**Architecture and Science**

1. **Reading**
2. **Read the texts below and match three of the pictures in page 6 with the buildings described in the three texts.**
3. **Per each building, list the major problems and explain how they were solved.**

**Text A**

**The London City Hall : picture 5**

The London City Hall houses the Mayor of London, the London Assembly and the Greater London Authority. The use of glass and a giant helical staircase in the interior are supposed to symbolise the transparency and the accessibility of the democratic process. What is most striking when looking from the outside, though, is the building's odd shape.

Perched on the banks of the river Thames, the building is reminiscent of a river pebble, with its roundness again hinting at the democratic ideal. But the shape was not only chosen for its looks, but also to maximise energy efficiency. One way of doing this is to minimise the surface area of the building, so that unwanted heat loss or gain can be prevented. As the mathematicians amongst you will know, of all solid shapes, the sphere has the least surface area compared to volume. This is why the London City Hall has a near-spherical shape.

The building's lopsidedness is also conducive to energy efficiency: the overhang on the South side ensures that windows here are shaded by the floor above, thus reducing the need for cooling in the summer. Computer modelling showed how air currents move through the building and the geometry within the building was chosen to maximise natural ventilation. In fact, the building does not require any cooling at all and reportedly uses only a quarter of the energy of comparable office spaces.

Even the helical staircase was not chosen for entirely aesthetic reasons. As part of their analysis, the SMG[[1]](#footnote-2) modelled the lobby's acoustics, quite appropriately for a building representing the voice of the people. Initially the acoustics were terrible with echoes bouncing around the large hall. Something was needed to break up the space. One of Foster + Partners' past projects provided a clue: the [Reichstag](http://www.fosterandpartners.com/Projects/0686/Default.aspx) in Berlin also contains a large hall, but in this case it is broken up by a large spiral ramp. The SMG created a model of a similar spiral staircase for the London City Hall and the company Arup Acoustics analysed the acoustics for this new model.

**Text B**

### The Gherkin : picture 2

[The Gherkin](http://www.30stmaryaxe.com/index2.asp) is one of the projects the SMG[[2]](#footnote-3) was involved with and is a prime example of how geometry was chosen to satisfy constraints. Going by the official name of 30 St Mary Axe, the building is 180 metres tall, three times the height of the Niagara Falls. There are three main features that make it stand out from most other sky-scrapers: it's round rather than square, it bulges in the middle and tapers to a thin end towards the top, and it's based on a spiralling design. All these could easily be taken as purely aesthetic features, yet they all cater to specific constraints.

A major problem with buildings of the Gherkin's size is that air currents sweeping around them create whirlwinds at their base, making their immediate vicinity an uncomfortable place to be. To address this problem, the SMG advised the architects to use computer models which, based on the mathematics of turbulence, simulate a building's aerodynamic properties. The model showed that a cylindrical shape responds better to air currents than a square one and reduces whirlwinds. The fact that the tower bulges out in the middle, reaching its maximal diameter at the 16th floor, also helps to minimise winds at its slimmer base.

But even if you're not being ruffled by strong winds, standing next to a sky-scraper can be eery. It dwarfs you, it eclipses shorter buildings and it takes away the sunlight. Again, it's the Gherkin's distinctive shape that helps minimise these effects. Its bulging middle and its tapered top ensure that you never see its top from below, thus not making you feel quite as small. And the Sun and other views still have a chance to peep through to the bottom.

One thing that was decided at the outset was that the Gherkin should be as sustainable a building as possible, and this meant choosing a shape that maximises natural air ventilation (to save on air-conditioning) and the influx of natural sunlight (to save on heating and lighting bills). Six triangular wedges were cut out of the circular plan of each floor, penetrating deep into the building's interior. These serve as light wells, and the shafts they create increase natural ventilation. However, the wedges do not sit right on top of each other. Aerodynamic modelling showed that ventilation is maximised if the plan of one floor is rotated by several degrees with respect to the one below. Thus, the shafts the wedges create spiral up the building and interact optimally with the air currents caused by the building's outward shape. Windows in the facade of the wedges open automatically and draw fresh air into the building. As a result of this carefully chosen geometry, the building reportedly uses 50% less energy than others of comparable size.

