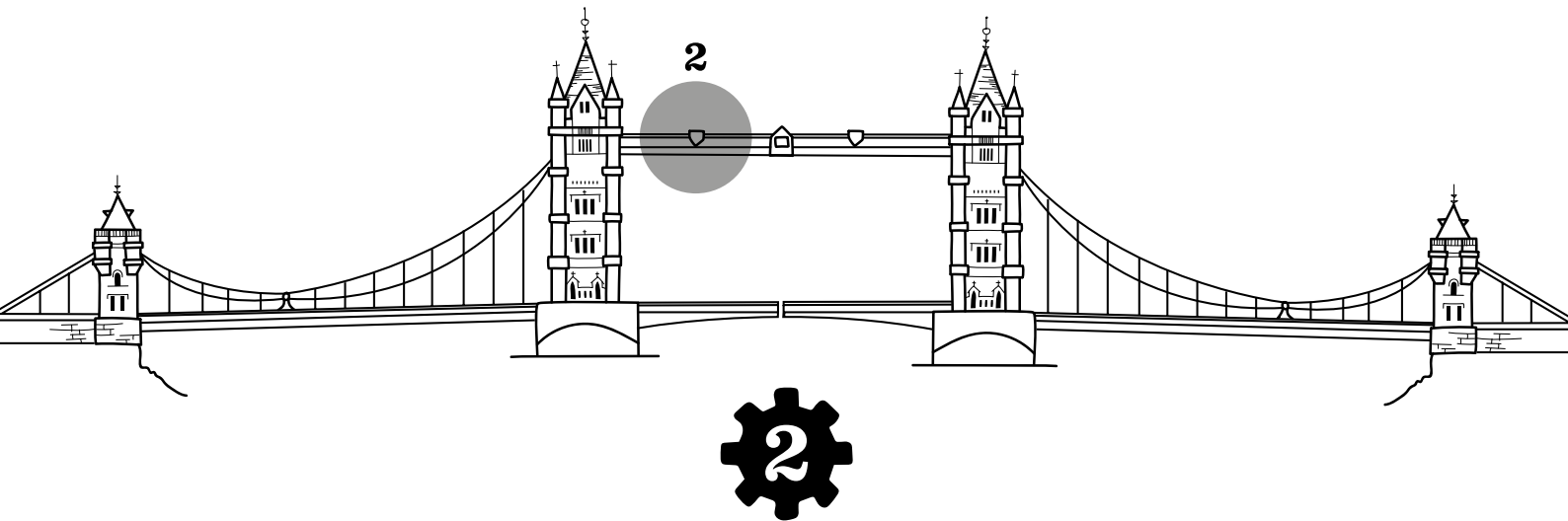
The North Tower is at the top of the lift or stairs and is the first part of your visit.

Key features

- The film shows life in Victorian London at the time when Tower Bridge was being built.
- The goods around the film screen show some of the types of cargo which were coming into the Pool of London on ships and through Tower Bridge.
- The blinds covering the windows show some of the construction workers building Tower Bridge.
- Above the film are portraits of the 4 principle men involved in Tower Bridge's design and construction. Sir Horace Jones (Tower Bridge's architect), Sir William Arrol (structural steel manufacturer), Lord William Armstrong (engineer and inventor) and Sir John Wolfe Barry, (principle engineer who oversaw the building of Tower Bridge).
- The brick walls and metal frames you can see form the main structure of Tower Bridge.
- The brown colour of the metal is the original colour of all the metalwork on Tower Bridge. Tower Bridge was repainted red, white and blue in 1977 to mark the Queen's Jubilee.

Discussion ideas

- 1 **What can you see?**
- 2 **Looking at the video**
Can you see anything you would see around London today?
What wouldn't you find in London today?



