MAYOR OF LONDON

THE LONDON CURRICULUM

KEY STAGE 2

REBUILDING LONDON

THE LONDON CURRICULUM

PLACING LONDON AT THE HEART OF LEARNING

The capital is the home of innovations, events, institutions and great works that have extended the scope of every subject on the school curriculum. London lends itself to learning unlike anywhere else in the world. The London Curriculum aims to bring the national curriculum to life inspired by the city, its people, places and heritage.

To find out about the full range of free resources and events available to London schools please go to:

www.london.gov.uk/london-curriculum.

I have someone I'd like you to meet...
This is Fen the Fox from Fenchurch Street.
He likes to creep about the city,
To inspect and explore the buildings so pretty.
Join him on his journeys to discover
The secret world of London uncovered.
Look out for him along your way,
He might have something interesting to say!

HOW TO USE THIS PACK

This pack is designed to be flexible, to give you control over what you teach and when. The resources in this learning pack all sit within the Rebuilding London theme and promote cross-curricular teaching.

This learning pack includes activity plans which address learning objectives across the following subject areas:

- **Dance** (Topic: The building blocks of dance: Hand Jive)
- **Computing** (Topic: Building through coding)
- **Geography; History** (Topic: World War II and the Great Fire)
- **Geography; Citizenship; Literacy**
  (Topic: Observing and improving local buildings)
- **Design & Technology; Geography; Science, Art & Design**
  (Topic: Building a sustainable London)

This learning pack is designed so that you can pick and choose between the topics; you're free to teach whichever topics you'd like and in whichever order you'd like. Each activity plan displays an approximate duration time and highlights specific KS2 learning objectives relating to the activities described.

The activity plans relating to specific topics often follow on from each other, so we'd recommend that you teach these in succession. However, you may choose to teach different topics in whichever order you wish, for example, you might want to teach Building a sustainable London before The building blocks of dance: Hand Jive.

The topic-based activity plans follow a similar structure to the lesson plans produced in our Key Stage 3 resources. There are three distinct phases of learning:

- **Discover**
  (Presenting and analysing background information relating to the given topic)

- **Explore**
  (Contextualise learning from the Discover activities by exploring the concepts in action through a London-based visit)

- **Connect**
  (Task-based activities which connect the background information analysed in the Discover activities with the contextual understandings gained on the visit in the Explore activities)

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BUILDING A SUSTAINABLE LONDON

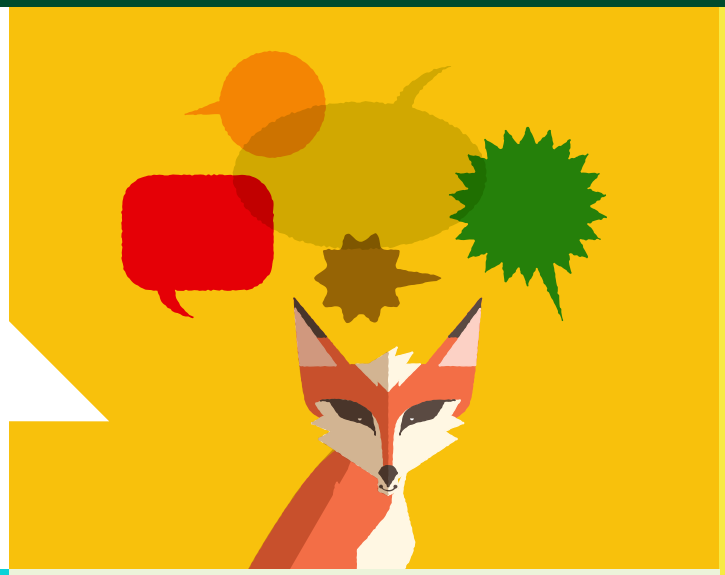
Topics

DESIGN & TECHNOLOGY

GEOGRAPHY

ART & DESIGN

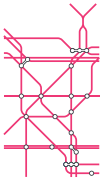
SCIENCE



Learning objectives for pupils:

DESIGN & TECHNOLOGY

- To develop design criteria for innovative, functional, appealing buildings and artefacts that are fit for purpose
- To develop and communicate their ideas through discussion, sketches, sections and diagrams.
- To evaluate their ideas and consider the views of others to improve their work.