**Text C**

**The Great Court, British Museum : picture 6**

The courtyard at the centre of the British Museum was one of London’s long-lost spaces. Originally a garden, soon after its completion in the mid-nineteenth century it was filled by the round Reading Room and its associated bookstacks. Without this space the Museum was like a city without a park. This project is about its reinvention.

With over six million visitors annually, the British Museum is as popular as the Louvre or the Metropolitan Museum of Art. However, in the absence of a centralised circulation system it was congested and difficult to navigate. The departure of the British Library was the catalyst for removing the bookstacks and recapturing the courtyard as a new public focus. The Great Court is entered from the Museum’s principal level and connects all the surrounding galleries. Within the space there are information points, a bookshop and café. At its heart is the magnificent volume of the Reading Room, now a major exhibition space, which for the first time in its history is open to all. Broad staircases encircling the Reading Room lead to a temporary exhibitions gallery and a restaurant terrace. Beneath the courtyard are the Sainsbury African Galleries, an education centre and facilities for schoolchildren.

The glazed canopy that makes all this possible is a fusion of state-of-the-art engineering and economy of form. Its unique geometry is designed to span the irregular gap between the drum of the Reading Room and the courtyard facades, and forms both the primary structure and the framing for the glazing, which is designed to reduce solar gain. As a cultural square, the Court also resonates beyond the confines of the museum, forming a new link in the pedestrian route from the British Library to Covent Garden, the river and the South Bank. To complement this artery, the Museum’s forecourt was restored to form a new civic space. Together with the Great Court, it is a major new amenity for London.

|  |  |
| --- | --- |
| **Figure 1** | **Figure 2 : Text B**    **The problem is that the air currents sweeping around it and create whirlwinds at it base. The domed tower in the middle, helps to minimize winds at its thinner base.** |
| **Figure 3** | **Figure 4** |
| **Figure 5 : Text A**  The London City Hall  **Initially the acoustics were terrible with echoes bouncing around the large hall. The SMG created a model of a similar spiral staircase for the London City Hall to broken up the echoes.** | **Figure 6 : Text C**  **With no centralized traffic system, it was congested and difficult to navigate.**  **The large courtyard is now accessible from the main level of the museum and connects all the surrounding galleries.** |

**B. Listening**

**University of Oxford Podcast**

**14 April 2009**

<http://podcasts.ox.ac.uk/dark-matter-and-architecture-science>

**Listen to the podcast [16:34-18:25] and make notes. Match the adjectives on the left with the nouns on the right. Then listen to the podcast again and check your answers.**

|  |  |
| --- | --- |
| scientific | science |
| leading scientific | research groups |
| state of the art | buildings |
| beautiful | perceptions |
| intriguing coloured |  |
| public | glass fins |
| inaccessible | department boundaries |
| cutting-edge | nature of scientific research |
| organic-shaped |  |
| naturally-ventilated | Atrium |
| timber-clad | staircases |
| dramatic sculptural | glass structure |
| chance | outputs |
| traditional | Conversation |
|  |  |

**Complete the transcript below with the missing verbal forms:**

**Transcript [16:34-18:25]**

Well, we …… from the very global to the slightly more local, which is talking about the actual environment in which you do science. I mean, where you do your science it is your environment… does it affects your scientific outputs? Many leading scientific research groups across the world believe a good building could make a huge difference to good research and one lucky department, here in Oxford, moved into a state-of-the-art building this year which many believe we are ……… the research done by its inhabitants.