East Walkway

**This walkway gives you a great view over the east of London but the west walkway has more recognisable buildings so you may want to spend more time there!
The west walkway also has another glass floor which tends to be quieter.**

Key features

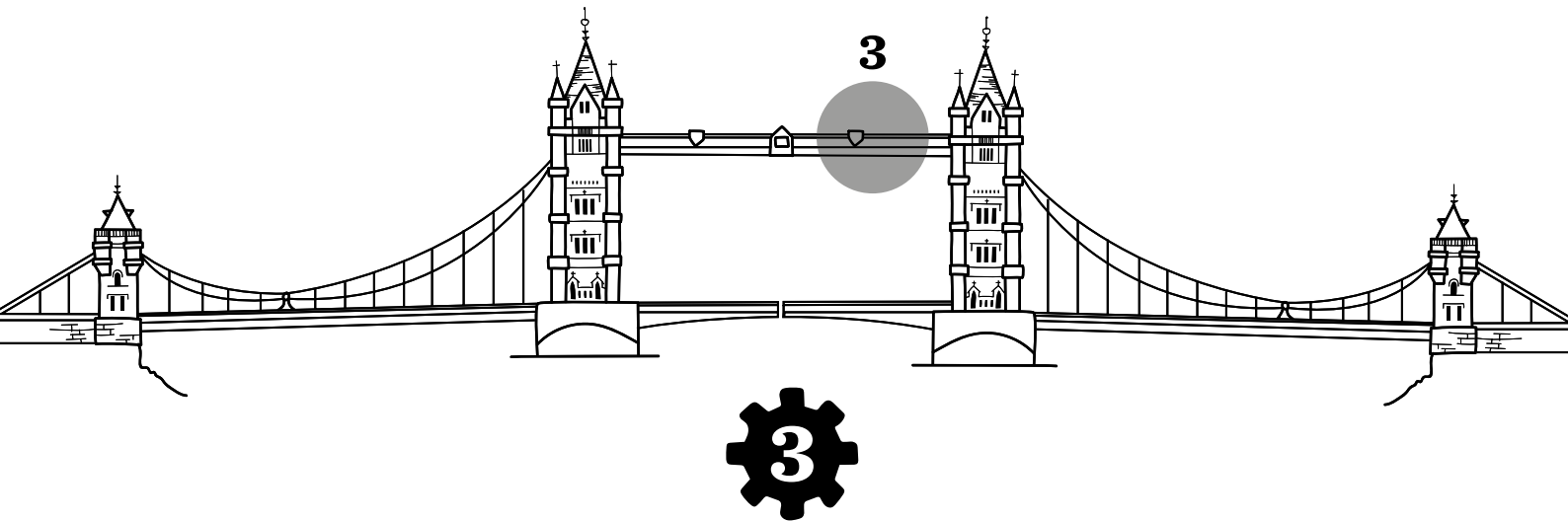
- A great view over the east of London towards Canary Wharf.
- Views of tall sailing ships (usually moored up) which would need Tower Bridge to open in order to pass underneath.
- Victorian warehouses which would have stored goods like the ones in the North Tower.

Discussion ideas

- 1** What famous buildings can you see?
- 2** Can you see any other bridges out of this window?

No! Tower Bridge is most easterly bridge in central London

- 3** Can you see any boats? Which ones would we need to open Tower Bridge for?