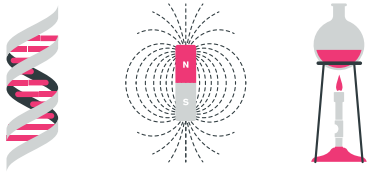


GEOGRAPHY

- To understand human geography: the distribution and use of natural resources
- To understand geographical similarities and differences through the study of architecture in cities within the United Kingdom, Europe and others regions such as North and South America or Asia.

ART & DESIGN

- To learn about great Architects and designers in history and contemporary times.
- To improve mastery of art and design techniques, including drawing, painting and sculpture with a range of materials.



SCIENCE

- To recognise that some mechanisms allow a smaller force to have a greater effect including the generation of energy. Wind turbines, solar energy or water movement to produce electricity.
- To understand about everyday materials on the basis of their properties and original source i.e. Bricks comes from soil, plastic from oil, cotton, leather, glass, wood etc.
- To understand that some changes result in the formation of new materials, and that this kind of change is not usually reversible.

BUILDING A SUSTAINABLE LONDON

BUILDING A SUSTAINABLE LONDON

DISCOVER

Duration: 60–90 mins

Setting the scene

Explain to pupils that, in this unit, they will learn about examples of architecture that are helping to protect the environment; buildings that are testing ways to produce energy rather than consuming it; and, ways to use land in a more efficient way.

Children will have the opportunity to think about the transport system in London and to share their design ideas for a more efficient and sustainable city of the future. This unit will empower the students to have aspirations for improving and engaging with the built environment around them.

Begin the lesson by recapping on what students learned from the previous topic, *Observing and improving local buildings*. What is the role of the Architect? What is the process for planning a new building?

Activity 1: Sustainable architecture

Share Fact sheet 1: Learning about sustainability (page 86) with students.

Once you have read the fact sheet, invite suggestions from pupils to define the word 'sustainability.' What does the word mean? How can we build sustainably?

Some definitions could include:

- Building for current needs, without compromising the needs of the future
- Having care for the environment
- Preserving the environment for future generations
- Not being greedy with energy demands
- Only using what we need and no more
- Having care for the plants and animals that we share our planet with
- Not using resources that cannot be replaced

To encourage students to engage further with the planning aspects of sustainable building, share Fact sheet 2: Key concepts in sustainable building (page 87) with pupils and run through the various concepts explored. Explain that they will need to be aware of these concepts when undertaking their connect activity.

BUILDING A SUSTAINABLE LONDON

DISCOVER

Activity 2: Architecture is everywhere

Display some examples of sustainable buildings/'ecobuildings' on the interactive whiteboard for the class to view. Create a collage of photographs on the board if you can.' Discuss the eco elements of the buildings that they can see on the board.

Examples of artists using the collage technique include:

- Anna Hoch, a female german artist and member of the Dada group, who was pioneer and expert in the photo montage technique.
- Eduardo Paolozzi a Scottish artist. You can find his art work at Tottenham Court Road Tube Station.
- Marianne Brandt, a student and teacher at the Bauhaus, the revolutionary german art school.
- Archigram, a revolutionary group of Architects formed at the Architectural Association School of Architecture.

Painters such as:

- Pablo Picasso
- Braque
- Peter Blake.

Then ask students to create their own sketch collages in their sketch books, choosing elements of the buildings displayed on the board for inspiration. These collages must display sustainable/eco elements and be imagined for the city of London.

LITTLE ARCHITECT COLLAGE. RATHFERN SCHOOL, YEAR 4.
Photo: Dolores Victoria Ruiz-Garrido

BUILDING A SUSTAINABLE LONDON

EXPLORE

Investigating local architecture

For the explore visit, we recommend that you visit one of the following buildings:

One Embankment Place.

Architect: TP Bennett
1 Embankment Place WC2N 5NP

ONE EMBANKMENT PLACE
Michael Garnett 2012, Flickr

One Embankment Place is a commercial office building constructed in the early 1990s. It was recently renovated and achieved very high levels of sustainability, thanks to some of the following design decisions:

- The Biofuel they use is sourced from locally collected and refined waste vegetable oil!
- The staircase in the centre of the building is to promote vertical movement without the use of lifts.
- Waterless urinals, rooftops and vertical gardens add beauty and take care of the urban fauna and flora.