The new Biochemistry building in Oxford is a beautiful glass structure with intriguing coloured glass fins attached to the size whose colours pick up the rich red, terra-cotta, orange, brown and plum of the surrounding buildings, providing a bold, yet complimentary type on the history setting of Oxford. The glass façade is made to make a statement about the transparency of the research being dome inside, challenging public perceptions of the inaccessible nature of scientific research. You can literally see scientists doing their science. The department is doing some of the most cutting edge science in the world, into understanding DNA, cell broth and immunity. But the inside of the building is perhaps more important to those actually doing the science. All of the interior spaces revolved around in organic-shaped, naturally ventilated timber-clad atrium. Dramatic sculptural staircases criss-cross the atrium which facilitate chance encounters and conversations between researchers. And this was key to the design of the building. Before, the department’s scientists were ……….. in outmoded buildings spread accros the university with little opportunity for interaction. But time and again, it is a chance conversation that can lead to new connections and collaborations emerging, especially in a subject that has become increasingly interdisciplinary and no longer relays on traditional department boundaries.

**C. Grammar**

## Read the text below and choose the right verbal text to fill in the gaps:

## *The Big Idea*

This building **has become [becomes/has become]** recognised as a new model for university research buildings. It **reverses [reverses/has reversed]** the accepted layout that collects the laboratories in the dark centre of the building and instead puts the laboratories on the outside where they have contact with the outside world and are highly visible to the wider university community.

This **allows** the ‘write up’, teaching spaces and principal investigators offices to be collected around a busy atrium at the heart of the building. This interconnected way of working **has increased [increases/has increased]** the number of research projects the department **sponsors [sponsors/has sponsored]**, **has increased [increases/(has)increased]** overall funding and **attracts [attracts/has attracted]** new researchers, lecturers and students from around the world.

The building exterior is much published, and photographed, because it is entirely made up of coloured glass fins that reflect the colours of the historic buildings that surround it. The coloured glass **reflects [reflects/has reflected]** coloured sunlight into the building during the day and at night **projects [projects/has projected]** spectacular colours out into the surrounding streets of the Science Area in Oxford.