West Walkway

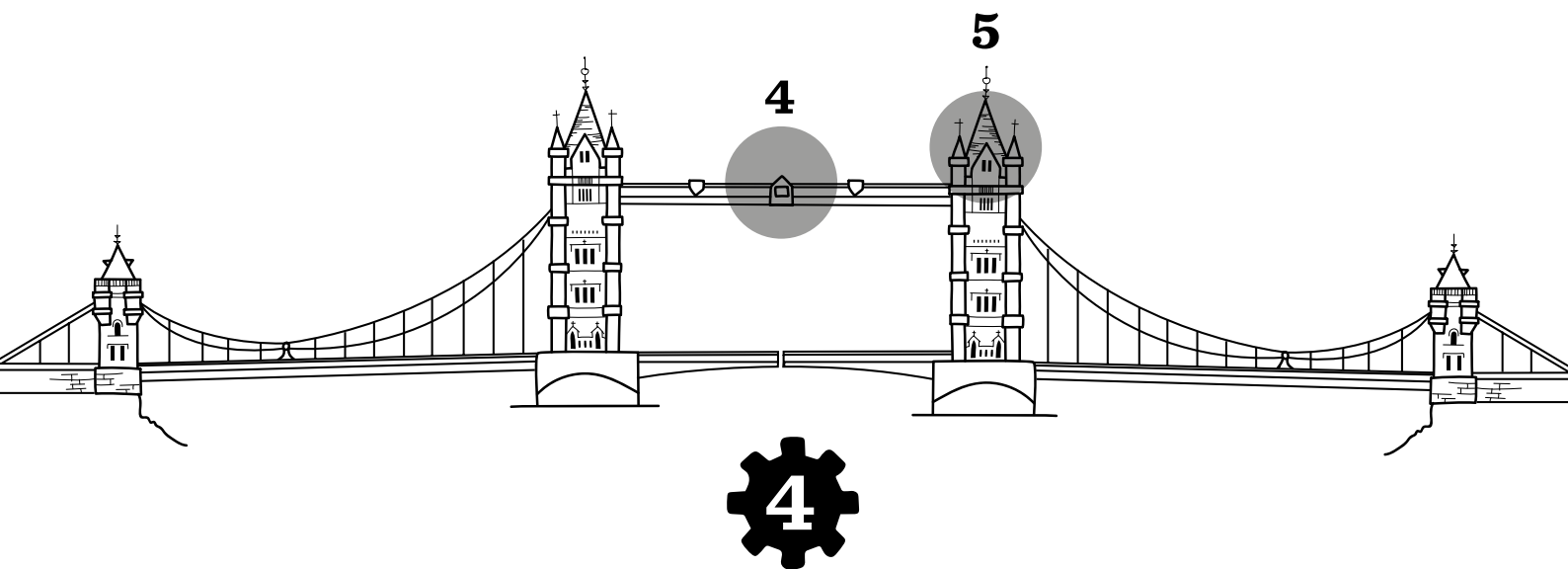
This walkway gives great views over West London

Key features

- Views of many famous buildings including the Shard, City Hall, BT Tower, St Paul's Cathedral, the Monument, the Walkie Talkie, the Gherkin, the Cheesegrater, Tower of London, HMS Belfast.
- Views of London Bridge (the next bridge along from Tower Bridge).
- A good place to discuss the changing London skyline (see activity sheet).
- A second glass floor.

Discussion ideas

- 1** What famous buildings can you see?
- 2** Do you think they are old or new?
- 3** Can you see many buildings made from wood? What do you think happened to them (destroyed in the Great Fire of London)?
- 4** How many bridges can you see?



Glass Floor

Key features

- The glass floor is directly over the part of the bridge which opens (the bascules) and you can see the gap between the 2 bascules cutting across the road at the centre of the bridge.
- The glass floor is very strong and can take the combined weight of 2 taxis and an elephant.
- If you time it right you can watch the bridge opening from the glass floor, it can get busy though!