Stock Orchard Street

Architect: Sarah Wigglesworth
Stock Orchard St N7 9RW

STOCK ORCHARD STREET
N19± 2013, Wikipedia Commons

This is a private house and Architects' office. It is a very interesting project with straw and recycled newspapers in the walls. Sarah designed a system to harvest rain water and she designed a natural ventilation system too.

www.swarch.co.uk/work/stock-orchard-street/

BUILDING A SUSTAINABLE LONDON

EXPLORE

Tate Modern
(Extension 1 & Extension 2)

Architects: Herzog and De Meuron
Bankside, London, SE1 9TG

This is a story of changes and additions. The Tate modern was a power station and for some time was threatened with demolition, however a clever decision preserved it and today it is one of the most iconic buildings in London. Herzog and De Meuron, Architects from Switzerland, made the first and second extension and also the refurbishment of the Tanks. To refurbish an old building and make it useable for different function demonstrates sustainability.

www.tate.org.uk

Photographer:
Thomas Buikema

Hans Peter Schaefer
2001, Wikipedia
Commons

BUILDING A SUSTAINABLE LONDON

EXPLORE

Chobham Academy

Architects: Allford Hall Monaghan Morris (AHMM)

40 Cheering Lane, Newham, E20 1BD

CHOBHAM ACADEMY
Photographer: Tim Soar

The Academy is a building that supports both wellbeing of the community and biodiversity. The heating design is very energy efficient. The main heating and cooling system comes from pipes six meters below ground (means inside the earth) the air that enters into the building is always a bit colder or hotter than the outside, this design decision saves lots of energy. A combination of meadow flower-seeded turf, planters and a 'brown' roof, plus playful and colourful areas provide lovely area for the local community to explore.

www.chobhamacademy.org.uk

Six Bevis Marks

Architects: Fletcher Priest
Bury Court EC3

This building has an interesting roof, which acts as a thermal buffer. It also provides a covered garden to relax in, even when it's raining outside. The building even harvests the rain water for toilet flushing! The Architects made sure to optimise thermal insulation values, to reduce heating demands in winter.

www.6bevismarks.com

Ely Court

Architect: Alison Brooks
Ely Place EC1N 6RY

Located in the London Borough of Brent, this building has been designed to provide exceptionally high quality, bright and spacious social housing. This project is an example of social and economic sustainability. Floor to ceiling height is generous at 2.6m and all windows are full height French doors, which provides an enormous sense of light and space. The three buildings share a common brick, with particular features such as porches, porticoes and balconies, articulated in metal.

www.alisonbrooksarchitects.com/project/ely-court/

BUILDING A SUSTAINABLE LONDON

EXPLORE

BEDZed

Beddington Zero Energy Development
Architect: Bill Dunster

21 SandmartinWay, Wallington SM6 7DF

BEDZED
Tom Chance 2009, Flickr

This is an example of a low carbon residential scheme. The project was designed to use only renewable energy, which is generated on site. There are 777 square metres of solar panels. To organise a visit, please contact the visitor centre for a guided tour.

www.zedfactory.com/bedzed

RSPB's Environment and Education Centre

Architect: Van Heyningen and Haward Architects LIP

New Tank Hill Road, Purfleet, Rainham, South Ockendon RM19 1SZ

RSPB ENVIRONMENT AND EDUCATION CENTRE
vHH 2012, Wikipedia Commons

Located in Rainham Marshes in East London, this building uses sheep wool for insulation and nearly all materials were locally sourced. The Architects designed two big translucent roof cones that allow plenty of daylight in. They also glow in the dark!

goo.gl/1RlkFb

Trinity Buoy Wharf

Architect: Nicholas Lacey and Partner

64 Orchard Pl, Poplar E14 0JW

CONTAINER CITY 2 AT TRINITY BUOY WHARF
Cmglee 2012, Wikipedia Commons

This building is made out of recycled shipping containers and is used as studios and/or flats for artists. It is very vibrant and colourful. This is a very good example of reusing and recycling materials that are no longer needed.

www.trinitybuoywharf.com

BUILDING A SUSTAINABLE LONDON

CONNECT

Creating your own sustainable building

Duration: 90 mins

Setting the scene

Having learned about the key components of sustainable buildings and having visited real examples of London sustainable architecture, in this session, children will be asked to create their own example of a sustainable building for London.

Encourage children to reflect on the buildings that they saw as part of their Explore visit. What was it about the building that made it sustainable? Can you name something that used renewable energy? Were there any examples of recycling?

Activity 1

Share the information on Fact sheet 3: Examples of sustainable building (page 88) with students. Explain that this Fact sheet contains examples of planning, undertaken by Architects, that give some exciting ideas for sustainable building. Most of these ideas were stopped at the planning stage, so didn't go on to become buildings, but they give you a good idea of the types of buildings Architects planned as 'buildings of the future.'

