

# The Courtauld



## Primary School Architecture

A cross-curricular resource

# Introduction

Architecture is a fascinating topic that has rich cross-curricular connections for primary school children. This primary learning resource introduces the topic by exploring education buildings and their history. We begin by looking at Somerset House, the current home of The Courtauld Gallery, which was an important location for practical art and design education from 1780 to 1853. We then look at two case studies – a Victorian and a Modernist school – to introduce the background and ideas behind two of the most common types of school buildings in the UK. The resource also includes a more recent case study, which was inspired by the popular children's story *Fantastic Mr Fox*.

This learning resource will enable you and your students to look closer at your own school building (who built it) and local history (who lived in your community years ago). There are also strong connections with Science (forces and materials) as we introduce some core principles of architecture, such as how buildings stand up, Maths (scale and measurement), and Art and Design. Each section provides suggested classroom activities to help you explore these new concepts and ideas with your students. The resource also invites you and your students to reflect on the value of past architecture and on architecture's social and environmental responsibilities moving forward.

**Key Stage 2 Curriculum links include: Art and Design, English, History, Physical Education, Science**

## Learning aims

- Gain an awareness of how architecture and design shape our daily lives
- Discover the cultural and social history of schools in the UK
- Appreciate and research local architectural heritage
- Develop vocabulary for analysing buildings
- Engage creatively with contemporary architectural practice and current issues
- Think, draw and present ideas like an architect

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# Architecture at Somerset House from 1780–1853

## The role of the architect

An architect is someone who designs buildings. That means they decide how a building will look and how the inside spaces will work and feel for the people who use them. They create drawings to communicate their ideas to the people who actually make the building, such as bricklayers and carpenters. Architects have to balance how a building will look with other issues such as safety, practicality, affordability and sustainability.

## Somerset House – a very grand school!

Before the 1800s, most architects in Britain learned 'on the job'. They would learn important skills by watching and assisting older, more experienced architects. In the mid-1700s, architects and artists took steps to make their roles more respected. They wanted to emphasise the thinking and study behind their works. In 1768, the architect William Chambers (1723-1796) delivered a petition to King George III, asking him to support the creation of an academy where architects and artists could show their ideas to the public and provide training for a younger generation. George III agreed and the part of Somerset House now occupied by The Courtauld Gallery was originally designed by Chambers to house the new Royal Academy of Arts.

Chambers's Somerset House replaced an earlier building from Tudor times. Chambers used architecture inspired by ancient Greek and Roman buildings. This was called Neoclassicism or 'new classicism'. Features of classical buildings include columns and pediments, similar to those on Greek temples, and round arches and domes, developed by the Romans. Chambers provided rooms for meetings, lectures and drawing classes. A huge room was created on the top floor for an annual event called the Summer Exhibition, which still runs today at the Royal Academy's current home on Piccadilly in London.



## The importance of drawing for architects and designers

Architecture students at the Royal Academy Schools would draw from architectural casts. The casts were made by pouring plaster into moulds made after parts of famous buildings (you make a mould by pressing clay onto something to leave an imprint). You can still see some of the casts they would have drawn from by visiting the collection of Sir John Soane (1753-1837), a famous teacher and architect, in nearby Lincoln's Inn Fields. The Royal Academy moved out of Somerset House in 1837 and a new type of school was set up there. It was called the Government School of Design and provided training for all sorts of people involved in art and design, including architects (it later became the Royal College of Art). Similar schools were founded in other parts of the UK where there were lots of workshops and factories. The first director of the school, Sir Henry Cole (1808-1882), wanted all students to learn drawing skills. Classes were provided in elementary drawing (outline and shading), geometric drawing (shapes and patterns), figure drawing (people) and perspective drawing (architecture, see the activity on the next page).

- Somerset House was built in the 1700s as a place for architects and artists to show their ideas to the public and to study.
- The architect who designed it used lots of ideas from Greek and Roman buildings. This style is usually called Neoclassicism.
- Drawing is a very important skill for an architect, and students past and present learn lots of different types of drawing techniques.

## Talking points

What do you think it would feel like to go to school in a building like Somerset House?

Would you enjoy making so many drawings or do you prefer to be creative in a different way?

If you were to set up a school for architects, what lessons and trips would you provide for them?

## Activity

Today we have special computer programmes to help architects make their drawings, but architecture students still learn the basics of how to make perspective drawings by hand, just as they have for hundreds of years. A perspective drawing gives a two-dimensional image a sense of depth, which helps to test out and share architectural ideas.

Start your own architecture training by following the steps below to make a one-point perspective drawing. It is easiest to draw a street you know well. Try to remember as much as you can about the street your school is on. You can use your imagination to fill in any gaps.

**Step 1:** place a sheet of A4 paper in landscape orientation. In pencil, draw a horizon line. This will be your eye level – a low horizon line will mean you are looking up at the buildings, a high horizon line will mean you are looking down.

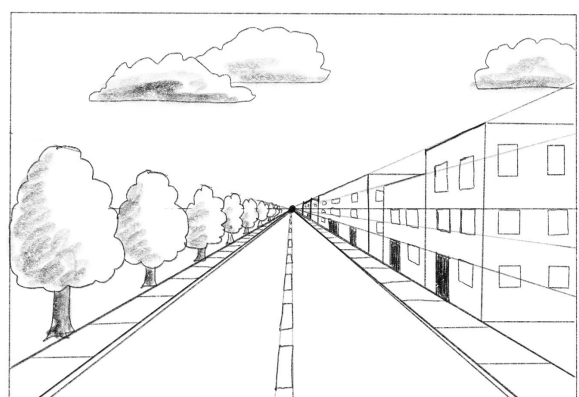
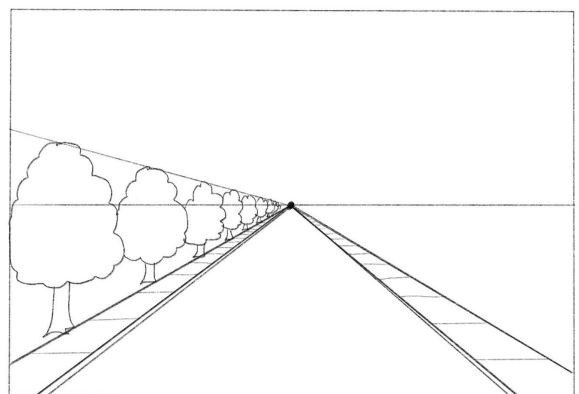
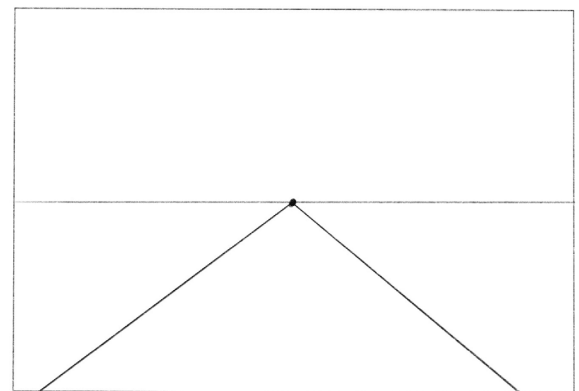
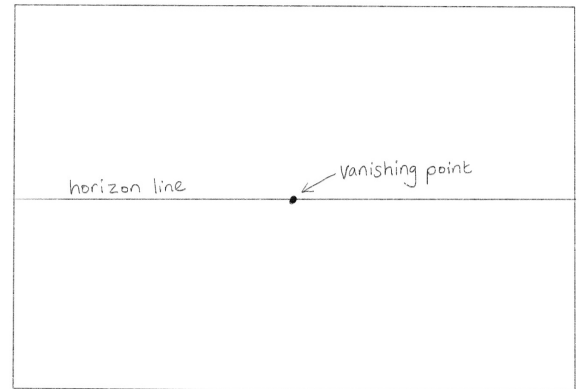
Draw a dot on the horizon line to mark your vanishing point (it is easiest to do this in the middle).

**Step 2:** draw a road using two lines that come together at the vanishing point.

**Step 3:** draw pavements on either side of the road. Mark the paving slabs with horizontal lines that get shorter and closer together towards the vanishing point. You can also add some trees.