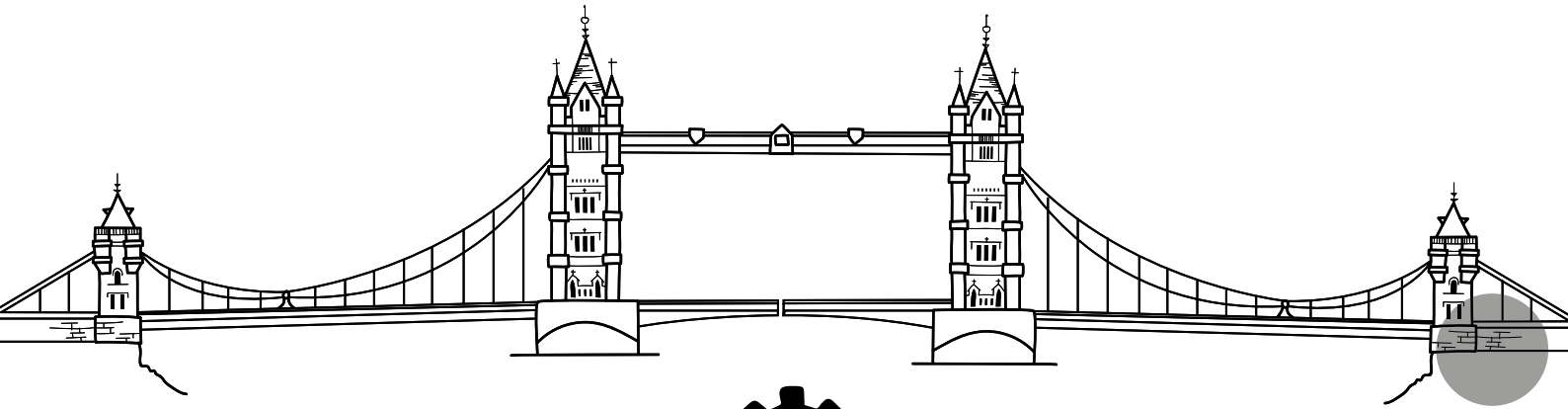


South Tower

You can either spend time in the South Tower between visiting the walkways or at the end before going to the Engine Rooms.

Key features

- A film showing the different people who worked at Tower Bridge.
- Access to the Engine Rooms and toilets (larger toilets available in the Engine Rooms).



The Engine Rooms

Key features

- These are the original Victorian Engines of Tower Bridge and were used to power the Bridge until 1976 (we now use electricity and oil hydraulics). Inside you will see how they worked.
- Generating the power needed to open Tower Bridge can be broken down into **5** stages. Each stage is numbered as you walk through the Engine Rooms.

