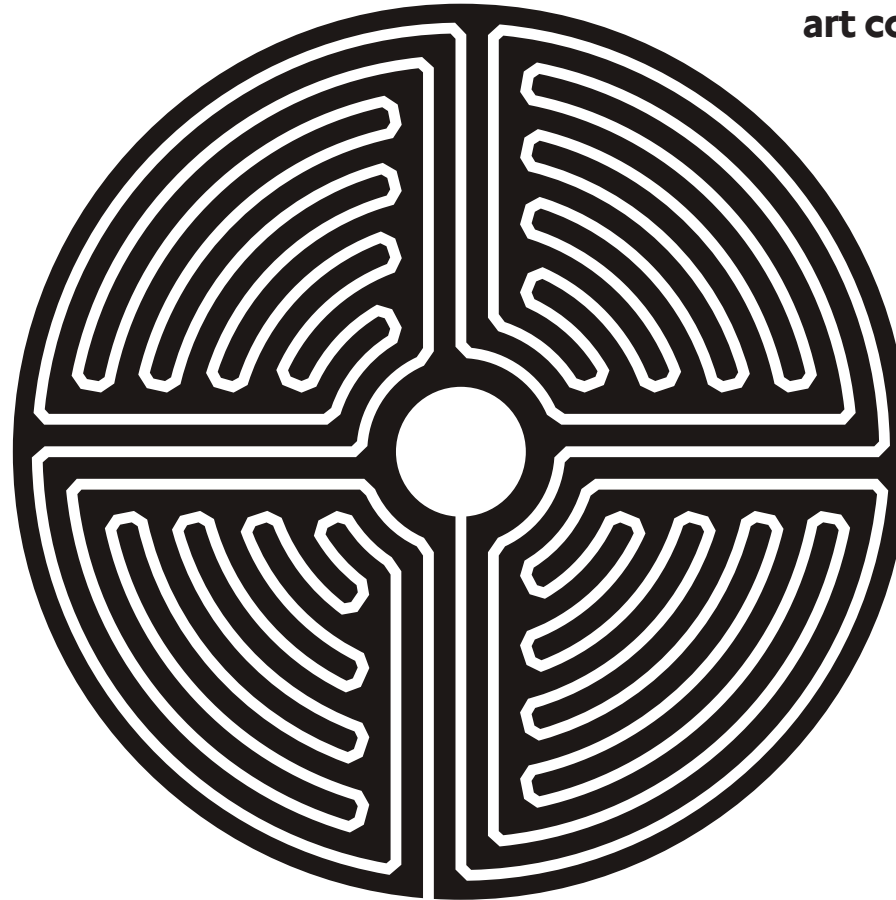


ART ON THE UNDERGROUND



***Underground, Overground;
The Russell Square Walk:***
a family activity inspired by
Labyrinth, a major contemporary
art commission by Mark Wallinger



Supported using public funding by
**ARTS COUNCIL
ENGLAND**

JCDecaux



MAYOR OF LONDON

Transport for London



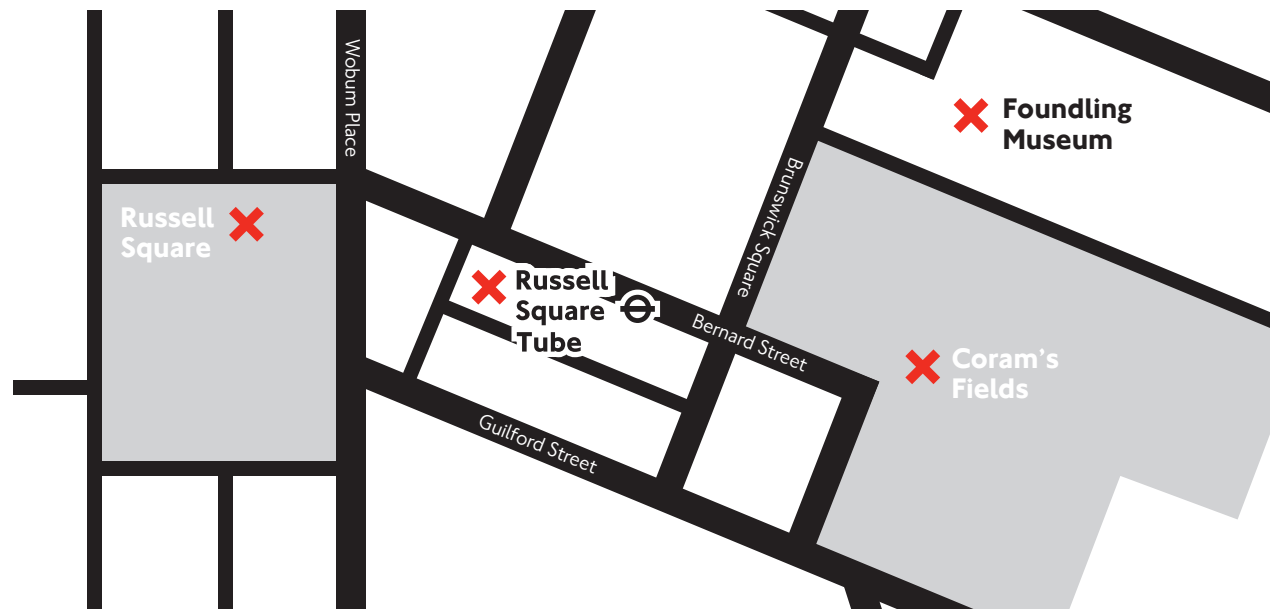
Foreword

This mathematics-based family walk is located in and around the area close to Russell Square Tube station and invites you to visit a number of places of interest, all within a 10-minute walk of the station.