**Step 4:** draw buildings from memory. Lightly pencil in some perspective lines to help you with the height of the roofs, windows and doors. They must all meet at the vanishing point.

Any sides of buildings/windows that are directly facing you will be square or rectangular in shape. Don't worry about making your drawing perfect. You are training your eyes and brain to work in new ways and this takes time!



# Researching the history of your school

Many schools in the UK have similar architecture. This is because there have been certain periods of our history which have led to the construction of lots of new schools. Views about education and the building materials and techniques of those times affected how these schools were designed. The next two case studies focus on schools built in two such eras, Victorian times and the post-World War II period. Perhaps your school was also built in one of these periods – the following information might help you find out.

## Victorian schools - key points

- There were lots of new schools required in Victorian times because in 1870 the government decided that everyone should go to school between the ages of 5 and 13.
- Before then many poor children had to work long hours and were not taught to read or write.
- Most Victorian schools have windows that are positioned above a child's eye level when sitting down. Victorian architects thought that children would be distracted if they could look outside.
- Most Victorian schools were built with bricks and mortar (walls), wood (windows, doors, floors and roof structure), glass (sash windows), slate (roof), plaster and terracotta clay (decoration).
- Victorian schools had large classes (of up to 60) and children sat in rows taking notes from a blackboard on slate tablets.
- Infants were taught on ground floors and older girls and boys were taught in separate classrooms on upper floors. This is why you often see separate boys' and girls' entrances.

## Post-World War II schools - key points

- After World War II the government made education free for everyone up to the age of 15.
- Lots of new schools were needed. Some older buildings had been damaged in the war and there were lots more children who needed school places due to the 'baby boom' and people migrating to the UK to help rebuild the country.
- Architects wanted to use new building techniques to make buildings that were clean and simple, connected with nature and filled with lots of daylight.
- Most schools of this period were built with concrete (walls, floors and roof), bricks and mortar (still an option for walls), steel (the frame of the building and windows), glass (large horizontal or porthole windows) and roofing felt (a waterproof covering).
- Schools now had smaller classes and were designed to make children feel welcome and allow for different types of lessons.

Perhaps you can already tell that your school was built in one of these time periods, or perhaps you think it could have been built at a completely different time. The activities on the next page might help you find out more.



## Activity 1

As a class write down a list of questions for things you would like to find out about your school.

Ask teachers and parents to help you find information. You may have a school library to use as a starting point.

Make a display board to teach other students about the architecture of your school. You could arrange this as a timeline with photographs, drawings, newspaper cuttings and your own labels.

You can also explore the history of the local area. Don't forget to add your own memories and experiences – these are part of the school's story.

## Activity 2

When was your school built? Find an example of another school that was built at a different time in history. This resource includes examples from the 1770s, 1880s, 1960s and present day. You could use one of these buildings or find a local example to visit in person.

Compare and contrast the two buildings on a sheet of A3 paper using a combination of words and sketches. For each school look at: the building materials, the size and height of windows, how many floors there are, where the doors are and what sort of outdoor spaces are provided.

In small groups discuss which type of school building you prefer. What are the good and bad points about the architecture for each building? What are your favourite school spaces? How would you change other parts of your school?

# Victorian school case study

Noel Park Primary School, Wood Green, London, built in 1889.

Architect: Charles Wall

## Historical background – what was happening in education and society at the time?

School is an essential part of our lives. It would be difficult to imagine not having our teachers and school friends, but when the British Government passed something called the Elementary Education Act in 1870, almost half of the 4.3 million children of primary school age in England and Wales did not have access to school education. This was the first of a number of acts of Parliament passed to create compulsory education for children aged between 5 and 13. Thousands of state-funded schools had to be built to meet the new demand. Parents had to pay for children's places, but the government would fund children from the poorest families.

During the reign of Queen Victoria (1837-1901), Britain's cities became increasingly over-crowded and polluted. The Industrial Revolution started in the 1700s, but 1870-1914 is often called the Second Industrial Revolution because there were so many new inventions. Adults and children left the countryside in huge numbers to find work in urban factories. Children could work long hours, with dangerous machinery, for very low wages. The government wanted to educate children so that they would make well-informed voting decisions as adults and contribute to a more skilled work force. They believed this would help Britain to keep ahead as an industrial power.

## Architectural background – how does the building connect with architectural ideas of the time?

Victorian architecture often borrowed ideas from different time periods and countries. At a time when society was changing very quickly, Victorians took comfort from looking back in history. For example, the Palace of Westminster (Houses of Parliament) was re-built in the Gothic style after most of an earlier building was destroyed by fire in 1834. Its architects used nearby Westminster Abbey (started in 1245) for inspiration. Wealthy people in the Victorian period lived in grand houses with space for servants. They would live around garden squares or close to parks to make sure they had clean air. Poor workers had to cram into small terraced houses, often built back to back, in areas near polluting industries.

Victorian school buildings mostly show the influence of the Arts & Crafts Movement, which promoted simple and traditional ways of building. This was formed of architects, artists and writers who complained that mass production was leading to poor quality pieces of design that looked the same. They recognised that factory conditions were also having a negative effect on people's health and wellbeing. They believed that workers could only be happy if they were involved in creative tasks and lived in thoughtfully built communities.

## The architect – who designed the school?

Noel Park School was founded and built in 1889 by the Wood Green School Board, who employed the architect Charles Wall. It is part of the Noel Park Estate, which is a very early example of a 'garden suburb', built on farm land away from the city centre to create a new community that would benefit from cleaner air and greener spaces. Noel Park was built in stages between 1881 and 1913 by the Artizans, Labourers & General Dwellings Company to provide different levels of affordable housing to skilled and unskilled workers. The estate and school are named after the company's chairman, Ernest Noel, MP (1831-1931). About 2,000 houses were built along tree-lined streets and the school, shops and a church were built especially for residents.

Charles Wall was only involved with the school design. He borrowed ideas from Edward Robert Robson (1836-1917), architect to the main London School Board. Robson came up with standard architectural plans, shapes and details that could be adapted depending on the size and needs of a school. He travelled around Europe to research new types of school buildings and published a book called *School Architecture* in 1874 that was read by architects all over Britain. He wrote: "*Architecture is not mere display, it is not fashion, it is not for the rich alone.*"



## The design (shapes, layout, colour, lighting, materials) – what makes the building interesting?

The school stands out as one of the largest buildings on the Noel Park Estate. It was deliberately built at the heart of the community. The school has its own large grounds planted with trees. It is a three-storey brick building that towers over students and passers-by. The combination of red brickwork and white joinery (woodwork) was favoured by Arts & Crafts architects. The gables at the top of the building also show the influence of the movement and its love of cottage-style buildings. The school uses similar materials and features to those used on houses on the estate, including some pretty plaster and terracotta details. The idea was to make working people feel at home in a place of learning.

Classrooms have high ceilings and were designed to be well ventilated and filled with daylight. Large sash windows were deliberately positioned too high for children to see out of when sitting down; it was felt this would be a distraction. Students sat in rows, taking notes from the blackboard on slate tablets. Infants were on the ground floor, while older boys and girls were taught separately on the upper floors (this is why Victorian schools often have separate boys' and girls' entrances).