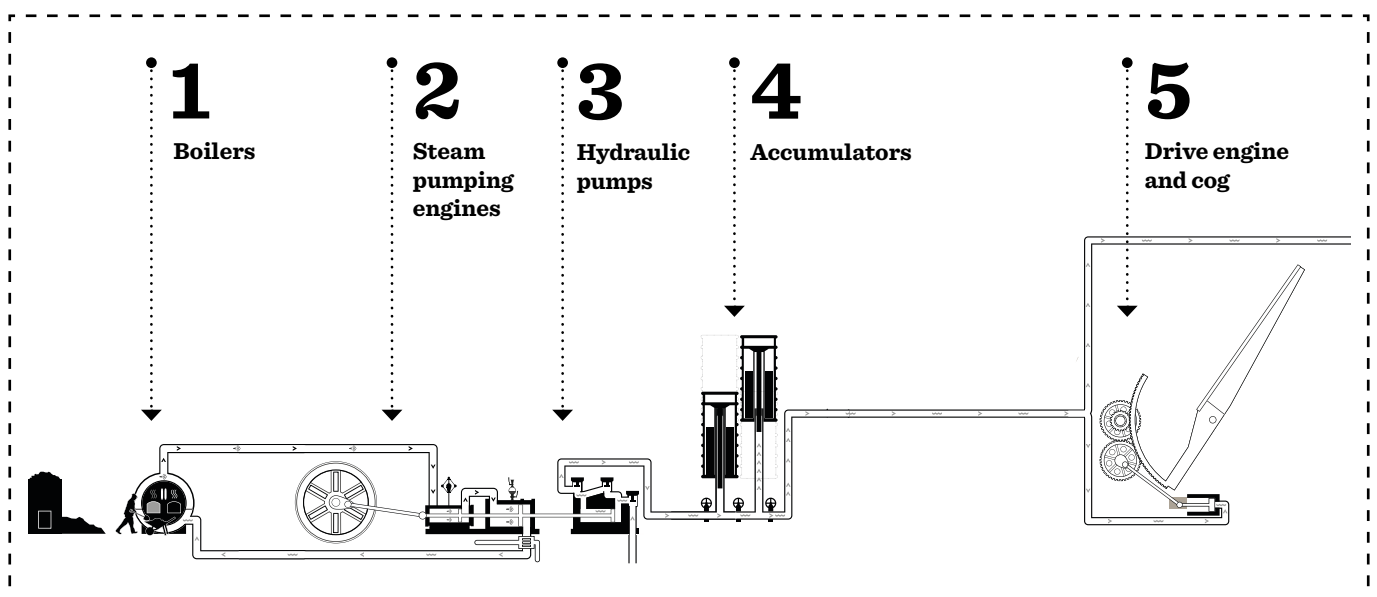
Stage 1 Boilers

Stage 2 Steam pumping engines

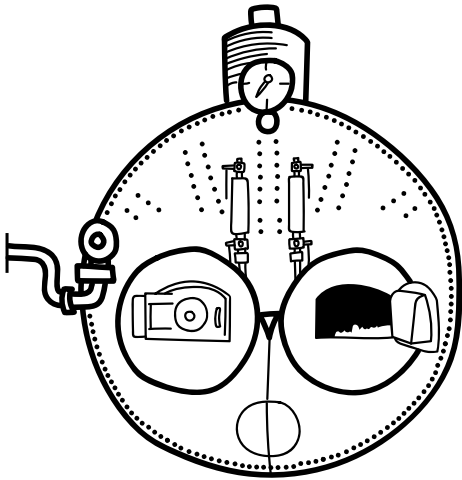
Stage 3 Hydraulic pumps

Stage 4 Accumulators

Stage 5 Drive engine and cog



1 Boilers



These created steam by burning coal and boiling the water. Each boiler has 2 fires and these fires were burning 24 hours a day.

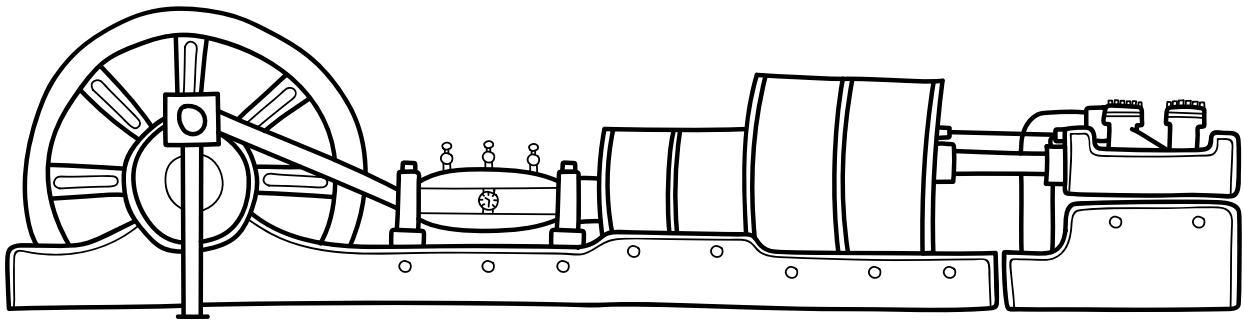
Key features

- The 2 glass tubes on the front would show the stokers how much water was in the boilers, so they could make sure it didn't run dry.
- The gauge at the top measures the pressure inside the boilers.

Discussion ideas

- ⚙️ What can you see?
- ⚙️ What do you think this room would be like when all the fires were burning?

2 + 3 Steam pumping engine and hydraulic pumps



These machines used the steam from the boilers to power a water pump which you can see when you reach the other end of the engine.

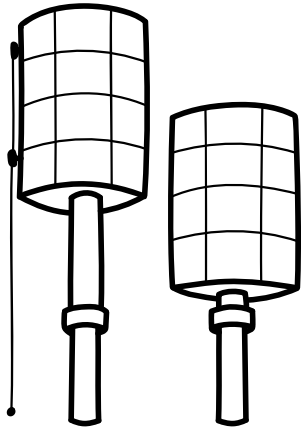
Discussion ideas

- ⚙️ What can you see?
- ⚙️ Do you think the machines have always been this colour? What colours are engines normally?

Key features

- When the big wheel turns, it makes 2 smaller wheels turn which then power a set of pistons. If your pupils play Minecraft, they may already know what a piston is.
- The oil jars on the engine are filled with oil to stop friction being generated by the moving parts.
- The green, red, white and black colours of the machine were chosen by the designer, Lord William Armstrong, as these were the colours on his family crest.