# Words used to describe the shape of objects

MacMillan Dictionary

|  |  |  |  |
| --- | --- | --- | --- |
| **[aerodynamic](https://www.macmillandictionary.com/dictionary/british/aerodynamic" \l "aerodynamic__1)**  [an](https://www.macmillandictionary.com/dictionary/british/aerodynamic" \l "aerodynamic__1) [aerodynamic](https://www.macmillandictionary.com/dictionary/british/aerodynamic) [shape](https://www.macmillandictionary.com/dictionary/british/shape_1) or [design](https://www.macmillandictionary.com/dictionary/british/design_1) [allows](https://www.macmillandictionary.com/dictionary/british/allow) a [plane](https://www.macmillandictionary.com/dictionary/british/plane_1), [car](https://www.macmillandictionary.com/dictionary/british/car) etc to move through the [air](https://www.macmillandictionary.com/dictionary/british/air_1) in a [smooth](https://www.macmillandictionary.com/dictionary/british/smooth_1) and [fast](https://www.macmillandictionary.com/dictionary/british/fast_1) way  **[angular](https://www.macmillandictionary.com/dictionary/british/angular" \l "angular__3)**  [containing](https://www.macmillandictionary.com/dictionary/british/contain) a [lot](https://www.macmillandictionary.com/dictionary/british/lot_1) of [angles](https://www.macmillandictionary.com/dictionary/british/angle_1)  **[as flat as a pancake](https://www.macmillandictionary.com/dictionary/british/as-flat-as-a-pancake" \l "as-flat-as-a-pancake__1)**  [very](https://www.macmillandictionary.com/dictionary/british/as-flat-as-a-pancake" \l "as-flat-as-a-pancake__1) [flat](https://www.macmillandictionary.com/dictionary/british/flat_1)  **[asymmetrical](https://www.macmillandictionary.com/dictionary/british/asymmetrical" \l "asymmetrical__1)**  [something that is](https://www.macmillandictionary.com/dictionary/british/asymmetrical" \l "asymmetrical__1) [asymmetrical](https://www.macmillandictionary.com/dictionary/british/asymmetrical) [does](https://www.macmillandictionary.com/dictionary/british/does) not have the same [shape](https://www.macmillandictionary.com/dictionary/british/shape_1) and [size](https://www.macmillandictionary.com/dictionary/british/size_1) on both sides  **[bent](https://www.macmillandictionary.com/dictionary/british/bent_1" \l "bent_1__1)**  [a](https://www.macmillandictionary.com/dictionary/british/bent_1" \l "bent_1__1) [bent](https://www.macmillandictionary.com/dictionary/british/bent_1) [object](https://www.macmillandictionary.com/dictionary/british/object_1) has a [curved](https://www.macmillandictionary.com/dictionary/british/curved) or [twisted](https://www.macmillandictionary.com/dictionary/british/twisted) [shape](https://www.macmillandictionary.com/dictionary/british/shape_1)  **[bulbous](https://www.macmillandictionary.com/dictionary/british/bulbous" \l "bulbous__1)**  [big](https://www.macmillandictionary.com/dictionary/british/big_1) and round, or [shaped](https://www.macmillandictionary.com/dictionary/british/shaped_1) [like](https://www.macmillandictionary.com/dictionary/british/like_1) an [onion](https://www.macmillandictionary.com/dictionary/british/onion)  **[chunky](https://www.macmillandictionary.com/dictionary/british/chunky" \l "chunky__1)**  [thick and](https://www.macmillandictionary.com/dictionary/british/chunky" \l "chunky__1) [square](https://www.macmillandictionary.com/dictionary/british/square_1) in [shape](https://www.macmillandictionary.com/dictionary/british/shape_1)  **[clean](https://www.macmillandictionary.com/dictionary/british/clean_1" \l "clean_1__28)**  [clean](https://www.macmillandictionary.com/dictionary/british/clean_1) [shapes](https://www.macmillandictionary.com/dictionary/british/shape_1), [lines](https://www.macmillandictionary.com/dictionary/british/lines), or [movements](https://www.macmillandictionary.com/dictionary/british/movement) are [smooth](https://www.macmillandictionary.com/dictionary/british/smooth_1), [regular](https://www.macmillandictionary.com/dictionary/british/regular_1), or [tidy](https://www.macmillandictionary.com/dictionary/british/tidy_1)  **[closed](https://www.macmillandictionary.com/dictionary/british/closed" \l "closed__17)**  [forming](https://www.macmillandictionary.com/dictionary/british/form_2) a [complete](https://www.macmillandictionary.com/dictionary/british/complete_1) [circle](https://www.macmillandictionary.com/dictionary/british/circle_1)  **[proportioned](https://www.macmillandictionary.com/dictionary/british/proportioned" \l "proportioned__1)**  [used](https://www.macmillandictionary.com/dictionary/british/used) after some [adverbs](https://www.macmillandictionary.com/dictionary/british/adverb) for [describing](https://www.macmillandictionary.com/dictionary/british/describe) the way that the [different](https://www.macmillandictionary.com/dictionary/british/different) [parts](https://www.macmillandictionary.com/dictionary/british/part_1) of something [combine](https://www.macmillandictionary.com/dictionary/british/combine_1)  **[regular](https://www.macmillandictionary.com/dictionary/british/regular_1" \l "regular_1__6)**  [arranged](https://www.macmillandictionary.com/dictionary/british/arrange) to form an even [shape](https://www.macmillandictionary.com/dictionary/british/shape_1)  **[regularly](https://www.macmillandictionary.com/dictionary/british/regularly" \l "regularly__7)**  [with an even](https://www.macmillandictionary.com/dictionary/british/regularly" \l "regularly__7) [shape](https://www.macmillandictionary.com/dictionary/british/shape_1), or [arranged](https://www.macmillandictionary.com/dictionary/british/arrange) with an [equal](https://www.macmillandictionary.com/dictionary/british/equal_1) amount of [space](https://www.macmillandictionary.com/dictionary/british/space_1) between [objects](https://www.macmillandictionary.com/dictionary/british/object_1)  **[rolled-up](https://www.macmillandictionary.com/dictionary/british/rolled-up" \l "rolled-up__1)**  [rolled](https://www.macmillandictionary.com/dictionary/british/roll_1) and [folded](https://www.macmillandictionary.com/dictionary/british/fold_1) in the [shape](https://www.macmillandictionary.com/dictionary/british/shape_1) of a [tube](https://www.macmillandictionary.com/dictionary/british/tube)  **[round](https://www.macmillandictionary.com/dictionary/british/round_2" \l "round_2__1)**  [shaped](https://www.macmillandictionary.com/dictionary/british/shaped_1) [like](https://www.macmillandictionary.com/dictionary/british/like_1) a [circle](https://www.macmillandictionary.com/dictionary/british/circle_1) or a [ball](https://www.macmillandictionary.com/dictionary/british/ball_1)  **[round](https://www.macmillandictionary.com/dictionary/british/round_2" \l "round_2__5)**  [curved](https://www.macmillandictionary.com/dictionary/british/curved)  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[holes](https://www.macmillandictionary.com/dictionary/british/hole_1) or empty [space](https://www.macmillandictionary.com/dictionary/british/space_1) [inside](https://www.macmillandictionary.com/dictionary/british/inside_1) it  **[square](https://www.macmillandictionary.com/dictionary/british/square_2" \l "square_2__3)**  with [edges](https://www.macmillandictionary.com/dictionary/british/edge_1) or [corners](https://www.macmillandictionary.com/dictionary/british/corner_1) that are not as [curved](https://www.macmillandictionary.com/dictionary/british/curved) as [usual](https://www.macmillandictionary.com/dictionary/british/usual)  **[straight](https://www.macmillandictionary.com/dictionary/british/straight_2" \l "straight_2__1)**  [something that is](https://www.macmillandictionary.com/dictionary/british/straight_2" \l "straight_2__1) [straight](https://www.macmillandictionary.com/dictionary/british/straight_1) [does](https://www.macmillandictionary.com/dictionary/british/does) not [bend](https://www.macmillandictionary.com/dictionary/british/bend_1) or [curve](https://www.macmillandictionary.com/dictionary/british/curve_1)  **[sweeping](https://www.macmillandictionary.com/dictionary/british/sweeping" \l "sweeping__4)**  [with a](https://www.macmillandictionary.com/dictionary/british/sweeping" \l "sweeping__4) [wide](https://www.macmillandictionary.com/dictionary/british/wide_1) [impressive](https://www.macmillandictionary.com/dictionary/british/impressive) [curved](https://www.macmillandictionary.com/dictionary/british/curved) [shape](https://www.macmillandictionary.com/dictionary/british/shape_1)  **[symmetrical](https://www.macmillandictionary.com/dictionary/british/symmetrical" \l "symmetrical__1)**  a [symmetrical](https://www.macmillandictionary.com/dictionary/british/symmetrical) [shape](https://www.macmillandictionary.com/dictionary/british/shape_1) or [object](https://www.macmillandictionary.com/dictionary/british/object_1) has two [halves](https://www.macmillandictionary.com/dictionary/british/halves) that are [exactly](https://www.macmillandictionary.com/dictionary/british/exactly) the same  **[tapered](https://www.macmillandictionary.com/dictionary/british/tapered" \l "tapered__1)**  [narrower](https://www.macmillandictionary.com/dictionary/british/narrow_1) at one [end](https://www.macmillandictionary.com/dictionary/british/end_1)  **[tapering](https://www.macmillandictionary.com/dictionary/british/tapering" \l "tapering__1)**  [getting](https://www.macmillandictionary.com/dictionary/british/get) [narrower](https://www.macmillandictionary.com/dictionary/british/narrow_1) towards one [end](https://www.macmillandictionary.com/dictionary/british/end_1)  **[three-cornered](https://www.macmillandictionary.com/dictionary/british/three-cornered" \l "three-cornered__1)**  [with three](https://www.macmillandictionary.com/dictionary/british/three-cornered" \l "three-cornered__1) [corners](https://www.macmillandictionary.com/dictionary/british/corner_1) | **[cuboid](https://www.macmillandictionary.com/dictionary/british/cuboid_2" \l "cuboid_2__1)**  [shaped](https://www.macmillandictionary.com/dictionary/british/shaped_1) [like](https://www.macmillandictionary.com/dictionary/british/like_1) a [cube](https://www.macmillandictionary.com/dictionary/british/cube_1) or [like](https://www.macmillandictionary.com/dictionary/british/like_1) a [cuboid](https://www.macmillandictionary.com/dictionary/british/cuboid_1)  **[curly](https://www.macmillandictionary.com/dictionary/british/curly" \l "curly__1)**  [forming](https://www.macmillandictionary.com/dictionary/british/form_2) [curves](https://www.macmillandictionary.com/dictionary/british/curve_1) or [circles](https://www.macmillandictionary.com/dictionary/british/circle_1)  **[curved](https://www.macmillandictionary.com/dictionary/british/curved" \l "curved__1)**  [forming](https://www.macmillandictionary.com/dictionary/british/form_2) a [curve](https://www.macmillandictionary.com/dictionary/british/curve_1)  **[curvy](https://www.macmillandictionary.com/dictionary/british/curvy" \l "curvy__1)**  [informal](https://www.macmillandictionary.com/dictionary/british/curvy" \l "curvy__1) [forming](https://www.macmillandictionary.com/dictionary/british/form_2) or full of [curves](https://www.macmillandictionary.com/dictionary/british/curve_1)  **[deformed](https://www.macmillandictionary.com/dictionary/british/deformed" \l "deformed__1)**  [something that is](https://www.macmillandictionary.com/dictionary/british/deformed" \l "deformed__1) [deformed](https://www.macmillandictionary.com/dictionary/british/deformed) has a [different](https://www.macmillandictionary.com/dictionary/british/different) [shape](https://www.macmillandictionary.com/dictionary/british/shape_1) from what is [usual](https://www.macmillandictionary.com/dictionary/british/usual) or [natural](https://www.macmillandictionary.com/dictionary/british/natural_1) and is not [attractive](https://www.macmillandictionary.com/dictionary/british/attractive) to [look](https://www.macmillandictionary.com/dictionary/british/look_1) at  **[fitted](https://www.macmillandictionary.com/dictionary/british/fitted" \l "fitted__1)**  [made to](https://www.macmillandictionary.com/dictionary/british/fitted" \l "fitted__1) [fit](https://www.macmillandictionary.com/dictionary/british/fit_1) the [shape](https://www.macmillandictionary.com/dictionary/british/shape_1) of something [closely](https://www.macmillandictionary.com/dictionary/british/closely)  **[flat](https://www.macmillandictionary.com/dictionary/british/flat_2" \l "flat_2__7)**  [thin and](https://www.macmillandictionary.com/dictionary/british/flat_2" \l "flat_2__7) [wide](https://www.macmillandictionary.com/dictionary/british/wide_1) and not [curving](https://www.macmillandictionary.com/dictionary/british/curve_2) [inwards](https://www.macmillandictionary.com/dictionary/british/inwards) or [outwards](https://www.macmillandictionary.com/dictionary/british/outwards)  **[forked](https://www.macmillandictionary.com/dictionary/british/forked" \l "forked__1)**  [divided](https://www.macmillandictionary.com/dictionary/british/divided) into two [separate](https://www.macmillandictionary.com/dictionary/british/separate_1) [parts](https://www.macmillandictionary.com/dictionary/british/part_1) in a ‘Y’ [shape](https://www.macmillandictionary.com/dictionary/british/shape_1)  **[four-square](https://www.macmillandictionary.com/dictionary/british/four-square_2" \l "four-square_2__1)**  [square](https://www.macmillandictionary.com/dictionary/british/square_1) in [shape](https://www.macmillandictionary.com/dictionary/british/shape_1), with four [equal](https://www.macmillandictionary.com/dictionary/british/equal_1) sides  **[three-dimensional](https://www.macmillandictionary.com/dictionary/british/three-dimensional" \l "three-dimensional__1)**  [not](https://www.macmillandictionary.com/dictionary/british/three-dimensional" \l "three-dimensional__1) [flat](https://www.macmillandictionary.com/dictionary/british/flat_1), but [able](https://www.macmillandictionary.com/dictionary/british/able_1) to be [measured](https://www.macmillandictionary.com/dictionary/british/measured) in [height](https://www.macmillandictionary.com/dictionary/british/height), [depth](https://www.macmillandictionary.com/dictionary/british/depth), and [width](https://www.macmillandictionary.com/dictionary/british/width)  **[twisted](https://www.macmillandictionary.com/dictionary/british/twisted" \l "twisted__1)**  [bent](https://www.macmillandictionary.com/dictionary/british/bent_1) into a [shape](https://www.macmillandictionary.com/dictionary/british/shape_1) that is not [normal](https://www.macmillandictionary.com/dictionary/british/normal_1)  **[two-dimensional](https://www.macmillandictionary.com/dictionary/british/two-dimensional" \l "two-dimensional__1)**  [a](https://www.macmillandictionary.com/dictionary/british/two-dimensional" \l "two-dimensional__1) [two-dimensional](https://www.macmillandictionary.com/dictionary/british/two-dimensional) [shape](https://www.macmillandictionary.com/dictionary/british/shape_1) is [flat](https://www.macmillandictionary.com/dictionary/british/flat_1)  **[well-rounded](https://www.macmillandictionary.com/dictionary/british/well-rounded" \l "well-rounded__3)**  [with a](https://www.macmillandictionary.com/dictionary/british/well-rounded" \l "well-rounded__3) [strong](https://www.macmillandictionary.com/dictionary/british/strong) [attractive](https://www.macmillandictionary.com/dictionary/british/attractive) [shape](https://www.macmillandictionary.com/dictionary/british/shape_1)  **[well-turned](https://www.macmillandictionary.com/dictionary/british/well-turned" \l "well-turned__2)**  [with an](https://www.macmillandictionary.com/dictionary/british/well-turned" \l "well-turned__2) [attractive](https://www.macmillandictionary.com/dictionary/british/attractive) [curved](https://www.macmillandictionary.com/dictionary/british/curved) [shape](https://www.macmillandictionary.com/dictionary/british/shape_1)  **[wraparound](https://www.macmillandictionary.com/dictionary/british/wraparound_1" \l "wraparound_1__3)**  [wraparound](https://www.macmillandictionary.com/dictionary/british/wraparound_1) [objects](https://www.macmillandictionary.com/dictionary/british/object_1) [curve](https://www.macmillandictionary.com/dictionary/british/curve_1) around the sides of whatever they are [fitted](https://www.macmillandictionary.com/dictionary/british/fitted) to | **[geometric](https://www.macmillandictionary.com/dictionary/british/geometric" \l "geometric__2)**  [relating](https://www.macmillandictionary.com/dictionary/british/relate_1) to [simple](https://www.macmillandictionary.com/dictionary/british/simple) [shapes](https://www.macmillandictionary.com/dictionary/british/shape_1), [especially](https://www.macmillandictionary.com/dictionary/british/especially) when these form [regular](https://www.macmillandictionary.com/dictionary/british/regular_1) [patterns](https://www.macmillandictionary.com/dictionary/british/pattern_1)  **[globular](https://www.macmillandictionary.com/dictionary/british/globular" \l "globular__1)**  [in the](https://www.macmillandictionary.com/dictionary/british/globular" \l "globular__1) [shape](https://www.macmillandictionary.com/dictionary/british/shape_1) of a [small](https://www.macmillandictionary.com/dictionary/british/small_1) round [ball](https://www.macmillandictionary.com/dictionary/british/ball_1)  **[graceful](https://www.macmillandictionary.com/dictionary/british/graceful" \l "graceful__1)**  [a](https://www.macmillandictionary.com/dictionary/british/graceful" \l "graceful__1) [graceful](https://www.macmillandictionary.com/dictionary/british/graceful) [shape](https://www.macmillandictionary.com/dictionary/british/shape_1) or [object](https://www.macmillandictionary.com/dictionary/british/object_1) is [attractive](https://www.macmillandictionary.com/dictionary/british/attractive)  **[malformed](https://www.macmillandictionary.com/dictionary/british/malformed" \l "malformed__1)**  [badly](https://www.macmillandictionary.com/dictionary/british/badly) [formed](https://www.macmillandictionary.com/dictionary/british/form_2) or [shaped](https://www.macmillandictionary.com/dictionary/british/shaped_1)  **[misshapen](https://www.macmillandictionary.com/dictionary/british/misshapen" \l "misshapen__1)**  [badly](https://www.macmillandictionary.com/dictionary/british/badly) [formed](https://www.macmillandictionary.com/dictionary/british/form_2) or [twisted](https://www.macmillandictionary.com/dictionary/british/twisted) out of the [usual](https://www.macmillandictionary.com/dictionary/british/usual) or [natural](https://www.macmillandictionary.com/dictionary/british/natural_1) [shape](https://www.macmillandictionary.com/dictionary/british/shape_1)  **[oval](https://www.macmillandictionary.com/dictionary/british/oval" \l "oval__1)**  [with a](https://www.macmillandictionary.com/dictionary/british/oval" \l "oval__1) [shape](https://www.macmillandictionary.com/dictionary/british/shape_1) [like](https://www.macmillandictionary.com/dictionary/british/like_1) a long [narrow](https://www.macmillandictionary.com/dictionary/british/narrow_1) [circle](https://www.macmillandictionary.com/dictionary/british/circle_1)  **[peaked](https://www.macmillandictionary.com/dictionary/british/peaked" \l "peaked__1)**  [curving](https://www.macmillandictionary.com/dictionary/british/curve_2) or [rising](https://www.macmillandictionary.com/dictionary/british/rising) to a [point](https://www.macmillandictionary.com/dictionary/british/point_1)  **[pointed](https://www.macmillandictionary.com/dictionary/british/pointed" \l "pointed__1)**  [with a](https://www.macmillandictionary.com/dictionary/british/pointed" \l "pointed__1) [point](https://www.macmillandictionary.com/dictionary/british/point_1) at the [end](https://www.macmillandictionary.com/dictionary/british/end_1)  **[pointy](https://www.macmillandictionary.com/dictionary/british/pointy" \l "pointy__1)**  [(informal) with a](https://www.macmillandictionary.com/dictionary/british/pointy" \l "pointy__1) [point](https://www.macmillandictionary.com/dictionary/british/point_1) at the [end](https://www.macmillandictionary.com/dictionary/british/end_1) |

1. The Foster + Partners Specialist Modelling Group (SMG) was set up in 1997. The SMG's job is to help architects create virtual models of their project. [↑](#footnote-ref-2)
2. The Foster + Partners Specialist Modelling Group (SMG) was set up in 1997. The SMG's job is to help architects create virtual models of their project. [↑](#footnote-ref-3)