Activity 2

Give children blank pieces of A3 paper. You might like to have children work in small groups for this activity, or have them work independently.

First ask each group/individual to have a discussion about what elements their sustainable building will have. You might like to put some ideas to scaffold them on the interactive whiteboard. Will you include recycling? What kind of energy will your building use? Will there be any plants/greenery in your building? What will your building be made out of?

Then ask children to draw their building on the A3 paper and try to demonstrate as many sustainable building techniques as possible. They should use a clean energy source, include and respect urban fauna and flora in their design, think about the transportation system and connections with other buildings, optimise the use of land such as designing new rooftops.

BUILDING A SUSTAINABLE LONDON

CONNECT

Activity 3

Encourage children to be creative and daring, invite them to use colours and make a new building with new shapes. Some examples of previous sustainable building designs from children are shared opposite for inspiration.

After drawing/annotating individually for 45 min, children should cut out their designs and all together decide how to glue and group the buildings to shape a big class collage to be named 'Future London.'

LITTLE ARCHITECT COLLAGE. OLIVER GOLDSMITH SCHOOL, YEAR 5.
Photo: Dolores Victoria Ruiz-Garrido

FACT SHEET 1: LEARNING ABOUT SUSTAINABILITY

United Nations Global Goal number 11:

"Make cities and human settlements inclusive, safe, resilient and sustainable."

www.globalgoals.org/global-goals/sustainable-cities-and-communities/

Having the opportunity to design a new building is probably the most exciting experience for an Architect. As we explored in the last topic, Architects spend a lot of time researching the site, drawing, and testing ideas with physical models or virtual reality.

Buildings are not **isolated** (on their own), they form part of a city and cities work to serve the people that live there. The way we design our buildings and cities always affects the environment, and so can also affect the health of the people that live there.

In this fact sheet you will learn about a **global plan** (a plan for the whole planet) to tackle environmental and social problems, which has a huge impact on the way that we build in London.

Global Goals for Sustainable Development

In September 2015, World Leaders met at the United Nations and committed to what they called The Global Goals for Sustainable Development. They developed 17 goals to achieve three extraordinary things in the next 15 years:

1. End extreme poverty.
2. Fight inequality and injustice.
3. Protect the environment.

They want us citizens, including children of all ages, to encourage others to look after the environment and become the generation that changed the world.

FACT SHEET 2: KEY CONCEPTS IN SUSTAINABLE BUILDING

In order to design a new sustainable building Architects spend a lot of time researching the local area in which the building will be positioned. Some key concepts (with definitions) below show you just how many things Architects need to think about when designing a sustainable building.

Sustainability

The idea that buildings should be produced in ways that do not damage the environment.

Resilience

The building needs to be able to recover quickly from problems, for example, pipes leaking or a natural disaster.

Population

London currently has 8.6 million inhabitants. Recent estimates indicate that by 2050 there will be 11 million people living in London. Buildings in London are also visited by large numbers of tourists each year.

Pollution

This is caused by harmful substances or waste, and often affects water, air and/or soil. Nearly 4 million people work in parts of London which are above legal limits for nitrogen dioxide pollution.

Renewable energy

Energy that is produced using the sun, wind, waves, or from crops, rather than using fuels such as oil, gas or coal. Sustainable buildings should be using renewable energy sources.

Transport

London has a very good public transport system, but the roads are often very busy and it can take a long time to travel to and from your destination. How would people get to and from a sustainable building?

Accessibility

Everyone should be able to get in and out of London's buildings, and should be able to enjoy all of the exciting things contained in a building.

Ecological footprint

The amount of the Earth's energy that someone or something uses. A sustainable building should use the minimum amount of energy possible, so have a low ecological footprint.

Recycling

This is the process of converting waste into reusable material. Sustainable buildings should encourage collecting of old paper, glass, plastic, and even metal so that it can be recycled and used again.

FACT SHEET 3: EXAMPLES OF SUSTAINABLE BUILDING

Toyo Ito

Dragon Stadium, Taiwan

The Sun is the cleanest and cheapest source of energy. Engineers have developed the technology to transform the solar radiation, captured from the Sun, into electricity through solar panels. This means that many of our buildings can use clean energy provided by the sun for free. You can find lots of examples of architecture using solar energy in the competition Solar Decathlon but Fen's favourite building, because of its solar panels, is the **Dragon Stadium** in Taiwan, from the Architect Toyo Ito.