4 Accumulators



These accumulators stored pressurised water and were filled with water by the water pump on the steam pumping engine.

Key features

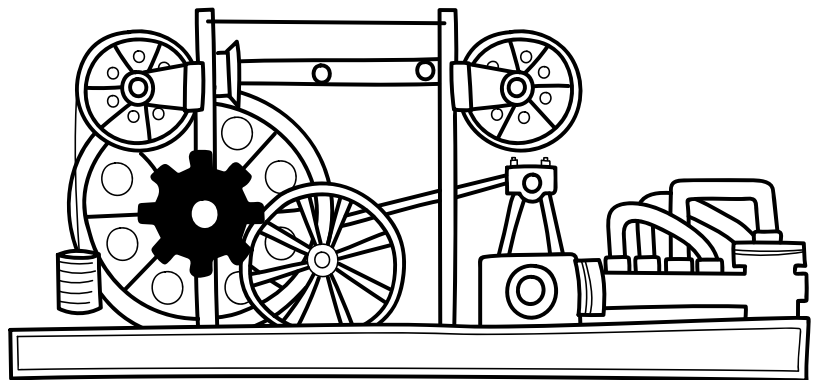
- The accumulators rise and fall depending on the amount of water inside them, when they're up high they are filled with water, down low they are empty.
- To open the bridge, the accumulators would be released, letting out the pressurised water, which then powered the drive engine.

Discussion ideas

- 1 **What can you see?**
- 2 **How do you think these might move?**

5 Drive engine

The water would be forced down the pipes of the drive engine by the weight of the accumulator dropping which would turn the cog at the end.



Key features

- The cog which, when it turned, would make the bridge open.
- This drive engine is currently in the wrong place, it needs to be up in inside the bridge to be able to open the bridge.
- We still use a cog to open Tower Bridge today.

Discussion ideas

Looking at the cog

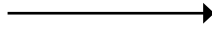
- 1 **Do you know what this is? (Students may call it a gear – they are the same thing!)**
- 2 **Where else do you find these?**

Answers

Worksheet The North Tower



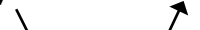
Sir Horace Jones
Architect



A person who **designs buildings and bridges**. This person designed **Tower Bridge**.



Sir John Wolfe Barry
Civil Engineer



A person who **makes and builds bridges**. This person made the metal structure of **Tower Bridge**.



Lord William Armstrong
Engineer and inventor



A person who **invents and makes engines**. This person designed the Victorian engines which used to open **Tower Bridge**.



Sir William Arrol
Bridge manufacturer



A person who **designs and builds engines and big structures like bridges**. This person helped to design **Tower Bridge**.

Worksheet The Glass Floor

Pupils can do a tally of the different bridge users they see. We suggest spending 5 minutes (maybe set a timer on your phone?) but you can spend as long or as little as you want. Please try to keep your group to one side, so other visitors can still walk across the floor.

Worksheet The Engine Rooms

1. Steam
2. Wheel
3. Pump
4. Accumulator

Worksheet West Walkway

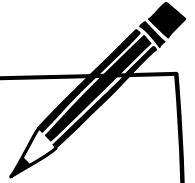
Pupils can pick any building to draw, if you have difficulty naming them then the member of staff by the glass floor will be able to help you.

Tower Bridge is made from stone on the outside but brick and metal on the inside (which you can see in the North and South Towers). The brick and metal on the inside is like a skeleton – it's the strong part which holds the bridge up. The stone on the outside is just for decoration, to make Tower Bridge look older than it is and blend in with the Tower of London next door.

Name _____

Worksheet The North Tower

Once you get inside the Ticket Office,
go up in the lift to the top of the North Tower.



Tower Bridge is an old bridge. It was first opened in 1894 which means it's a Victorian Bridge. Look at the black and white film in front of you and imagine you've gone back to Victorian London when these videos were made. Circle the words which describe what it would be like. Can you think of any others?