The walk, devised by Bath University is inspired by *Labyrinth*, a series of permanent artworks on the Tube by Mark Wallinger, commissioned by Art on the Underground to mark the 150th anniversary of London Underground. A total of 270 unique circular labyrinths have been installed across the network. At each station, the location of the labyrinth differs, whether in the ticket hall, in a walkway or on the platform. The circular route reminds us of the individual journeys that millions of people take on the Underground each day. Where will the path lead us? The spread of labyrinths across London is like a trail in itself, encouraging us to seek them out. As Wallinger

says, "In a sense, the search for the labyrinth within the station is another puzzle."

One of these individual artworks at Russell Square Tube station is waiting to be found by you! This is where your journey begins. As well as finding out more about *Labyrinth*, this trail aims to introduce you to a fascinating area of London that has evolved around the welfare of children. Destinations include Russell Square, the Foundling Museum and Coram's Fields. The estimated time to answer the questions at each location is 20 minutes. You may want to pick a selection of places to visit, depending on the time available.



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The Start, Location 1: Russell Square Tube station

7–11 Bernard Street, London WC1N 1HX
www.tfl.gov.uk (Search: Russell Square)



About the station

Russell Square Tube station was opened on 15 December 1906 and is a Grade II listed building. It takes its name from the Dukes of Bedford, landowners of the site and surrounding area, whose family name was Russell. The station is home to one of Mark Wallinger's 270 labyrinth artworks.

1) Stand at the station entrance

Look at the letters of the original station name sign, which form an intrinsic part of the building. Notice how the style of this lettering differs from that on the modern signage. Looking at the newer station name, RUSSELL SQUARE STATION, which of the letters has reflective symmetry? Write the letters below:

1. _____
2. _____
3. _____
4. _____
5. _____

The lettering that is used on the Underground and also in this trail is known as New Johnston.¹ Features of the font include the perfect circle of the letter O and the use of a diagonal square dot above letters i and j and for the full stop.

Russell Square station

2) Explore the station and find its labyrinth

Look at the bottom right-hand corner of the artwork. You will see a unique reference number. Note the Russell Square labyrinth number here:

This number refers to the order in which this station was visited during the 2009 Guinness World Record Tube Challenge.² The Tube Challenge is a race to pass through all 270 stations on the network in the shortest time possible. Rules state that participants don't have to travel along all Tube lines, but must pass through all stations on the system. They may connect between stations on foot or by using other forms of public transport.

¹ New Johnston is a typeface designed by and named after Edward Johnston. Commissioned in 1913 by Frank Pick, Commercial Manager of the Underground Electric Railways Company of London, the new font was a part of his plan to strengthen the company's corporate identity, which led to the Underground brand.

² The Guinness World Record Tube Challenge was completed by Andi James, Martin Hazel and Steve Wilson on 14 December 2009 in 16 hours, 44 minutes and 16 seconds. A new world record time of 16 hours, 20 minutes and 27 seconds was set in August 2013 by Geoff Marshall and Andy Smith.

Visit <http://art.tfl.gov.uk/labyrinth/> to see the Tube Challenge 2009 route animated on the Tube map.

