Self-guided visit resources

This pack contains information and activity ideas for you to do with your class during your visit. We highly recommend that you visit Tower Bridge in advance of bringing your school group so you can familiarise yourself with the exhibition content and layout. We can provide a complimentary ticket to facilitate this, simply email bookings@towerbridge.org.uk.

About Tower Bridge

Tower Bridge first opened in 1894. It is an unusual bridge because it allows people to cross the Thames whilst also opening to allow tall ships to travel up and down the river.

In the 1870s, London was the largest city in the world and was extremely congested, so a new bridge was needed to ease road traffic. At the same time the Pool of London (the area around Tower Bridge) was a busy port, importing and exporting goods all over the world. A normal low level bridge would have prevented cargo ships from reaching the many wharfs (river front warehouses) along the river up to London Bridge.

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 two sides of the bridge work 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 the Bridge, as there was concern that a modern Victorian bridge would look out of place next to the Norman castle next door. So it was decided that the bridge should be faced in stone to match its neighbour – 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 eight years to build and, in total, c.800 people were involved in its construction.

The high level walkways were originally open to the public so that pedestrians could cross the river even when the bascules were raised. It was found, however, that the bridge opened and closed so quickly that pedestrians tended to wait on the road with the rest of the traffic. So, due to this lack of use the high level walkways were closed to the public in 1910. They were inaccessible until 1982 when the exhibition 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, you just need your rivercraft 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.
Key features

• The film shows life in Victorian and early Edwardian London at the time when Tower Bridge was being built and during its earliest years.

• The objects around the film screen show some of the types of cargo which were coming into the Pool of London on ships passing through Tower Bridge.

• The images covering the windows show some of the construction workers building Tower Bridge.

• Above the film are portraits of the four principal men involved in Tower Bridge’s design and construction. From left to right: 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 steel framework 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 Silver Jubilee.

Discussion ideas

1. **What can you see?**

2. **After watching the film**

   Can you see anything you would see in London today?
   What wouldn’t you see in London today?
East Walkway

This walkway gives you a great view over East 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 East London towards Canary Wharf.
• Views of tall sailing ships (usually moored up) similar to those which Tower Bridge would have frequently opened for in its early years,
• Victorian warehouses which would have stored goods like the ones shown in the North Tower (Butlers Wharf is one example).

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 Tower of London and 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 any 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?
   5 (London Bridge, Cannon Street Railway bridge, Southwark Bridge, Millennium Bridge and Blackfriars Bridge).
**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 can take the combined weight of 6 Indian elephants, so don’t worry - it’s very strong!
- 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 24 hours in the life of Tower Bridge. (At 12 noon on the film you can see a Bridge lift).
- Access to the Engine Rooms and toilets (larger toilets available in the Engine Rooms).
Key features

- These are the original Victorian Engine Rooms of Tower Bridge and were used to power the Bridge until 1976 (we now use electricity and oil hydraulics). Inside you will find out 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 to boil water. Each boiler had two fires and these fires were burning 24 hours a day.

Key features
- The two glass tubes on the front showed the stokers how much water was in the boilers, so they could make sure it didn’t run dry.
- The gauge at the top measured the pressure inside the boilers.

Discussion ideas
1. What can you see?
2. 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 (stage 3).

Key features
- When the big wheel turns, it makes two 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 are original. They were chosen by the designer, Lord William Armstrong, as these were the colours on his family crest.

Discussion ideas
1. What can you see?
2. Do you think the machines have always been this colour? What colours are engines normally?
4 Accumulators

These accumulators stored pressurised water from the hydraulic 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, when down low they are empty.
- To open the Bridge, the accumulators would be lowered, releasing 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 1: 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 builder and steel manufacturer

A person who designs and builds engines and big public structures like bridges, roads railways and tunnels. This person helped to design Tower Bridge.

Worksheet 2: 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 3: 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.

Worksheet 4: The Engine Rooms

1. Steam
2. Wheel
3. Pump
4. Accumulator
Tower Bridge is an old bridge. It was first opened in 1894 which means it’s Victorian. Watch the black and white film and imagine you’ve gone back in time to Victorian London when the films were made. Circle the words which describe what it would have been like then can you think of any other adjectives?

Busy         Noisy
Smelly       Interesting
Exciting     Dirty
Boring       Relaxing
Quiet

Above the film are four portraits 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 builder and steel manufacturer
A person who designs and builds engines and big public structures like bridges, roads, railways and tunnels. This person helped to design Tower Bridge.
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.

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Through this window you can see nearly 1000 years of history, from the Tower of London to the Shard. 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 names then you can add them too!

- **Oldest**
  - Made from stone
  - Hay’s Wharf
    - Made from brick
  - Tower Bridge
    - Made from stone, brick and metal
- **Youngest**
  - Made from glass
These are the machines which used to make the power needed to open Tower Bridge. As you move through The Engine Rooms, can you complete the gaps with the missing words from those below?

In the boilers, coal fires boiled water to make

The steam turned a big steam accumulator which powered a water pump

The water pushed the pressured water into giant accumulators to be stored.

When Tower Bridge needed to open, the pressured water was pushed out of the

which powered an engine to turn a cog using pressurised water. Using water to move things is called hydraulics.

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.