Busy

Noisy

Smelly

Interesting

Exciting

Dirty

Boring

Relaxing

Quiet

Above the film are 4 paintings of the people who designed Tower Bridge. Can you match their jobs with the description?



Sir Horace Jones
Architect

A person who **designs buildings and bridges**. This person designed **Tower Bridge**.



Sir John Wolfe Barry
Civil Engineer

A person who **makes and builds bridges**. This person made the metal structure of **Tower Bridge**.



Lord William Armstrong
Engineer and inventor

A person who **invents and makes engines**. This person designed the Victorian engines which used to open **Tower Bridge**.







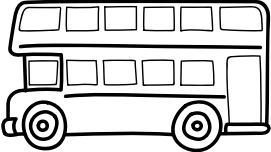
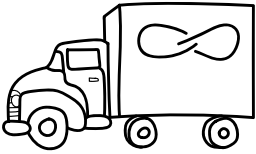

Sir William Arrol
Bridge manufacturer

A person who **designs and builds engines and big structures like bridges**. This person helped to design **Tower Bridge**.

Name _____

Worksheet The Glass Floor

40,000 people cross Tower Bridge every day. Look through the glass floor. Can you do a survey of the number of different vehicles you can see using the bridge in 5 minutes? Use a tally to keep track of what you see.

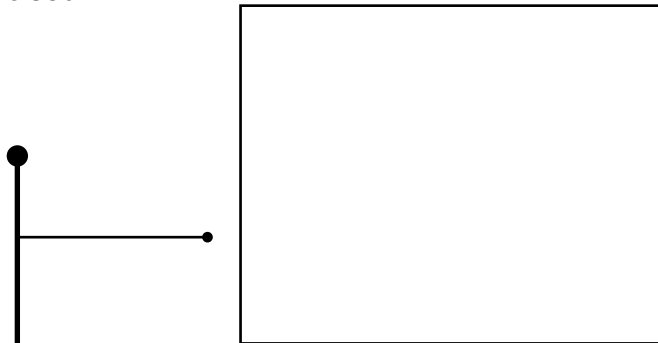
 CARS	
 CYCLISTS	
 PEDESTRIANS	
 BUSES	
 LORRIES / VANS	
 BOATS	

Name _____

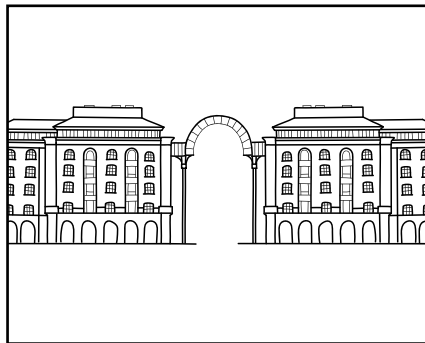
Worksheet West Walkway

This window lets you see nearly 1000 years of history, from the Tower of London (over 940 years old) to the Shard (10 years old). You can guess how old a building is by the material it is made from. Can you complete the timeline below with drawings of the buildings you can see? If you know their name then you can add that too!