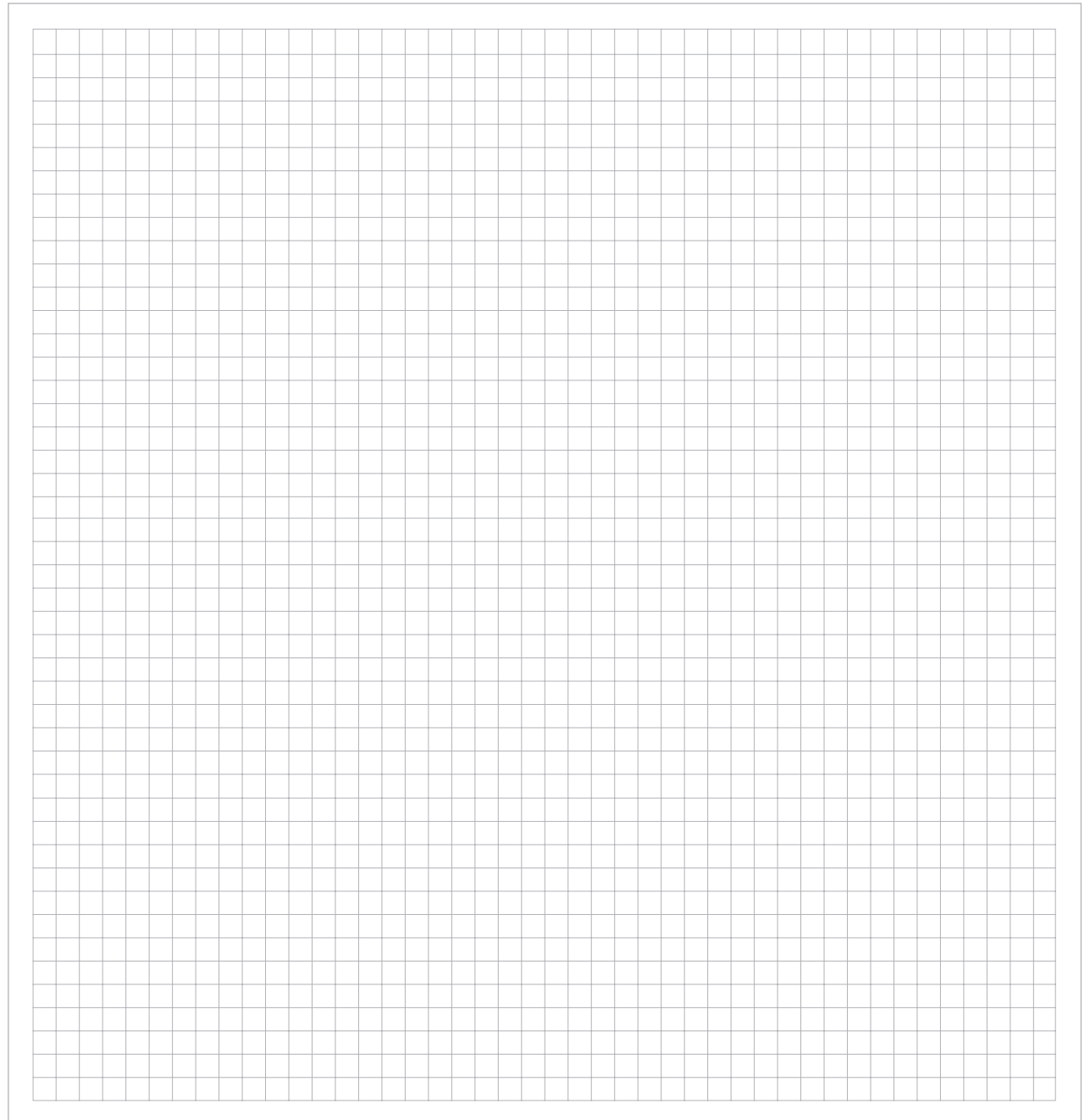
3) Trace the labyrinth's path

The red cross marks the spot "You are here". Starting from the cross, trace the path to the centre and back out again using your finger. You'll notice that there's only one way in and out again. This single path, with no choices or dead-ends, is what makes it a labyrinth and not a maze. You can't get lost in a labyrinth. You simply have to trust the path that leads you to the centre. Each of Wallinger's labyrinths has a unique path.

See p.20 to have a go at creating your own labyrinth.

Use the squared paper to draw a plan of the labyrinth's location. Consider prominent features around it and in relation to its placement, and pace these out to calculate approximate distances between the labyrinth and other objects. Use the squares to aid you in keeping the plan to scale.

Mark Wallinger, *Labyrinth*, 2013
(Russell Square 229/270)



4) Map it out

Find a Tube map,³ either on a wall or in a fold-out pocket Tube map.

If you wanted to go from Russell Square to London Bridge Tube station with as few changes as possible, what route would you take? (Hint: you should be able to make the journey with just 1 change!)

If the Northern line wasn't running, how would you alter your route?

Choose any three stations with interesting names. Write these three station names down:

1. _____

2. _____

3. _____

Work out a route between all three stations, using the least number of lines possible:

³ The Tube map we use today comes from Harry Beck's 1931 design. Beck was a London Underground employee who realised that because the railway ran mostly underground, the physical locations of the stations were irrelevant to the traveller wanting to know how to get to one station from another. He simplified the network based on the interactions of the lines themselves rather than their actual location relative to one another. This form of map is called 'topographical'.

Location 2: Russell Square

London, WC1B 5EH
<http://www.camden.gov.uk>
(Search: Great parks in Camden, Russell Square)

About the Square

Russell Square is the second-largest square in London. Completed in 1806, it was named after the Dukes of Bedford who developed the family's London landholdings on and around this site. Following the demolition of Bedford House, Francis Russell, the fifth Duke of Bedford commissioned James Burton (1761–1837) to develop the land to the North into a residential area. Russell Square was designed as the focal point of the development and Humphrey Repton, England's foremost landscape designer at the time, was invited to lay out the gardens. Although the Square has undergone various changes since its original conception, and suffered considerable damage during World War II, many historic features remain. In 2002 it was re-landscaped in a style based on Repton's plans with support from the Heritage Lottery Fund.

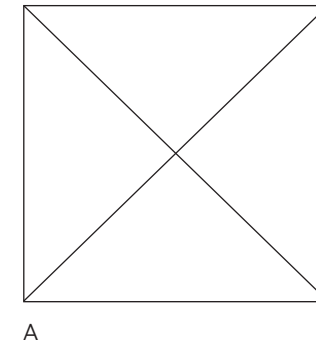
Russell Square



1) Find a map of the Square

Using the scale shown on the map, estimate the area of the Square.

The plan of the Square when simplified looks like a cross.



Can you find a path from A to B that uses each path only once? Use the diagram above to help you. On the route you've found, how many times would you pass the fountain in the centre of the park?



Detail from Richard Welmscott's statue of Francis Russell, erected 1807

2) Find the statue in the Square

This is a statue of Francis Russell, the fifth Duke of Bedford, who was responsible for much of the development of central Bloomsbury, including the Square itself. It depicts Russell with one hand on a plough, the other holding ears of corn, and a sheep at his feet. He was passionate about agriculture, setting up a model farm in Woburn and conducting experiments about sheep breeding. The statue is located so that the Duke can look out over the area of land he developed to the North of the Square. Look at the plinth below the Duke. When was the statue erected? Write the Roman numerals here:

How would you write this date today?

Can you write the year of your birth in Roman numerals?

Use the map to find the SE corner of the Square. This is where the Headquarters of the London Mathematical Society is. If you walk past the building, find out what the letters 'DMH' stand for.