DRAGON STADIUM, TAIWAN
Peellden 2017 Wikipedia Commons

FACT SHEET 3: EXAMPLES OF SUSTAINABLE BUILDING

Harvey Wiley Corbett

City of the Future. 1913.

A City of the future design, with traffic and pedestrians separated. Discussing this very old project is a good way to stimulate a debate on land use. Are we addressing the problem of cars and pollution if we separate people from traffic? Fen loves to walk at night on his own but he also likes to observe people – he wouldn't like a road just for foxes!

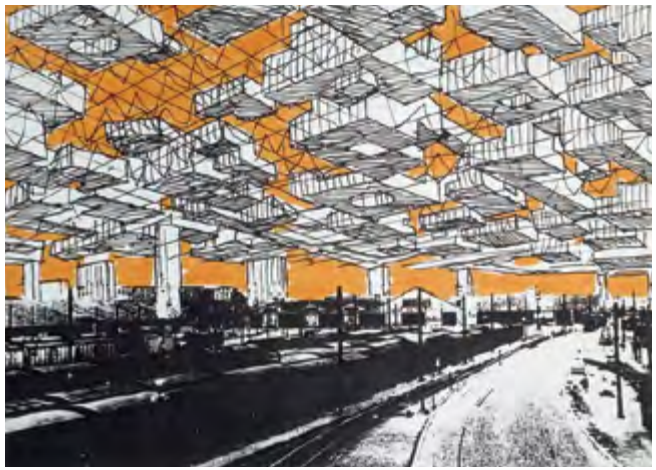
Are bikes and more pedestrian routes a good option for a sustainable London? Is London a pedestrian or car friendly city? Take a look at this project that the Architect Norman Foster has designed for London. Do you like his idea? It is an elevated road just for bikes.
www.dezeen.com/2014/01/02/foster-promotes-cycling-utopia-above-londons-railways/

CITY OF THE FUTURE, HARVEY WILEY CORBETT, 1913

FACT SHEET 3: EXAMPLES OF SUSTAINABLE BUILDING

Yona Friedman.

The Mobile Architecture, The Spatial city.



SPATIAL CITY, 1958/ 1959
Reproduced with kind permission Yon Friedman

Yona Friedman was born in 1923 in Budapest (Hungary) and lives and works in Paris (France). Yona Friedman was trained as an Architect and gained fame with his manifesto *The Mobile Architecture* and his idea for a different approach to urban growth with *The Spatial city* from 1956. Should we use the sky? Should we create bridges to join buildings together?

www.yonafriedman.nl/?page_id=78

MRDV

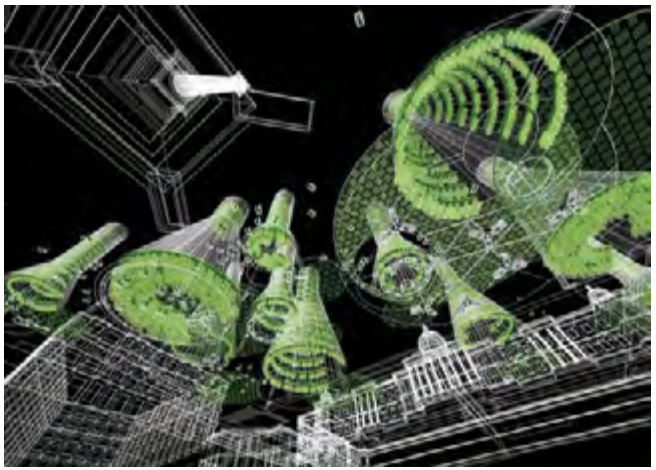
Pig city, Vertical farms.

This is an utopian project that is addressing the problem of not having enough food in an overpopulated world. If cities are more and more populated we need to think about the way we produce food, so these Architects are proposing a city for pigs: Farm Skyscrapers!

www.mvrdv.nl/projects/181-pig-city

CJ Lim

Smart Cities + Eco warriors.



CJ Lim's project explores sustainable city design. *Smartcities + Eco-Warriors* address what happens when sustainable design is applied to a city. The main component of the smartcity is urban agriculture (lots of plants and vegetation in the city) and the establishment of an ecological balance between nature and buildings.

www.flickr.com/photos/uclnews/sets/72157625198573526/

CREDITS

The GLA would like to thank the following organisations for their contribution:

Our collaborators on the London Curriculum

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Imagery


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