A STADIUM IN THE CITY
How to use this sheet

The Olympic stadium, the theatre of the Olympians' sporting exploits, is a key element of the Olympic Games. The building becomes part of the era and the environment in which it was built.

The Olympic Games are a unique event that welcome a record number of athletes and spectators for the most intense sporting competition on the planet. The Olympic stadium is an exceptional building, in keeping with the exceptional nature of the event.

It makes a strong architectural statement and leaves a lasting imprint on the environment. Its lifespan extends far beyond the duration of the Games themselves.

This sheet focuses on:

• The history of stadium architecture, from Antiquity to the present day
• The impact of the stadium construction on the host city
• Figures that capture the size of Olympic stadiums through history, and the issues they raise

This document should be used in conjunction with the activity sheet on the same topic.

The activity sheet gives children aged 9 to 15 the opportunity to learn more about the Olympic stadiums in a way that brings the topic to life.

→ Download from www.olympic.org/education
   > Teaching Resources

The interactive Serious Game provides an introduction to the principles of sustainable development and their relevance to the Olympic stadium.

→ Available from https://www.olympic.org/museum/visit/schools/teaching-resources/support-de-cours/a-stadium-in-the-city
Introduction

The history of Olympic stadiums goes back a very long way. The first one was built in Ancient Greece, in the 5th century B.C., in Olympia. At the time, the term "stadium" referred to a unit of distance – the length of the track at Olympia, which measured 192.25 metres or 600 Greek feet.

From Roman amphitheatres to modern stadiums, not forgetting the town squares that set the stage for races in the Middle Ages, stadiums have continued to evolve.

The Olympic stadium is a place of excitement and spectacle, a backdrop to the athletes' achievements, and an architectural challenge for its designers. In modern times, Olympic stadiums generally host the athletics competitions, and set the stage for the Opening and Closing Ceremonies of the Games.

Beyond the 16 days of competition, the lifespan of the stadium, from the preliminary sketches to its eventual demolition, is measured in decades. Hundreds of different professions and trades are involved in transforming the idea into reality. The Olympic stadium is a collective project that reflects the concerns of its time.

Exploring the architectural and urban planning aspects of an Olympic stadium gives an insight into the creative dimension of these buildings, and the facilities that shape the landscape and leave a mark on their era.

Contents

Olympic stadium architecture
• Stadium architecture, a history going back two millennia
• Sustainable development, an essential feature of architectural design
• The Olympic stadium, architecture for the long term.

The impact of stadium construction on the host city
• Location: an urban planning tool
• Transport, a vital element.

Olympic stadiums in figures
• Stadiums through the years
• Conversion of the London 2012 stadium, key figures.

Glossary
Olympic stadium architecture

Stadium architecture, a history going back two millennia

The appearance of stadiums has evolved significantly since ancient times. From the simple track surrounded by earthen slopes in Olympia, the stadium then took the form of a circus, the most famous example being the Colosseum in Rome. In the Middle Ages, competitions would be staged in town squares (e.g. horse races). The industrial era marked the resurgence of sports and leisure, and the revival of the Olympic Games. At that time, stadiums were imposing buildings that made the most of the latest technologies, such as concrete and steel.

Although there are many differences through the ages, all Olympic stadiums share some common features:

- a field of play for the athletics events or other sports.
- tiered seating for spectators to watch the competitions and ceremonies.
- an optional, sometimes retractable, roof, which might cover the stadium fully or partially.

As well as these common elements, some stadiums are notable for their remarkable architecture.

The stadium at Olympia had marble starting blocks!

The stadium of the 1908 Olympic Games in London was completed in just ten months, and included a cycling track around the outside of the athletics track, and a swimming and diving pool in the centre.

More recently, in London again, the stadium built for the 2012 Olympic Games has a convenient modular structure. Seating can be extended over the athletics track to bring the spectators closer to the action when football and rugby matches are played.
Sustainable development, an essential feature of architectural design

For the architect in charge of the project, it is vital to consider the long-term sustainability implications of the Olympic stadium.

Good practice should be observed in terms of environmentally responsible construction, respect for ecosystems, biodiversity and natural resources. Particular attention should be paid to the volume of waste generated by the stadium construction, and its impact on air and water quality.