### Talking points

*Would you have enjoyed a Victorian-style lesson? Classes could be double the size they are today and would mostly involve copying things down and repeating what the teacher said.*

*How do you think children were expected to behave?*

*Do you think your school is an important part of the local community? Does it blend in with its surroundings or stand out?*



# Modernist school case study

Benthal Primary School, Hackney, London, built 1966–67. Architect: Paul Maas

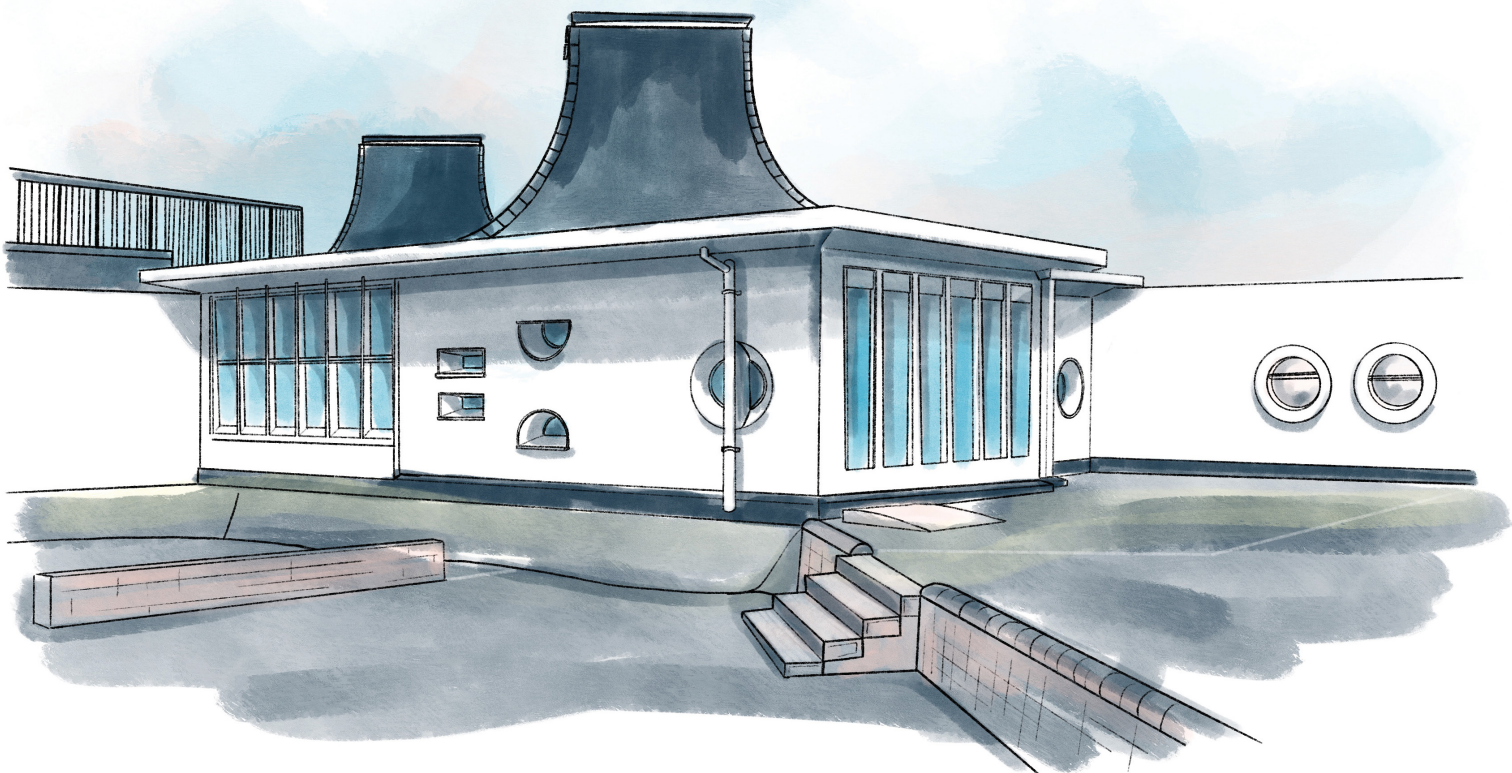
## Historical background – what was happening in education and society at the time?

In the early 1900s there was a move away from Victorian-style education towards 'child-centred learning', and this became even more important in the decades following World War II (1939-1945). Teachers were given greater freedom to experiment with different group sizes and more practical activities. There was also an emphasis on making mainstream schools more accessible, rather than teaching students with special educational and physical needs in separate schools. In 1944 the British government passed an Education Act that required local education authorities to provide free education for all up until the age of 15. They established the three stages of education we know today: primary, secondary and further. They also set out regulations about the standards of school buildings and class sizes.

Britain was very poor following WWII, with some forms of rationing still in place in the 1950s and large urban areas badly scarred by bombing. People had suffered great hardships in the war and the government wanted to improve their quality of life. Education, along with healthcare and housing, was made a priority. Many Victorian school buildings were in disrepair and the number of children requiring school places increased due to a baby boom and people migrating to Britain to help rebuild the country. From 1947 to 1977 the school population increased by over 4.4 million.

## Architectural background – how does the building connect with architectural ideas of the time?

The 1940s to 1970s was an optimistic time in architecture. Governments all over Europe, and many other parts of the world, wanted to replace unhealthy and unsafe buildings with ones that were open to fresh air, daylight and nature. Most post-WWII schools show the influence of the Modern Movement in architecture, which developed in the 1920s and 30s with a common mission to improve people's lives through good design. Architects wanted to use new technologies in positive ways, having seen the destruction caused by war. Each country had its own version of Modernism, but some shared ideas were:



- Clean lines and simple shapes (no unnecessary decoration or details)
- Large horizontal windows (maximising daylight)
- Connecting with nature (roof gardens, terraces and courtyards)
- Flexible/open plan (a steel frame holds the weight of the building rather than its walls)
- Visible structure (it is easy to tell how the building stays up)

Our built environment today is still influenced by Modernist architecture. Britain was slow at first to take up the ideas of forward-thinking architects like Le Corbusier (1887-1965) in France or the famous Bauhaus design school (1919-1933) in Germany. It was only after WWII that the government and councils came to appreciate the time and cost efficiency of new approaches to building. Parts could be made in factories and simply put together on the building site.

## The architect – who designed the school?

Paul Maas worked as an architect for the Greater London Council. He worked on Benthall Primary School, Hackney, between 1966 and 1967. It was his first school project and he was given just six weeks to come up with the design! There was a slightly earlier infant school building already in place. This was built between 1947 and 1949 in a Modernist style to replace an earlier Victorian building that had suffered bomb damage. Maas did not want to just repeat the plain, rectangular shapes of this building. With limited time, he turned to his own family for help:

*"I asked my four children what they liked and disliked about the various schools which they were attending. I also tried to recall the kinds of structures that had excited me when I was a child. The result was a classroom designed on a pinwheel plan that related to the small group style of teaching, with a form that tried to symbolise the archetypal structures of a cave and a tent [...] Each classroom had its own protected piece of nature (its courtyard) and each was scaled to the height of 5-7 year olds ... I wanted Benthall to feel like a children's world in which adults were invited."*

(Quoted in E. Robinson, *Twentieth Century Buildings in Hackney*. London: Hackney Society, 1999)

## The design (layout, shapes, colour, lighting, materials) – what makes the building interesting?

The layout of the school building by Paul Maas looks a bit like the sails of a paper windmill from above (what he described as a pinwheel plan). He created eight self-contained teaching areas to suit different group sizes, with sinks for messier activities. There is also a large hall space, as would be required for any school. The main learning areas were intended to make the children feel cosy and safe, like being in a cave or a play den. Light enters through skylights and a variety of smaller sized windows in the walls. These are positioned at children's eye level.

From outside, children are able to see which areas are the 'home bases' because they have tall roofs that resemble tents. The unusual roof shapes have also been compared to Moorish (North African) architecture. While these were made from concrete reinforced with steel, the walls were constructed with more traditional brick. This was perhaps chosen for its affordability and good insulating qualities (stopping heat seeping in or out). It was an appropriate material because this part of London had once been brick fields. Connection between indoor and outdoor space was important. Between his building and the 1940s building, Maas created a courtyard planted with trees and wild plants. The main play areas run over different levels with snaking hollow brick walls.