3) Find the fountain in the Square

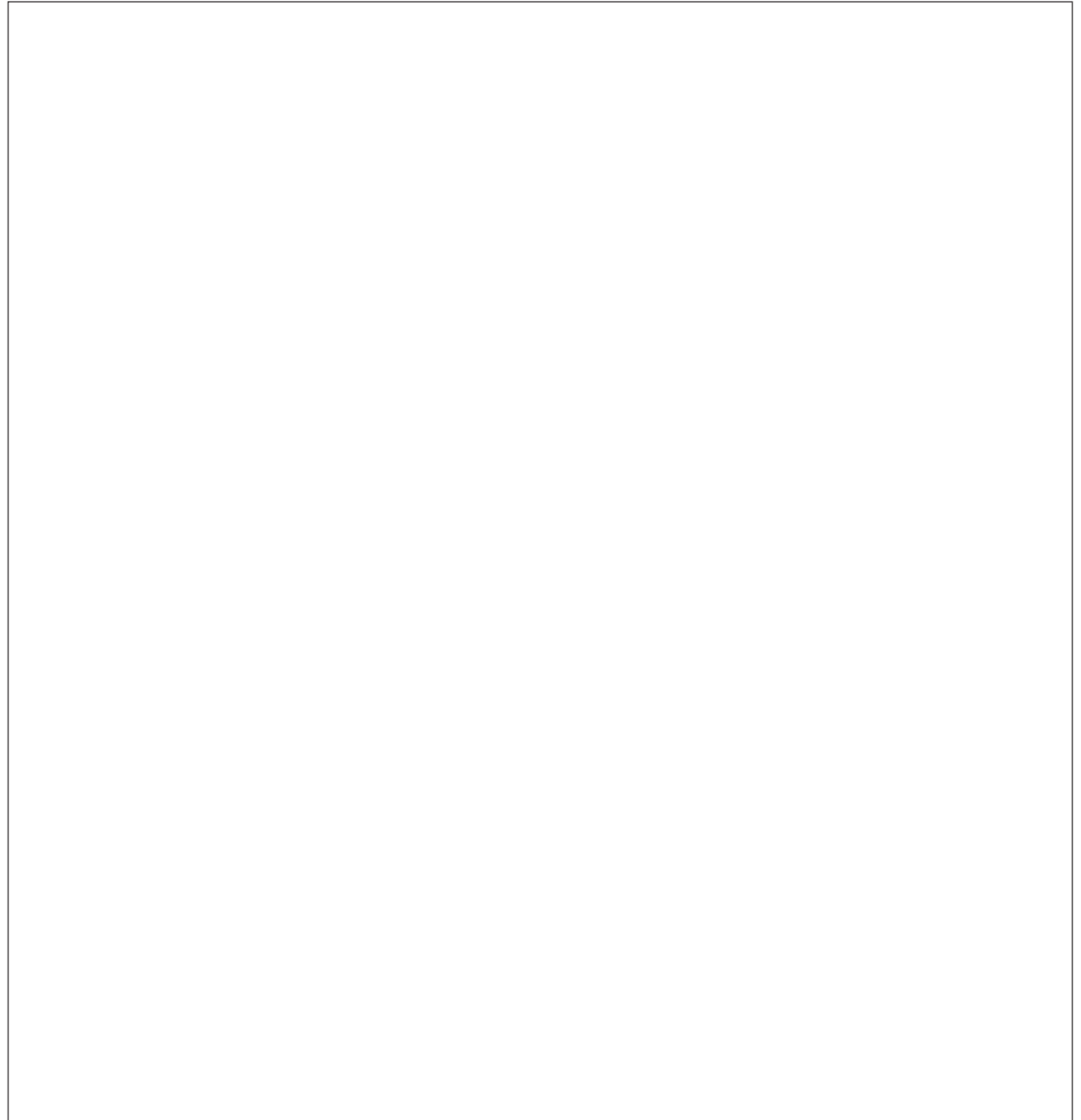
Count the number of water jets:

Currently, there are five circular jets going across the diameter of the fountain. Maintaining the current pattern, how many jets would you need to add to the diameter to enlarge the fountain?

How many jets would this bigger fountain be made of in total?

Look at the pattern of the fountain's design. How many axes of rotational symmetry are there?

Draw a plan of the enlarged fountain in the box:



4) Find the pergola

(covered walkway formed by trees)

The re-planting of the Square in 2002 included the creation of this pergola and path layout to echo Repton's designs. A pergola is a garden feature forming a shaded walkway or sitting area. Find out more about this pergola by counting its component parts. How many of the following are there?

Pergola, Russell Square



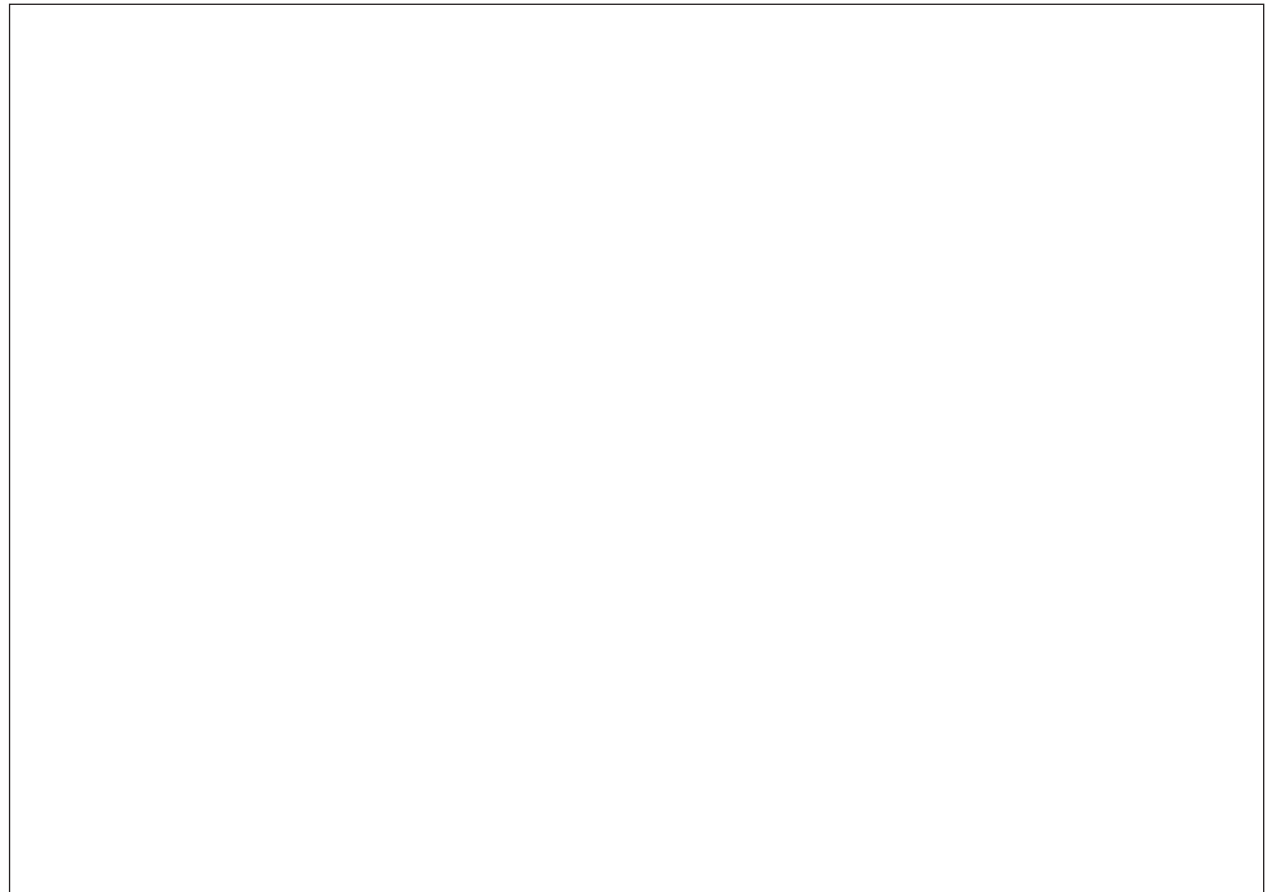
Trees:

Vertical poles:

Wires across the 'ceiling':

Cross rails:

Starting from one end of the covered path and ending at the other, run or walk around the Square, covering as many pathways as you can. Draw a simple diagram of your route here:



Location 3: Foundling Museum

40 Brunswick Square, London WC1N 1AZ
www.foundlingmuseum.org.uk

Please note that there is an admission cost for adults. Free admission for children up to 16 years, Foundling Friends and Art Fund members. For more information on special offers, group rates and family days please visit the Museum website.

About the Museum

The Foundling Museum tells the story of the Foundling Hospital, Britain's first children's charity and London's first public art gallery. From the 1740s, the Hospital cared for "exposed and deserted young children" and continues today as the children's charity Coram. The Museum explores the work of the Hospital's founder, Thomas Coram, as well as famous supporters like the artist William Hogarth and the composer George Frideric Handel. The Collection spans four centuries and contains paintings, sculpture, prints, manuscripts, furniture, clocks, photographs and ephemera relating to the foundlings' lives. The Museum building was constructed in 1935–7 and incorporates many original architectural features from the eighteenth-century Hospital building.

The Foundling Museum



1) Enter the Museum and go into the Introductory Gallery

Find the population figures from 1700–2001.
How many more people were living in London in 1850 compared with 1800?

Calculate the percentage increase in population between 1700 and 2001 in the box below:

2) Find the lottery display

When the Foundling Hospital began, admission was open to babies under two months old who were not carrying an infectious disease. Places were limited, so desperate mothers would try to push to the front on admissions day to secure a place for their children. To make the system more ordered, a ballot was introduced. Hopeful mothers attended 'Reception Days', when they were invited to draw a ball from a bag to determine their child's fate.

This display explores this process and shows the likelihood of a child getting a place at the Foundling Hospital. The colour of each ball represents the answer a mother would receive about her child's application to live there, white being a 'yes', black being a 'no' and red being a 'maybe'.

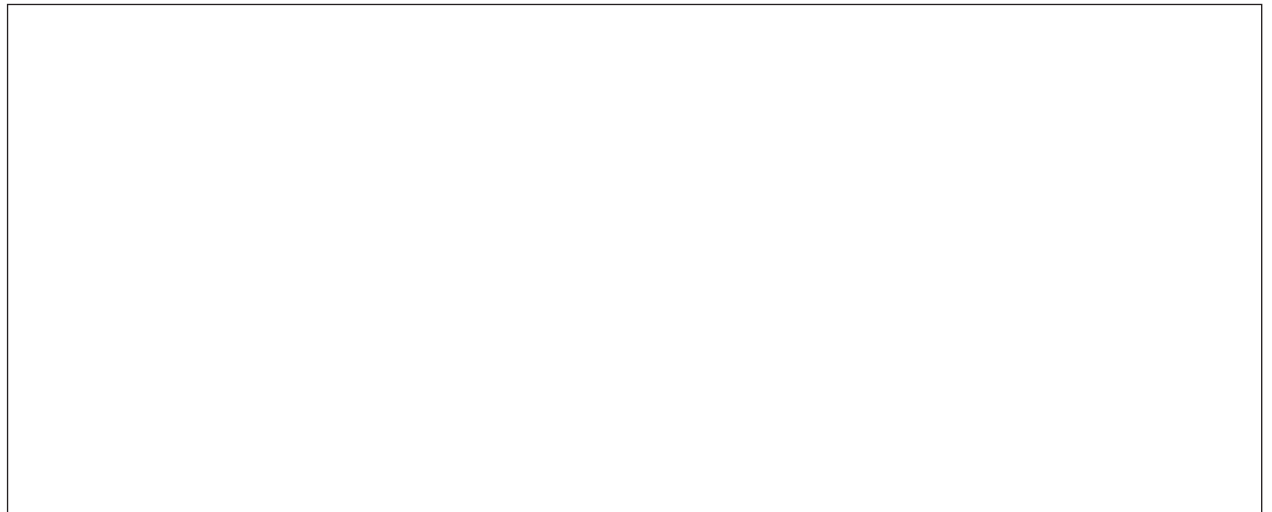
Pick a ball on behalf of an imaginary child. Which colour ball did you pick?