The choice of construction materials is also crucial. Locally-sourced, recyclable and durable materials should be selected if possible. The London 2012 stadium, for example, used 10,000 tonnes of steel, the majority of which was recycled.

And finally, thinking about the long-term future of the stadium means thinking about its users. Athletes, spectators and officials need to be able to access the building as easily as possible with the help of a tailored public transport solution.
The Olympic stadium, architecture for the long term

Because the Olympic stadium has a lifespan far longer than the 16 days of the Olympic Games, its future use must be taken into account from the design stage.

After the Olympic Games, the stadium can then host other kinds of events, such as shows, concerts and other sports competitions. It is therefore vital for the architect to plan storage space, modular seating and lighting installations into the design, as was the case for the London 2012 Olympic stadium.

The Olympic stadium and its ancillary facilities could also be designed to have a limited lifespan, with the intention of totally or partially dismantling them after the Games. The Future Arena in Rio, which hosted the handball events of the 2016 Games, was designed to be dismantled and reused to build four public schools.

Finally, the architecture of some Olympic stadiums can be so remarkable that the building becomes a tourist attraction in its own right, once the Games are over. This was the case of the Beijing 2008 stadium, which is considered a work of art by its visitors. The calm and relaxing atmosphere inside the shady structure, located in the bustling Chinese capital, is also a factor in its popularity.
The impact of stadium construction on the host city

“A stadium, more than any other building type in history, has the ability to shape a town or city. A stadium is able to put a community on the map, establishing an identity and providing a focal point in the landscape.”

Rod Sheard, architect of the London 2012 Stadium, Populous, in “Stadiums, people, passions, stories”

Location: an urban planning tool

Designing an Olympic stadium is not just about designing a building. It also means taking into account the immediate environment, and deciding what other provisions need to be made around the building itself. This is part of what makes the choice of location vital. Building an Olympic stadium can be an opportunity to revitalise a run-down industrial or commercial area. The Olympic stadium project can provide an opportunity to decontaminate a patch of land and give it a new life and long-term prospects.

Let’s look at Sydney’s stadium, which was built for the 2000 Olympic Games. The Olympic stadium was located in Homebush Bay, a highly polluted site previously occupied by an abattoir and an industrial dump, and completely transformed the appearance of this urban area. As part of the decontamination effort, around 9 million cubic metres of waste were treated and eliminated.

Transport, a vital element

Because athletes need to focus on their competition, access to the stadium must be as smooth as possible for them. A location close to the Olympic Village can make this easier. In this case, the chosen area must be sufficiently big to contain all the facilities required. The public transport network will also need attention, to ensure the Olympic stadium zone is connected to the rest of the city. For the London 2012 Olympic Games, Stratford station was connected with a third of the stations on the London tube network.

It is also essential that spectators have easy access to the stadium and the transport system it is linked to. Links to rail stations, airports and shopping centres must be thought through, as well as issues of traffic flow. In order to avoid traffic jams and congestion on the roads, the final kilometre between the car park and the stadium entrance is often covered on foot. Public transport should be given priority, and reducing the area taken up by car parks around the stadium is also a way of reducing the carbon footprint of construction.
## Olympic stadiums in figures

### Stadiums through the years

This is a guide to some of the stadiums that have marked the history of the Olympic Games. Although their appearance might differ, depending on the time of their construction and their particular architects, they all have some features in common. Whatever the period of history, an Olympic stadium takes several years to build. It’s a vast project. Because of the sports requirements, the dimensions of the track vary very little from one stadium to another. Finally, all stadiums are designed to hold a very large number of spectators.