### Talking points:

*Paul Maas was inspired by tents and caves. Can you think of another structure that would make children feel happy and safe? Perhaps something you play in or something an animal lives in.*

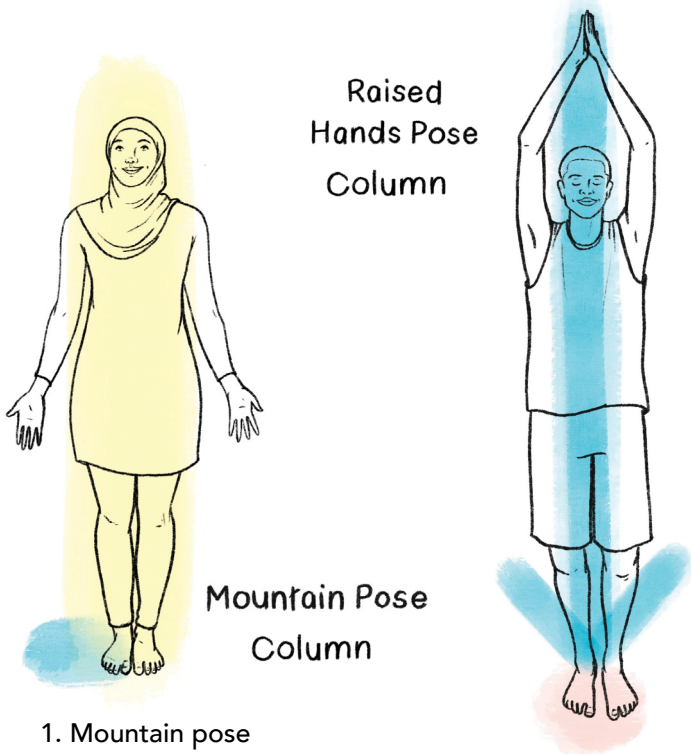
*What are your favourite activities in school? How could the architecture help you to carry these out?*

*Modernist architects placed lots of importance on fresh air, natural light and outdoor spaces (there were even experiments with open-air schools). Are these things just as important today?*

# Architecture yoga

## Understanding elements of construction and the forces that act on buildings

To think like an architect, it is important to understand how buildings stand up. The following activity introduces the forces that act on them for yourself. Some of these features will be relevant to your school building. As you try out the poses, think of buildings from different parts of the world and from history to see what elements of construction they use (Google Earth).

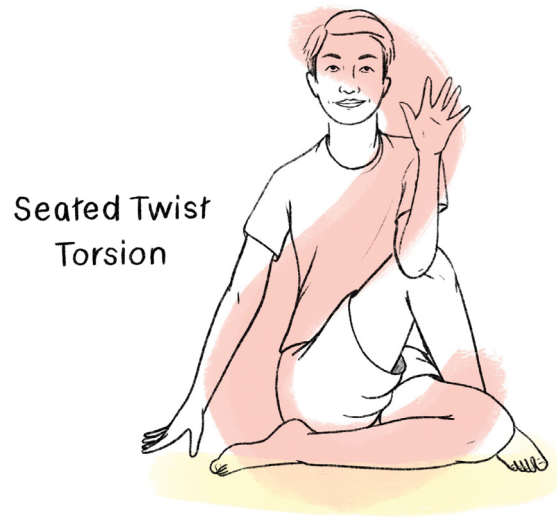


### 1. Mountain pose

Stand with your feet and legs together, arms at your side and palms facing out. Stand as straight as you can. Imagine you are a column, feel the weight of your body pushing down to the ground through your feet.

### 2. Raised hands pose

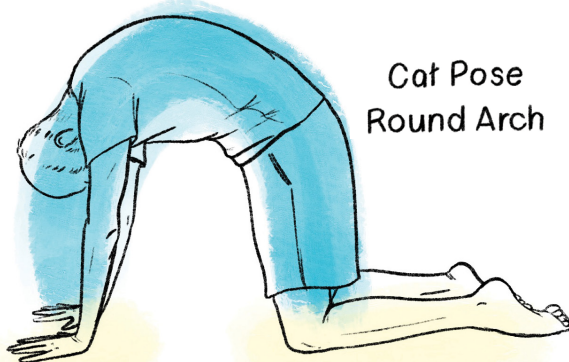
Take a deep breath and stretch your arms above your head. Place your palms together and gently tilt your head back. Exhale as you release the pose, bring your arms back to your sides and face forwards again. Repeat several times.



### 3. Seated twist

In order to stay up, buildings have to be able to withstand various forces acting on them. A force is any push or pull. Gravity is a force that acts on all structures; it constantly pulls them towards the earth's centre. Architects also have to consider torsion (forces that twist structures, such as wind).

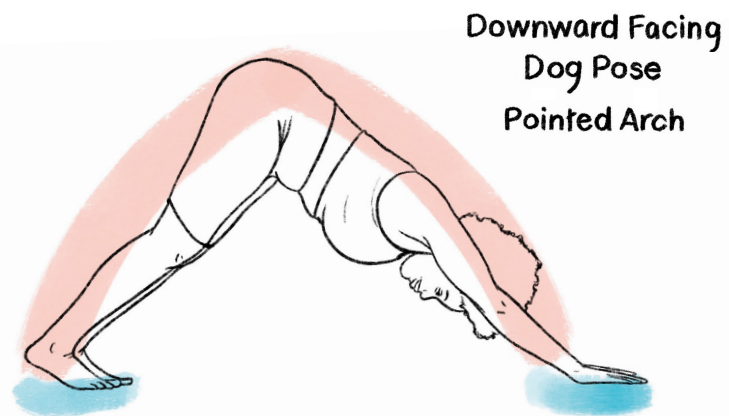
To experience a gentle torsion, sit on the floor with your legs extended in front of you. Bend your right knee and cross your right leg over your left thigh. Bend your left knee and bring your left foot back underneath your right thigh. Reach back behind with your right arm and twist to the right with your left elbow tucked over your right knee. Take slow breaths and every time you exhale, twist a little further to the right. Repeat the pose the opposite way.



### 4. Cat pose

Arches carry loads (weights and pressures) around openings.

To make your body into a round arch, stay on the floor, now on your knees and palms. Have your knees hip-width apart, and your palms directly below your shoulders. Take a deep breath, then exhale while slowly arching your back and lowering your head. As you inhale, relax your back and look up. Repeat.

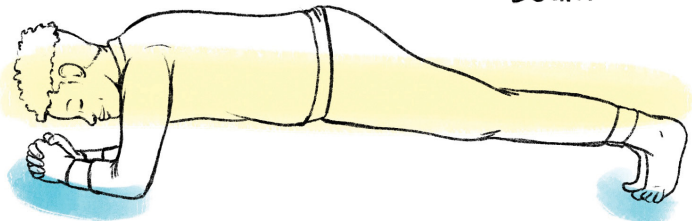


### 5. Downward facing dog

Now try to form a pointed arch. Reposition yourself so that the soles of your feet are on the ground. Slowly straighten your legs and push down onto your hands, spreading out your fingers. Raise your hips to a height you are comfortable with. Take a few breaths and then slowly lower your knees back to the ground.

main elements of construction, such as columns, arches and beams, in a way that you can experience the forces. Think carefully about what might be supporting the floor, walls and ceiling. Afterwards, you could look up (Earth is a helpful resource for this).

**Dolphin Plank Pose  
Beam**



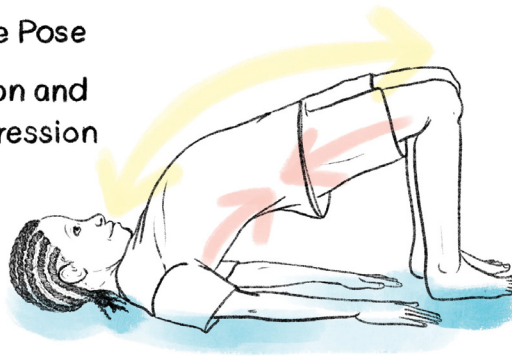
### 6. Dolphin plank pose

A very simple form of construction is a beam across two posts.

Begin on your hands and knees. Lower your elbows so that they are directly underneath your shoulders and bring your upper body weight onto your forearms. Breathe slowly and evenly. Step back with your toes and try to form a straight line with your body. This is tough! Which parts of your body are under the most stress? At which points is the load being transferred to the ground?

**Bridge Pose**

**Tension and  
Compression**



### 7. Bridge pose

The main forces that act on a structure or structural component internally are *tension* (a force that tries to stretch materials apart) and *compression* (a force that squeezes materials together).

These forces can be better understood through a simple bending pose. Lie on your back as comfortably as possible. Bend your knees and place the soles of your feet flat down on your mat. Walk your feet inwards and lift your hips towards the ceiling. Your feet should be aligned and hip-distance apart. Try to hold the pose for 5 deep breaths.