What would this mean for the child applying for a place?

If there are 17 white balls, 4 red balls and 35 black balls. What are the chances of 1 child getting a place?

Typically, there would be about 60 children wanting a place, but only 20 places available. If you were to play a lottery game, picking balls blindly from a bag without replenishment, what is the probability of picking out a white ball if the bag contains 20 white balls and 40 black?

If you are the fifth person to pick out a ball, and everyone before you has picked out a black ball, does this change your chances?





Nathaniel Parr (1723–1760) after Samuel Wale (1721–1786), *An Exact Representation of the Form and Manner In Which Exposed and Deserted Young Children Are Admitted Into the Foundling Hospital*, 1749, engraving, black ink on paper

3) Go upstairs to the first floor

As you walk up from the ground floor, look at the staircase. This is the original staircase from the old school. It used to have spikes along the handrails to stop the boys sliding down it. Can you imagine them doing this? Don't try it yourself!

Find the "Picture Gallery" on the first floor. Can you spot the portrait of Thomas Coram? It was painted by artist William Hogarth, one of the Foundling Hospital's benefactors. This is Hogarth's only known full-length portrait and shows Coram dressed in fine clothes, surrounded by significant objects.

List three objects arranged around him:

1. _____
2. _____
3. _____

What do you think these objects tell us about him?

Coram (1668–1751) was the founder of the Hospital and campaigned for 17 years before his dream of creating a Foundling Hospital in London was realised.

Use the dates of birth and death given. To what age did Coram live?



Tracey Emin, *Baby Things [Mitten]*, 2008

4) Find the foundling tokens

Walk through one of the doorways on either side of Coram's portrait. Find the foundling tokens in two display cases.

Some of the most poignant items in the Collection are the foundling tokens. These were pinned by mothers to their babies' clothes and upon entry, the Hospital would attach them to the child's record of admission. Since foundling babies were given new names, these tokens helped ensure correct identification, should a parent ever return to claim the child. The children never saw their tokens, which were frequently everyday objects, including scraps of paper, fabric, playing cards, pieces of jewellery and ribbons.

Look at the objects in the case labelled "Tokens left with Children 1741 to 1760".

Many of the tokens are coins, some of which are personalised. The coin tokens come from over 20 different countries and states, giving an idea of the cosmopolitan nature of London society and the extent of its trading networks.

Look at the variety of shape of coin displayed. Count how many of each shape you can see:

Heart:

Oval:

Circle:

Semi-circle:

Triangle:

Kite:

Estimate the number of tokens on display. How many children are represented by these tokens, given that each child was left with one item on entry? (Don't forget to account for the coins that have broken in half!)

Based on the answer above and the fact that only 1/3 of all children presented to the Hospital in the 18th century were admitted, how many children were refused entry?

For more information on the foundling tokens see: Janette Bright and Gillian Clark, *An Introduction to the Tokens at the Foundling Museum*, the Foundling Museum, London, 2011.

On the way out, take a look at a contemporary response to the foundling tokens. *Baby Things, [Mitten]* is a tiny bronze cast by artist Tracey Emin. The artwork was a gift from the artist and a private donor and is permanently displayed outside the Museum on the railing behind Thomas Coram's statue.

Location 4: Coram's Fields

93 Guildford Street, London WC1N 1DN
www.coramsfields.org

Please note that Coram's Fields is not a public park and adults may only enter if accompanied by a child.

About the playground

Coram's Fields is a unique seven-acre playground and park for children and young people up to the age of 16 living in or visiting London. It includes a Youth Centre, Children's Centre, Out of Hours School Club, Community Nursery, Sports Programme, a city farm and a cafe that is open from March until October. It is located on the original site of the Foundling Hospital, established by Thomas Coram in 1739. The entrance gate and the two long white porticoes are all that's left of the original building. The covered porticoes were where the founding children exercised in bad weather.

1) Find the clock

Look at the weathervane above the clock. In which direction are the animal enclosures from this point?

Walk directly East from the clock to find the Foundling Hospital's coat-of-arms.





Foundling Hospital's coat-of-arms, designed by William Hogarth, c. 1747

⁴William Hogarth (1697–1764) devoted over 25 years of his life to the Foundling Hospital. He designed the uniforms and the coat-of-arms, fostered children, donated the first art work to the Hospital – his portrait of Thomas Coram – and encouraged his contemporaries to do the same. This led to the creation of the Foundling Hospital Collection and England's first public art gallery.

2) Look at the Foundling Hospital's coat-of-arms

Look closely at the design by William Hogarth, c.1747. ⁴It shows a child flanked by Britannia on the right and Nature (or a mother goddess) on the left. The lamb, used as a symbol of the Foundling Hospital, holds a sprig of thyme in its mouth.

Read the word (or motto) underneath the shield.
Write the four-letter word here:

A motto is a word or phrase that summarises a person, family or group represented in a coat-of-arms. Why do you think this word was chosen as a motto for Coram?

Using the same four-letter word, let the alphabet letters A to Z correspond to the numbers 1 to 26. i.e. A = 1, through to Z = 26

What numbers do the four letters represent?