<table>
<thead>
<tr>
<th>Host city</th>
<th>Name of the stadium</th>
<th>Architect/Engineer</th>
<th>Date (duration) of construction</th>
<th>Shape of the stadium</th>
<th>Number of spectators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olympie</td>
<td>Stadion</td>
<td>Unknown</td>
<td>5th century B.C.</td>
<td>Rectangular</td>
<td>45 000</td>
</tr>
<tr>
<td>Londres 1908</td>
<td>White City Stadium</td>
<td>James Black Fulton and J.J Webster</td>
<td>1907-1908</td>
<td>Oval</td>
<td>66 288</td>
</tr>
<tr>
<td>Berlin 1936</td>
<td>Olympiastadion</td>
<td>Werner March</td>
<td>1934-1936</td>
<td>Round</td>
<td>100 000</td>
</tr>
<tr>
<td>Rome 1960</td>
<td>Stadio Olimpico</td>
<td>Annibale Vitellozzi and Carlo Roccatelli</td>
<td>1949-1953</td>
<td>Oval</td>
<td>65 000</td>
</tr>
</tbody>
</table>

### Did you know?

- Since ancient times, crowd management has always been a significant concern when designing Olympic stadiums. The Colosseum had a network of underground walkways and corridors called vomitoria that made it possible to evacuate several tens of thousands of spectators in just 5 to 10 minutes!
- Tests have been carried out to compare the evacuation time of the Colosseum in Rome and the Bird’s Nest stadium in Beijing. The Colosseum won, by a few seconds!
Conversion of the London stadium, key figures

The Olympic stadium is a large-scale project. It needs time, vast quantities of materials, and huge teams of workers to be able to hold the maximum number of spectators. Its lifespan is not limited to the Olympic Games themselves; its conversion into a permanent urban facility also requires a major effort.

The London 2012 Olympic stadium, for instance, had to undergo a major transformation before it could begin its second life. Today it is used for other sports competitions and concerts, and the new Mayor of London has announced that the stadium area will be designated an area of heritage and culture for London.

The conversion work included:

- installation of a 45,000 m² roof;
- reinforcing the structure to support the new roof;
- installation of 6 km of steel cabling weighing 930 tons to support the roof;
- installation of 21,000 retractable seats to provide a more flexible seating solution for the various different events it hosts;
- construction of 995 toilets;
- purchase of 428 wheelchairs, making it one of the most disability friendly facilities in the country;
- construction of a new 400 m track;
- the conversion involved 5,000 people and 2 million working hours.
**Glossary**

**Arena**
This refers to the central part of a Roman amphitheatre, with its sandy surface, at the base of the tiered seats. In the amphitheatres of Nîmes or Arles, this is where the entertainment would occur. The word comes from the Latin word arena or harena, which originally referred to fine sand, and by extension came to mean the centre of a Roman amphitheatre.

**Amphitheatre**
A large circular or oval building built to hold a large audience for a variety of events (sport, theatre, fights, etc.). It comes from the Latin amphitheatrum, borrowed from the Greek amphi (άμφι) meaning 'around' and theatron (θεάτρον), theatre.

**Circus**
In Roman antiquity the circus was a vast enclosure, either open-air or covered by a velarium, floored with sand, surrounded by tiered seating, in which public events would take place (chariot racing, wild animal baiting, naval battle reconstructions (in which case the circus would be flooded).

From the Latin circus (circle). A circus was the Roman version of the Greek hippodrome, however the spina, the central wall around which the chariots would race, was not present in the Greek version.

**Sustainable development**
“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”
Brundtland Report, 1987

**Legacy**
A stadium that leaves a positive legacy is one that:
- Has improved access, making it easy to reach using public transport.
- Becomes a tourist attraction, from which the city and entire region can benefit.
- Is not only capable of hosting high-profile sports events, but also other national and international events.
- Offers citizens the means to practise their favourite sports in top-class facilities and in a historic location.
- Provides jobs and/or training opportunities for the local community.
- Is regularly used for events over the years to come.
- Has a future budget that includes investment in its infrastructure.

**Track**
A straight, oval or circular surface in the centre of an arena or stadium that, depending on its layout and surface, is designed for the practice of a particular sport (athletics, cycling, mechanical sports).

**Olympic stadium**
For the summer Olympic Games, the term “Olympic stadium” generally refers to the stadium that hosts the athletics events. Traditionally, the Opening and Closing Ceremonies also take place there. The Olympic stadium must meet the specifications defined by the rules that govern the Olympic Games.

**Urban planning**
The artistic, scientific and technical disciplines involved in adapting an urban area for a particular use, according to its zoning status.