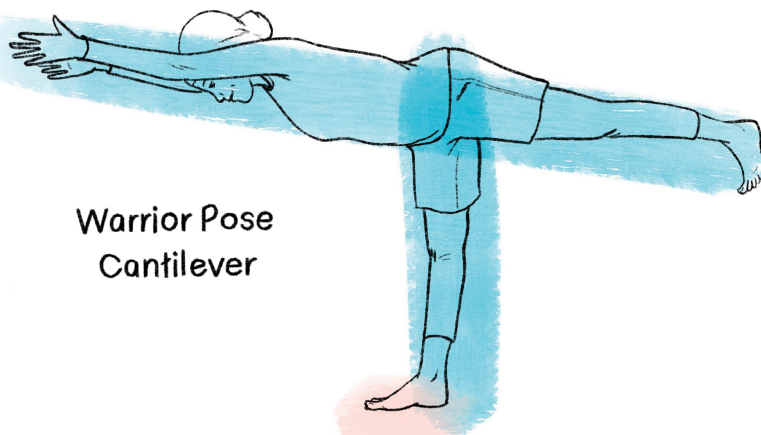


**Extended  
Hand-to-Big-Toe  
Pose  
Brace**

### 8. Extended hand-to-big-toe pose

In architecture it is sometimes necessary to transfer forces acting on a weak point of a structure to a stronger point by adding an extra component, such as a beam or a brace (a diagonal support).

Stand in Mountain pose. Raise your right knee towards your chest and try to grab your big toe with the first two fingers of your right hand. Look straight ahead. Carefully straighten out your raised leg and place your left hand on your left hip to help steady yourself. Your right arm is helping to transfer forces acting on your right leg back to your core. Take a few slow and steady breaths before returning to Mountain pose. Repeat with your other leg.



**Warrior Pose  
Cantilever**

### 9. Warrior pose

A cantilever is a rigid, horizontal structure that is only anchored/supported at one end.

To make one with your body takes good balancing skills! Stand in Raised hands pose. Take a deep breath and as you exhale slowly lean forward extending one leg back. Relax your supporting leg slightly and try to create a straight line from your raised heel to the tips of your fingers. Hold for a few breaths and repeat with your other leg.

Finally, the class should divide into two rows standing opposite each other. Raise your arms and place your palms against those of the person opposite you to form an arch. Gently lean towards each other so that you can feel your arms are in compression with the other person. As a class you will have made a tunnel. Can you think of any other structures you could make as a group?

# Measurements and scale in architecture

Maths often comes into architecture, especially measurements. Architects have to make sure that spaces and objects are scaled to suit the users of their buildings and make daily tasks as comfortable as possible. For example, the tables and chairs in your classroom have been scaled for the height of someone your age. Your teacher's desk and chair will be bigger. Incorrect measurements could be disastrous – imagine having to crawl through a tiny door or leap up massive stairs!

Making careful measurements is important for safety, to avoid people hurting or straining themselves. It is also essential for making inclusive buildings that everyone can use and enjoy, for instance, making sure that someone using a wheelchair can easily move around.

## Measuring activity

Work in pairs to estimate and then measure each item. Start by estimating the length of a pencil and check to see how close your answer is. You can then use this as a rough guide for estimating the next item – how many pencils high is a chair? Carry on in the same way, checking and comparing your measurements as you go along.\*

	Estimated measurement in cm	Actual measurement in cm	The difference between your numbers in cm
Length of a pencil			
Height of a chair			
Height of a table			
Length of a table			
Height of a student			
Height of a teacher			
Height of a door			
Width of a door			

## Scale figures activity

The measurements involved in whole buildings are huge, so how can an architect work with these on a sheet of paper or on a computer screen? The answer is that they scale down the buildings – typically making them 100, 50 or 25 times smaller than they are in real life. These are units that make division and multiplication a bit easier.

These figures are at the following scales:

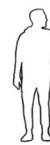
1: 100 – multiply the height by 100 to get the real height

1: 50 – multiply the height by 50 to get the real height

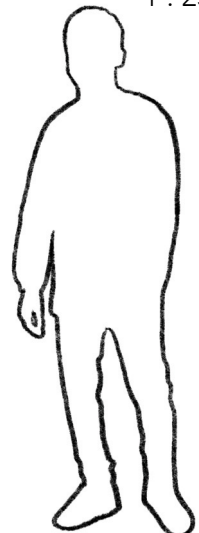
1: 25 – multiply the height by 25 to get the real height

Photocopy and cut out the scale figures and on a separate sheet of paper draw everyday objects at a size the people could comfortably use, for example, a chair, a table, or a bicycle.

1 : 100



1 : 25



1 : 50

# Introduction to plans and elevations

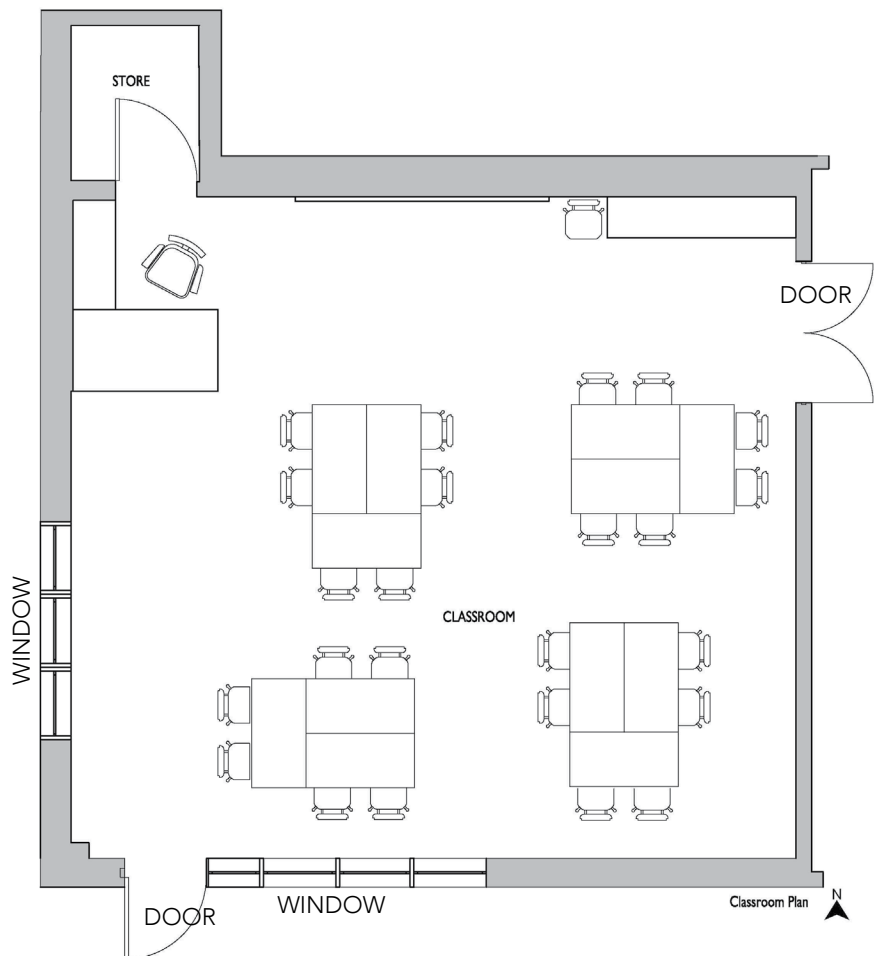
Plans and elevations are scale drawings that architects use for developing and communicating their ideas. A plan shows how a 3D space looks from above, a bit like a map. An elevation is a view of a space when it is looked at straight on, so just one wall of a room or one side of a building.

## Draw a plan of your classroom

Pretend that the roof has been lifted off your classroom and you are a bird looking down on it! On a sheet of A4 paper draw a rough outline of the room – is it a square or a rectangle? Are there any oddly shaped corners? Use as much of the page as you can. This drawing will not be to a particular scale, but, as for the figures activity, try to make elements in proportion to each other.