Oldest

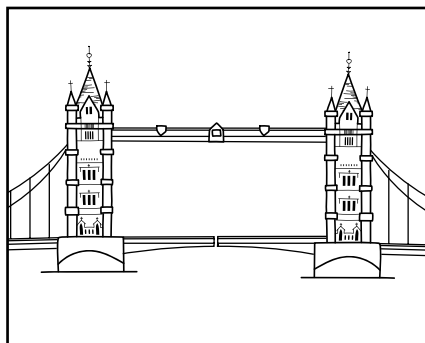


Made from stone



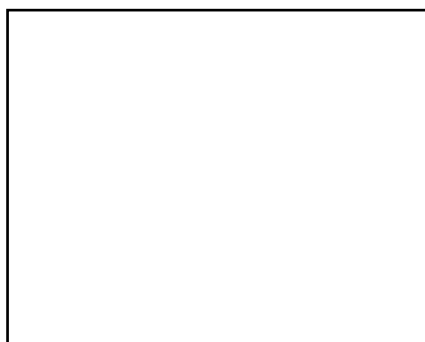
Hay's Wharf

Made from brick



Tower Bridge

Made from stone, brick and metal



Made from glass

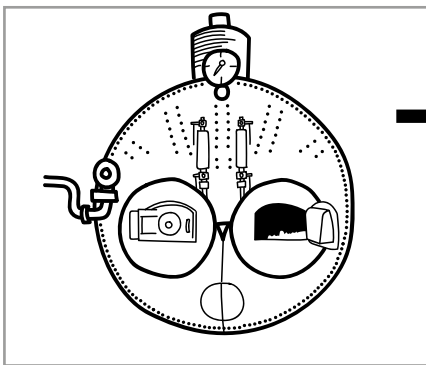
Youngest

Name _____

Worksheet The Engine Rooms

These are the engines which used to make the power needed to open Tower Bridge from when it first opened in 1894 until 1976 when it was converted to electricity and oil hydraulics. As you move through Engine Rooms, can you complete the gaps with the missing words from those below?

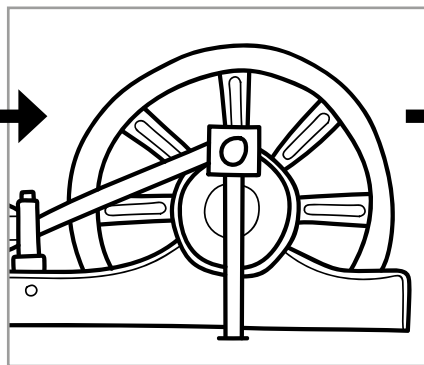
Pump Wheel Steam Accumulator



In the big boilers, coal fires boiled water to make



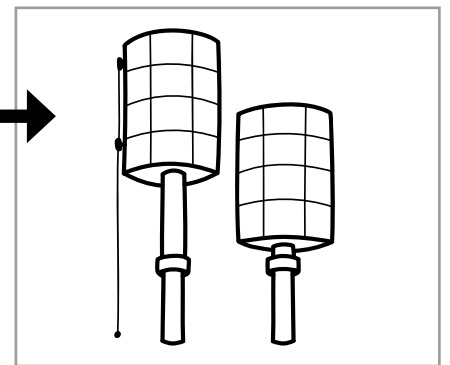
S _____



The steam turns a big

w _____

which powers a water pump



The water

p _____

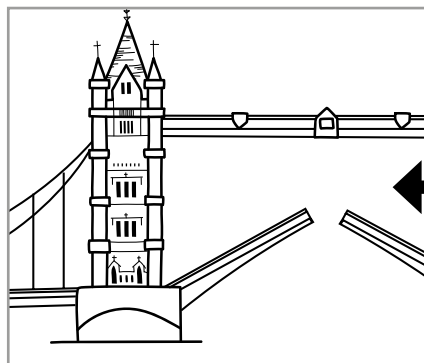
pushes the water into giant **accumulators** to be stored.

New words

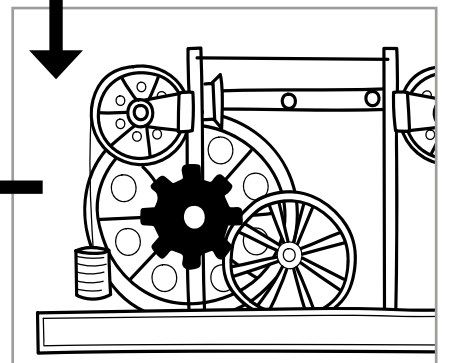
Accumulator
Where we stored the pressured water needed to open Tower Bridge.

Bascule
The road part of the bridge which moves when the bridge opens. The word is French, from their word for seesaw or balance.

Hydraulics
Using pressured liquid to make things move.



When the cog turns the **bascules** move, opening Tower Bridge.



When Tower Bridge needed to open, the water would be pushed out of the

a _____

and the pressure caused a big cog to turn. Using water to move things is called **hydraulics**.