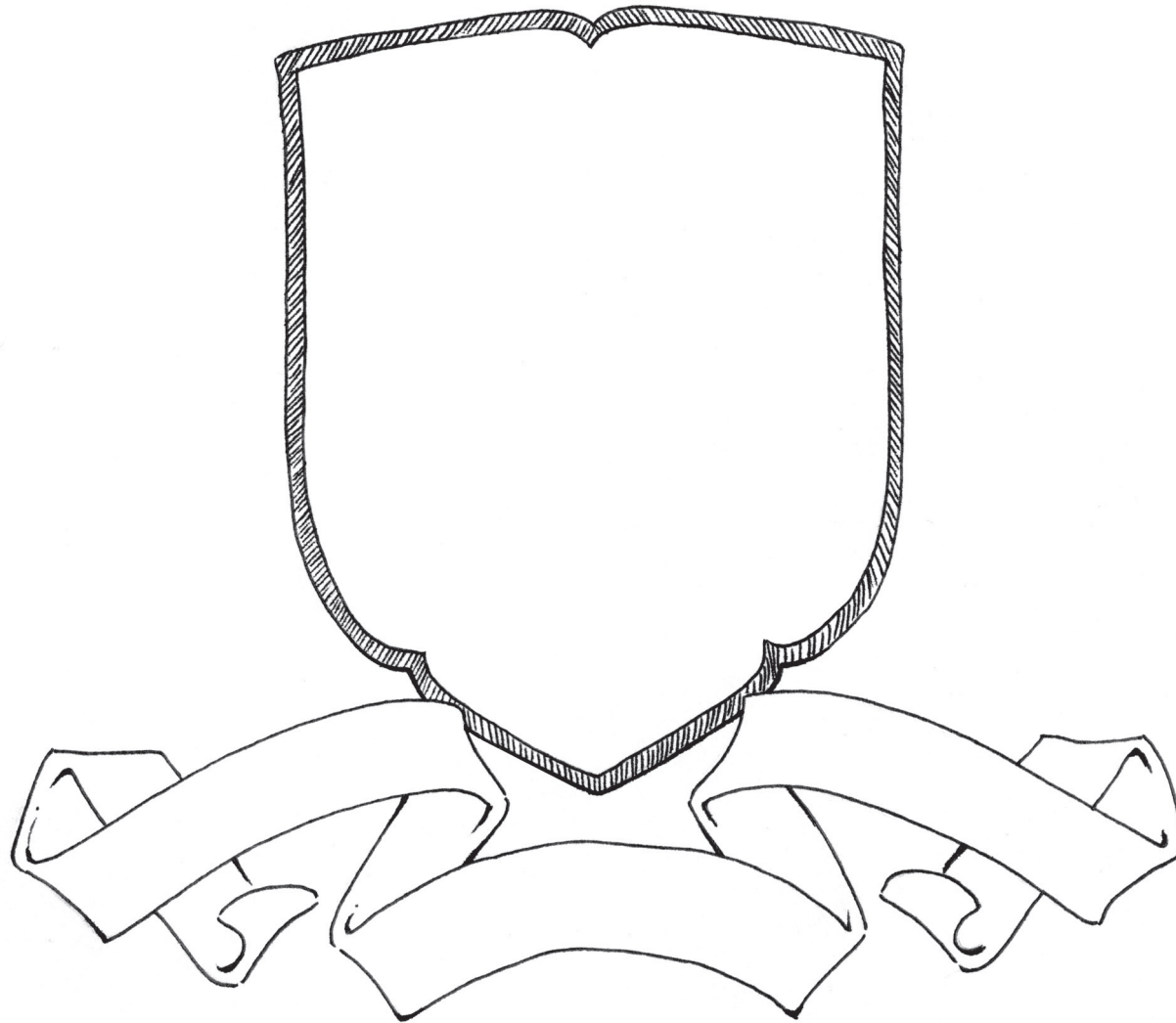
Which number is prime?

Which is the highest number that the three remaining numbers (not prime) are divisible by?

Write a message in number code below for a friend to translate back into letters:

3) Design your own coat-of-arms

Use the blank shield and motto to make a coat-of-arms all about you. What pictures (or symbols) will you add to the shield? What word or sentence would you choose to be your motto?





Original porticoe,
Foundling Hospital

3) Find the wooden train

How many wheels does the train have?

If the radius of a big train wheel is 15 cm and π is approximately 3, then how many times would the wheel have to fully rotate in order for the train to travel 45 m? Use the box below for your calculations:

4) Find the zipwire

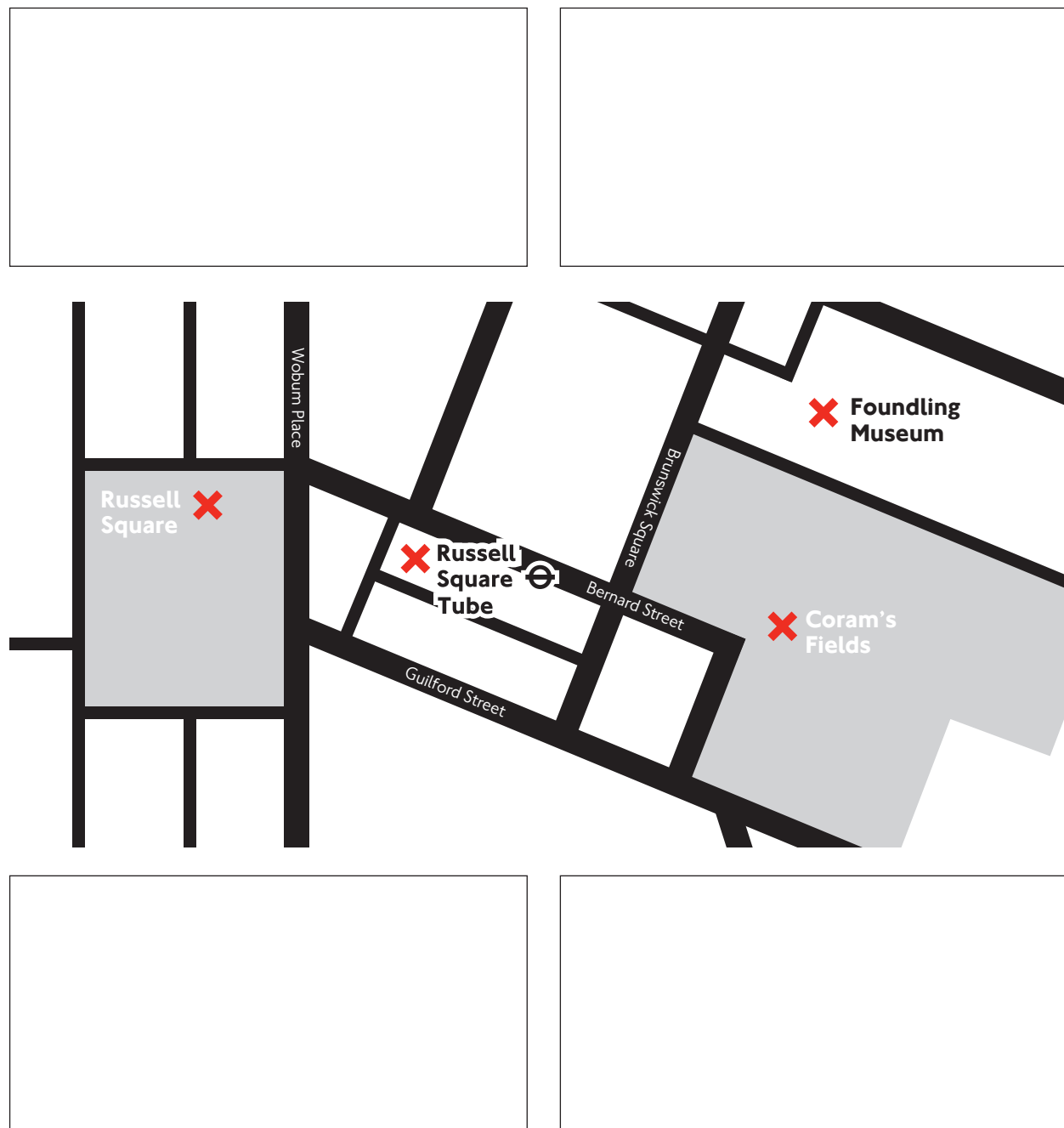
If the length of the zipwire is 20m and it took you 5 seconds to travel from one end to the other, what was your average speed? Use the box below for your calculations:

Time how long it actually takes you to travel along the zipwire. By how much does this time differ from the estimate of 5 seconds?

The End

We hope that you've enjoyed the journey that The Russell Square Walk has led you on.

When you've completed your walk, mark the route you took on the map below. Use the rectangles around the map to write or draw the things that you found interesting along the way. Draw a line between each rectangle and the map to mark its location.



How to draw a labyrinth

To draw a seven-circuit classical labyrinth, just follow these steps.



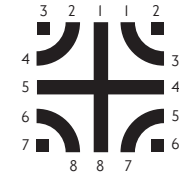
Draw a cross



Add a curve in each corner



Add a dot in each corner



Each point will be connected with the corresponding number



1. Use this figure as your starting point



2. Connect top with righthand curve (1 to 1)



3. Connect lefthand curve with righthand dot (2 to 2)



4. Connect righthand curve with top lefthand dot (3 to 3)



5. Connect righthand bar of cross with lefthand curve (4 to 4)



6. Connect righthand curve with left hand bar of cross (5 to 5)



7. Connect lefthand curve with bottom righthand dot (6 to 6)



8. Connect righthand curve with bottom lefthand dot (7 to 7)



9. Connect lefthand curve with bottom lower arm of the cross (8 to 8)

About

Art on the Underground
<http://art.tfl.gov.uk>

Our vision is to present 'World Class Art for a World Class Tube'. We provide a programme of contemporary art that enriches the Tube environment and customers' journey experiences, as well as continuing London Underground's long-standing tradition of art and design at the core of its identity and services. Visit our website for more information about *Labyrinth* and other exhibitions and projects on the Underground.

The accompanying *Labyrinth* Teacher Packs are available to download here:
<http://art.tfl.gov.uk/labyrinth/learning>

Foundling Museum

www.foundlingmuseum.org.uk

The Foundling Museum explores the history of the Foundling Hospital, the UK's first children's charity and London's first public art gallery. Through a dynamic programme of exhibitions and events, the Museum celebrates the ways in which artists and children have inspired each other for over 270 years.

Opening Hours

Mondays: Closed
Tuesday–Saturday: 10:00–17:00
Sunday: 11:00–17:00

Admission

Admission charge includes entrance to all temporary exhibitions and displays.
Adult: £7.50 (£8.25 including Gift Aid)
Concession: £5 (£5.50 including Gift Aid)
Free admission for children up to 16 years,
Foundling Friends and Art Fund members
Half price admission for National Trust members

Coram's Fields

www.coramsfields.org

Coram's Fields is a unique seven-acre playground and park for children and young people up to the age of 16 living in or visiting London. It includes a Youth Centre, Children's Centre, Out of Hours School Club, Community Nursery, Sports Programme, a city farm and a cafe that is open from March until October.

Bath University Mathematics Department

<http://www.bath.ac.uk/math-sci>

The Department of Mathematical Sciences at the University of Bath is one of the leading mathematics departments in the UK. Mathematics activities included in the Walk were devised by final year students as part of a module on 'Communicating Mathematics'.

Other Mathematics-based Walks can be found at the website of the Institute of Mathematics and its Applications: www.ima.org.uk or on the Maths In the City website: www.mathsinthecity.com

Credits

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Edited by Anna Linch
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Designed by Rose

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