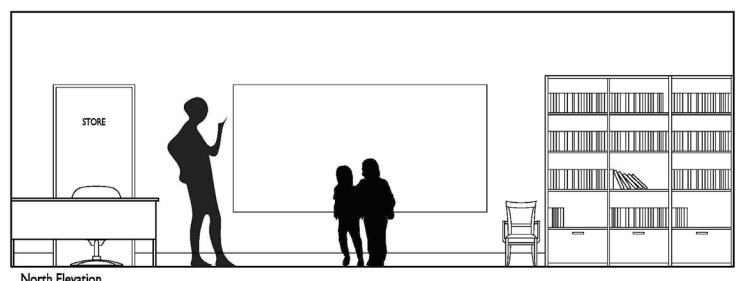
Add in key pieces of furniture and important features such as doors and windows. See the example for how architects draw these. Architects will often use symbols to stand in for objects that are difficult to draw in plan-view, like windows.

You can add a key to make it even clearer what the objects are. Architects will always title their drawings and show the direction of north (so that they know the direction of sunlight).



## Draw an elevation (one wall) of your classroom

Take a new sheet of A4 paper and have it landscape orientation. Draw the front wall of your classroom – you only need to draw objects that are on the wall or directly by it. Think carefully about the height of the whiteboard in relation to the floor and ceiling. Then consider how high a table and chair are in relation to this. You can draw some people if that helps!



\*Measuring tip – if you do not have a meter ruler or tape measure to hand, you can use string, ribbon or wool. One person can hold the end of the string and the other person can use a felt tip pen to mark the appropriate length/width/height. Note that you will need a different colour pen for each item so as not to mix up your measurements! You can then measure the string using a 30cm ruler – use a pencil and paper to note down how many 30cm sections you count plus any extra centimetres.

# Architecture and conservation

The Victorians built on a large scale and with great speed. The architecture of this time period is still very visible in our towns and cities. By the middle of the 1800s, some people were becoming worried that architecture of the past was being lost and forgotten. There were no laws to protect old buildings and they could simply be knocked down and replaced.

The artist and writer John Ruskin (1819-1900) was one of the first people to publicly speak out for the value of old buildings. The Courtauld Gallery owns a drawing he made in preparation for illustrations to his book *The Stones of Venice* (three volumes, 1851-53). While visiting the Italian city, he sketched the leaves from the capitals (upper part) of columns on a famous palace. He loved that each one had been carved by hand and inspired by nature.

## Learning from the past

For Ruskin, architecture of the past had lots to teach us about working creatively and using our imaginations. A feature like a capital did not have to be perfectly carved or made from an expensive material; it was more important that someone had enjoyed making it. Ruskin encouraged the use of local and natural materials wherever possible. His ideas were very influential on the Arts & Crafts Movement (see Victorian school case study). Today, they seem especially valuable and relevant as we must make our architecture and lifestyles more sustainable.

*"When we build, let us think that we build forever. Let it not be for present delight nor for present use alone. Let it be such work as our descendants will thank us for."*

John Ruskin, *The Lamp of Memory, The Seven Lamps of Architecture*, 1849

In 1884 Ruskin gave a talk called "The Storm Cloud of the Nineteenth Century", which can be considered one of the earliest warnings against climate change in Europe. Ruskin noted the effects of fossil-fuelled industries on cloud formations. It is now more important than ever to design buildings that have a minimal impact on the environment. Architecture from times before the widespread use of electricity and air conditioning can offer useful lessons in how to build in ways that make clever use of natural light, ventilation and shading.

## Protecting the past

The role of an architect often involves adapting and extending existing buildings. Sometimes they will conserve buildings that are rare examples from the past and have special historical value. To conserve architecture means to protect a building in a way that will allow it to keep its character and make it last for years to come. Ruskin's efforts to save old buildings were expanded on by charities like SPAB (Society for the Protection of Ancient Buildings) and the National Trust.

Conserving a building can be more expensive than knocking it down and starting again. There may also be challenges making an old building suitable for current-day needs. For these reasons there are often debates around what to do with older buildings. In 2015, students, parents and teachers successfully protested against the local council's plans to demolish Benthall Primary School (Modernist school case study). Buildings do far more than provide shelter and spaces for daily activities. Ruskin suggested that old buildings have voices *"which we feel in walls that have long been washed by the passing waves of humanity."* They hold important memories for communities and individuals.

- People in the Victorian period were already worried about important old buildings being destroyed and about people's quality of living.
- Today we have charity and government organisations that help to protect buildings that are considered important.
- There are challenges in working with old buildings, but also much to learn from them, such as using local and natural materials.

## Talking points

*In what ways do you think nature could provide inspiration for an architect?*

*How can we design buildings that do not harm the environment?*

*Which buildings from our own time would you want to protect for the future?*





Leafage of the Venetian Capitals, c. 1849-52, John Ruskin (1819 - 1900), Graphite, pen and grey ink and watercolour on wove paper, 18.4 x 14.5 cm © The Samuel Courtauld Trust, The Courtauld Gallery, Lond

# A school inspired by a story

Contemporary case study: In 2016 London based architecture practice Delve Architects, alongside De Rosee Sa, designed a new dining space and after-school club for Prestwood Infant School in Great Missenden, in Buckinghamshire.

Text by Edward Martin, Director Delve Architects

## Background to the project

The brief set was to build a new dining hall space that could seat 96 children, as part of the government's Hot Dinners initiative. It would also provide a much needed space for the early morning and after school clubs. Delve Architects were approached to come up with a fun, playful concept for a new dining hall, while maintaining a focus on the school's small construction budget.

## The design

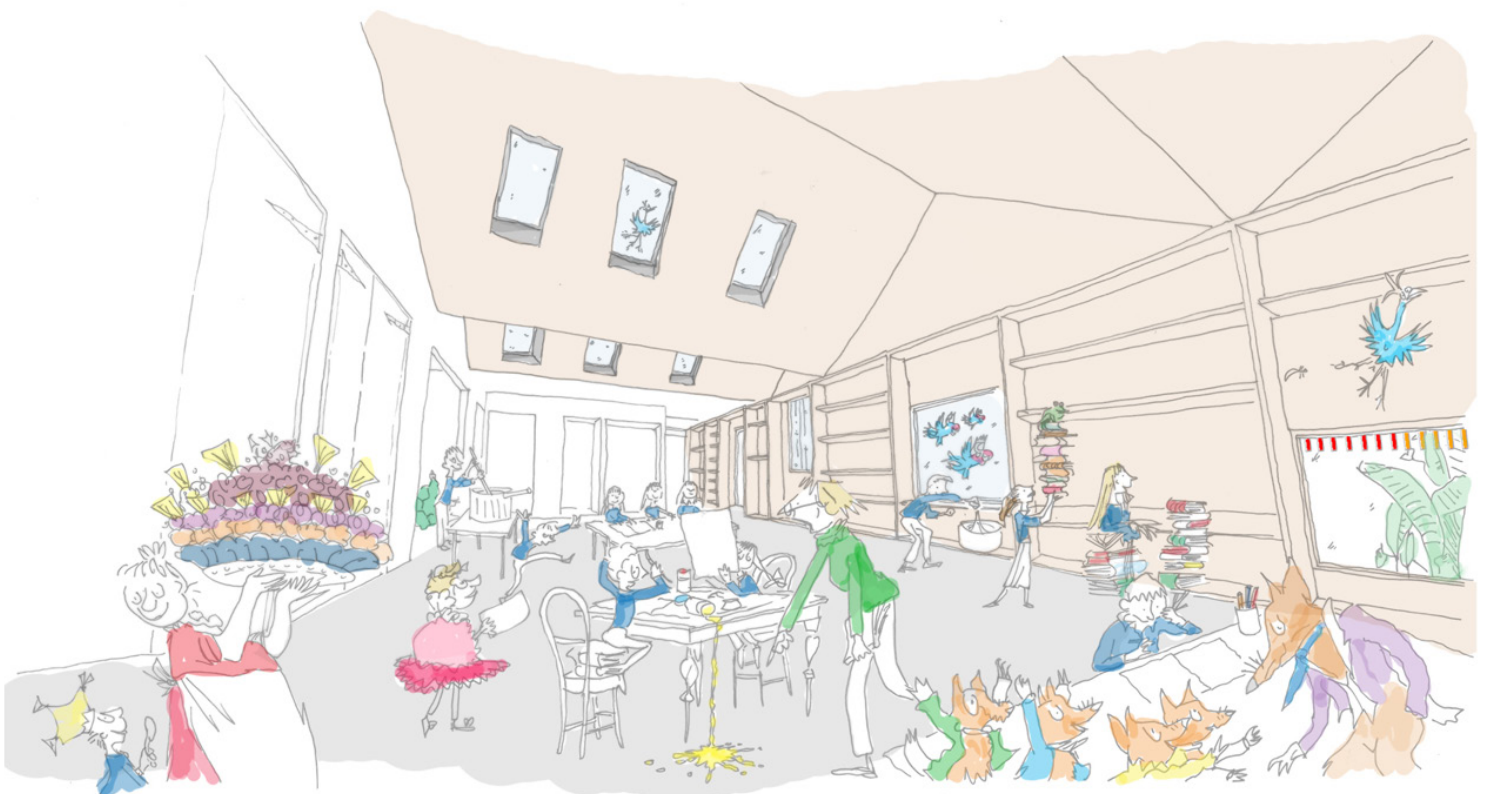
After a site visit and experiencing first-hand the creative nature of the school, an idea was born from a connection with children's author Roald Dahl (1916-1990), who had lived in the area and loosely based his character Miss Trunchbull from *Matilda* on a former head teacher of the school. A passage from *Fantastic Mr Fox* became our point of departure:

*"We will make," said Mr Fox, "A little underground village, with streets and houses on each side – separate houses for badgers and moles and rabbits and weasels and foxes. And everyday I will go shopping for you all. And everyday we will eat like kings."*

The single storey timber framed building was designed to work alongside the small project budget, with exposed plywood and a concrete floor internally. Externally, a brightly coloured timber rainscreen echoed the roofline of the main school building to create visual interest for the children. The design team focussed on using standard off-the-shelf materials to limit the amount of waste generated during the building process.

*"I am delighted that the excitement continues daily, the children love the building and have found every possible space and area to play in. Children will always learn more effectively if they are inspired and happy, the Little Hall truly does this for our children at Prestwood Infant School."* Nicola Raheer, Head Teacher in 2016

The Little Hall has been awarded two Regional RIBA Awards. The Royal Institute of British Architects was founded in 1834 for the advancement of architecture. The RIBA website [architecture.com](http://architecture.com) is a great place to find out about the best architecture in the UK and around the world. It also covers the different career paths to becoming an architect.





## Talking Points

What does the architecture of the Little Hall make you think of? Do you have a favourite story that could provide inspiration for a building?

What role does colour play in the design? Do you think there should be more colour in architecture generally?

What do you think are the most important things to consider when choosing the materials for a building? How do materials appeal to our senses other than sight?

## Research activities

- **Investigate materials:** choose a building material to research. Research its history and new developments. Some exciting innovations include: pollution-absorbing bricks, self-repairing concrete, translucent wood, power-generating glass and light-emitting cement!
- **Test out technology:** try out SketchUp 3D modeling software (free). There is a version for primary schools with activities. Share any online architecture experience you already have with your class and give some tips (perhaps you're a master of Minecraft).
- **Explore careers:** find out what you can about the different people architects work with, such as engineers, surveyors, interior designers, lighting designers and landscape gardeners.

All images of the project courtesy of Jack Hobhouse for Delve Architects

# Designing a school for the future

## The brief:

Design a primary school from scratch and present your ideas as an architectural model. This activity can take place over one school day or several sessions depending on the level of detail desired. The architecture should be:

### Inspiring for learning

- Create spaces with lots of natural light and fresh air
- Design generously sized rooms with flexibility for different types of learning
- Use colour and texture to stimulate the senses
- Consider outdoor spaces for learning and creative play

### Practical

- Decide how many classrooms are needed; most schools also have a library and ICT room
- Allow the most space for the hall (for dinners, assemblies, games and community events)
- Have clear layouts and good overall organisation
- Mark out grass sports pitches and hard games courts for PE

### Welcoming and inclusive

- Provide areas for students to socialise and support each other (e.g. buddy bench)
- Make sure that everyone is able to fully participate in school life (accessible design)
- Consider incorporating health and wellbeing spaces
- Keep students safe and secure

### Sustainable

- Help the environment as much as possible (provide recycling facilities, bike storage, etc.)
- Include outdoor spaces that could be used to teach students about environmental issues and provide opportunities to study nature (e.g. habitats for animals)
- Use trees to make the school buildings and grounds more pleasant
- Make school dinners healthier by having allotment (small garden) areas for growing food

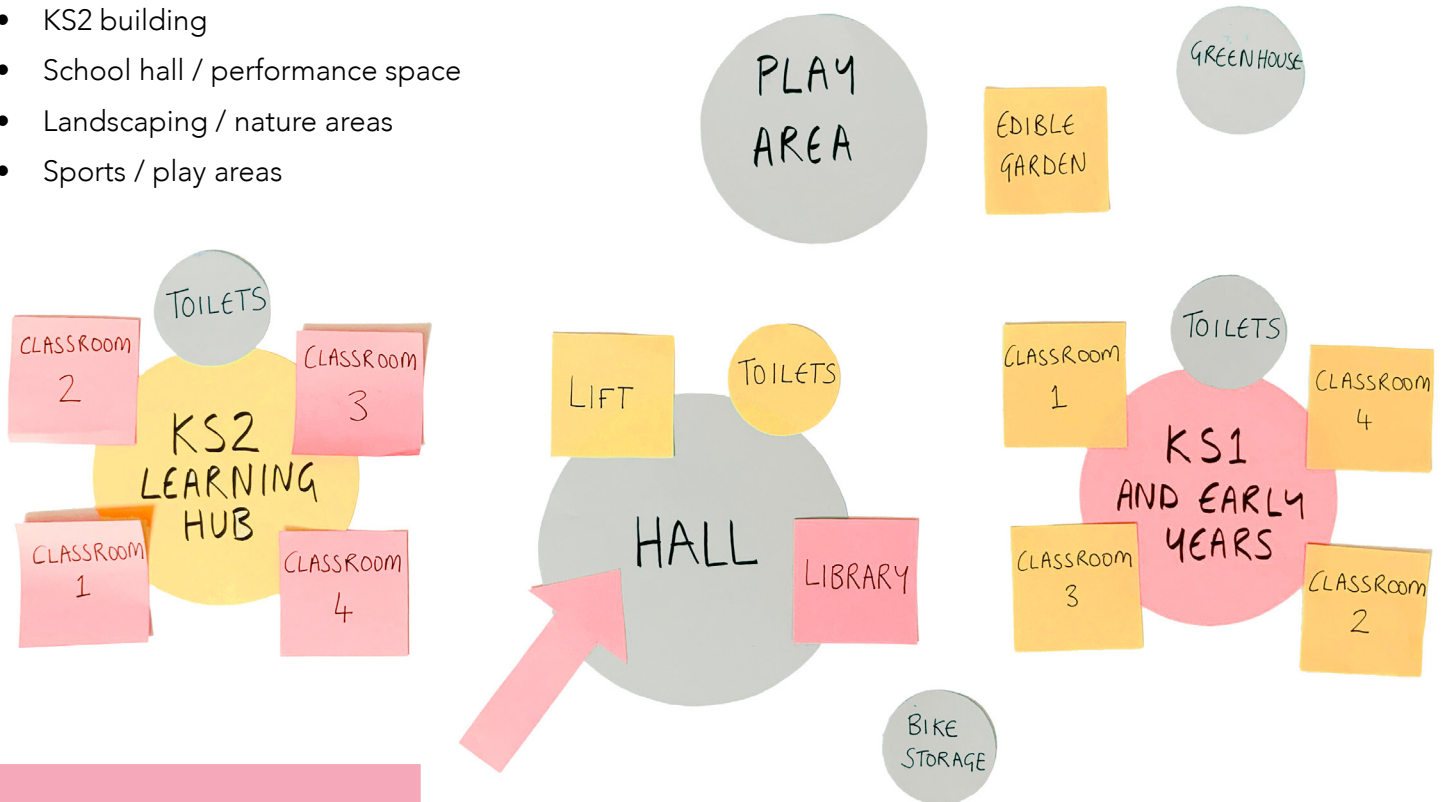


## Step 1: Make a master plan

As a class, discuss the four main requirements of the brief and how these could be met. Students can submit ideas on Post-it notes or scraps of paper to be read out by the teacher. Once the main features and facilities have been decided on, the class can gather around a table or sit in a circle on the floor to agree on an overall plan. The easiest way to do this is to indicate each learning space / activity area as a paper circle and test out different arrangements.

In preparation for the practical activity, tables can be assigned particular areas to work on:

- KS1 and Early Years building
- KS2 building
- School hall / performance space
- Landscaping / nature areas
- Sports / play areas



## Step 2: Make a model

Architects use models to communicate their ideas in three-dimensional form. There is no set approach for making an architectural model. It is an opportunity to experiment with colour, form and texture. Here are some tips:

- Have a good variety of materials to hand. Bring items from home: packaging materials, cardboard tubes, small boxes (cereal boxes and smaller), clear plastic fruit boxes, lollipop sticks, egg cartons and yoghurt pots. Also have materials such as: A3 coloured paper, tissue paper, pipe cleaners, blue tack, scissors, glue sticks, masking tape, paper straws and string.
- It is important that everyone works on the same scale. 1:50 would be a sensible size. Cut out some examples of 1:50 scale people to use for guidance.
- Print some cuboid nets. There are plenty of templates that are free to download from the Internet. These can be helpful building units if you are short of ready-made boxes.

## Step 3: Share your ideas

Once the model is fully assembled, each table can note down some key points about the design to share with the rest of the class. A spokesperson can point to details on the model and provide extra information about elements like materials and services. Students could give a presentation to other classes and even parents. The model could form part of an exhibition with drawings and labels to fully explain the architectural vision behind it.

# Further exploration

## Inspirational projects:

Fuji Kindergarten, Tokyo, Japan, by Tezuka Architects, 2007. An oval-shaped roof deck allows children to play and run endless laps around it.

Oak Meadow Primary School, Wolverhampton, by Architype, 2011. One of the first three primary schools in the UK to receive Passivhaus certification in February 2012 (natural ventilation and heating/cooling).

Adventurous Global School, Sneung, Cambodia, by Orient Occident Atelier, 2017. A welcoming building with gridded walls that double as a jungle gym.

Children Village, Formoso do Araguaia, Brazil, by designer Rosenbaum and architects Aleph Zero, 2017. A boarding school complex built from earth blocks and wood on the edge of a rainforest. Named the world's best new building by RIBA in 2018.

Sabou School, Burkina Faso, by 3RW Arkitekter, 2018. A circular school with a central courtyard. The outer wall is painted by local craftspeople and reflects local traditional pattern identity.

Alfa Omega School, Tangerang, Indonesia, by RAW Architecture, 2019. A bamboo building raised 2.1m on stilts above swampy ground. The design gives children a sense of closeness to nature.

Blossom School, Chengdu, China, by Hong Kong studio Karv One Design, 2019. An experimental learning and play space with curved walls, pastel colours, a giant slide and ball pit.

Golden Lane Estate Play Space, London, by architecture studio muf, 2019. Redesign of an inaccessible and under-used sunken play area for under-fives contained within a Modernist estate.

'Learning Scapes' for St Johann Primary School, Basel, by Swiss design studio ZMIK, 2019. Three corridors transformed into flexible learning spaces designed to promote a sense of wellbeing.

Built-in furniture designs for Tel Aviv primary schools, Israel, by local designer Sarit Shani Hay, 2020. Colourful wooden pieces to promote collaboration, play and rest.

The Rajasthan School, India, by Sanjay Puri Architects, 2020. Towering red walls provide shade and natural ventilation for this school built in a hot climate.

'Pylonesque' classroom, Ban Wang Toey School, Uthai Thani, Thailand, by architecture studio Pareid and students from Chulalongkorn University, 2020. A brightly coloured and open-walled classroom designed to harvest rain water.

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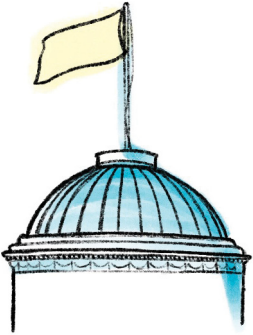
### Contemporary Schools

*Creating excellent primary schools*. London: The Commission for Architecture and the Built Environment, 2010. [https://www.designcouncil.org.uk/sites/default/files/asset/document/creating-excellent-primary-schools\\_2.pdf](https://www.designcouncil.org.uk/sites/default/files/asset/document/creating-excellent-primary-schools_2.pdf) [accessed May 2020].

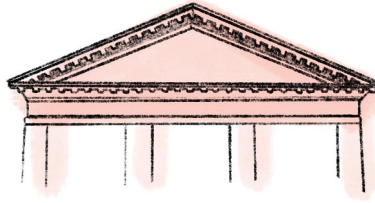
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# Glossary

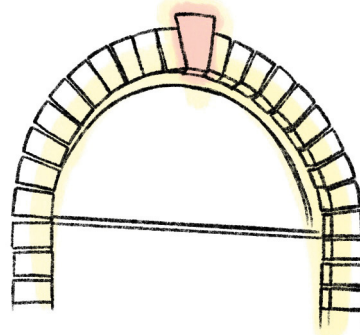
## Neoclassical buildings



Dome



Pediment

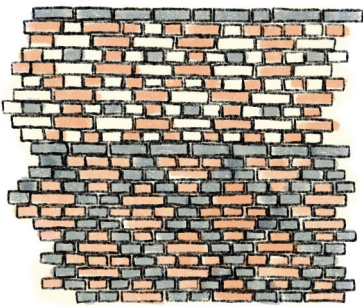


Round Arch  
with keystone

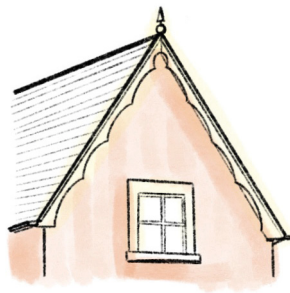


Corinthian  
Column

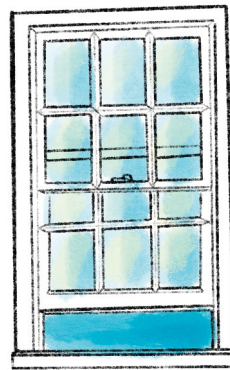
## Victorian buildings



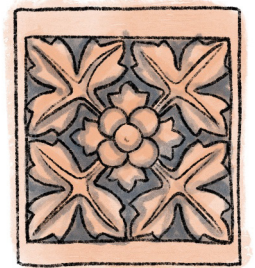
Red Bricks  
in decorative patterns



Pitched Roof  
with Gable

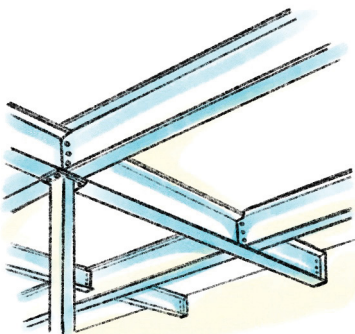


Sash  
Window

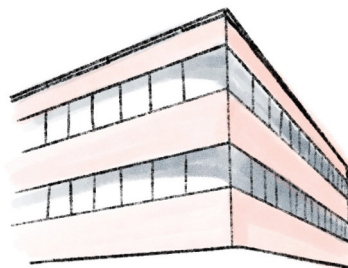


Terracotta Relief

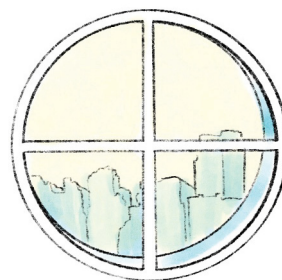
## Modernist buildings



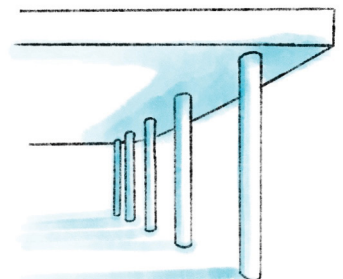
Steel Beam



Ribbon Window



Porthole Window



Piloti  
thin steel or reinforced  
concrete supports

