

# A Maths Trail for the Science Museum and South Kensington



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The Maths Zone

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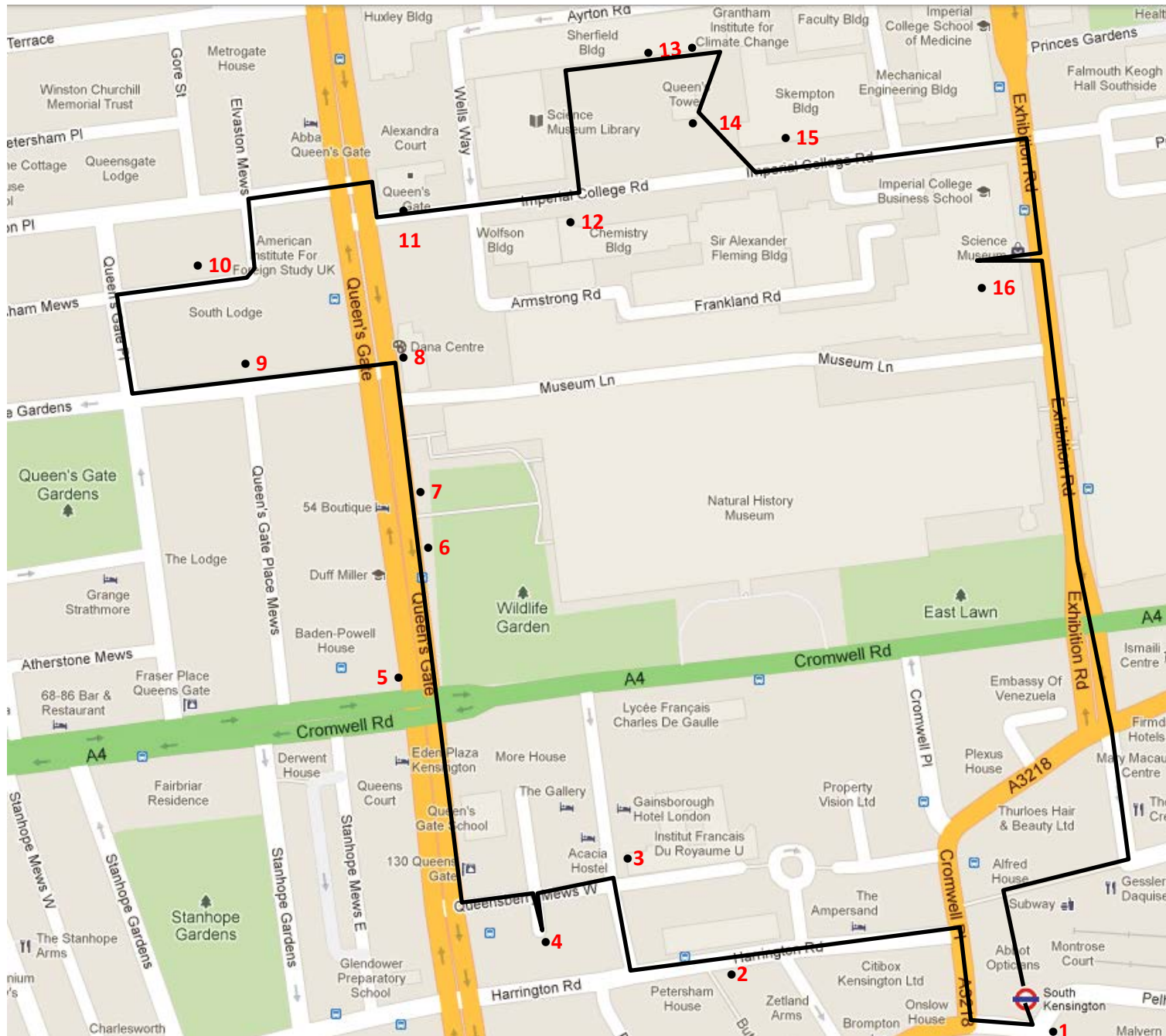


# The Trail Map

Start in the Piazza to the South side of South Kensington tube station.

Excluding time in the museum, the trail should take about 45 to 60 minutes.

Use this map as your main guide. The numbered stations are points to observe and have questions and commentary in the following pages.



# Walking the Trail

## The trail is in two parts

1. A walk around the streets surrounding the science museum and through Imperial College London.
  - The trail guide for the walk is on the previous page.
2. A visit to the History of mathematics and History of Computing galleries in the Science Museum.
  - The trail guide for the visit comes after the walk instructions.

## In General

- Enjoy the walk. Look around and look out for things of interest.
- I have listed 15 things to stop and look at. In each case there are some suggestions for things to look at and questions to ask. Engage with the things of interest.
- In most cases, it is best to take a few photos and jot down notes of any extra details you will need to remember. Anything complicated should wait until you get home or back to school.

## More Specifically

- This area is excellent for engaging with building and building styles. Look out for interesting features in building. Look for different styles. There are grand terraces, consider the requirements for building such large collections of similar buildings. Compare the small and quirky with the large and grand.
- The area around Harrington Road is a little slice of France in London (especially if you look down Bute Street). Find information about costs and currencies and other differences you see in the French 'way'.
- Look for posters on the street or in the banks advertising financial services. Take notes on the details. Are they good value? How would you know?

## The Trail: Things to look at and look for

1. Find the statue of Bela Bartok.
  - How old was he when he died.
  - For how many years did he visit London?
  
2. Look in the window of Douglas and Gorden and marvel at the eye-watering house prices.
  - Find the highest weekly rental and note the type of property (bedrooms, reception rooms).
  - Find a broadly comparable property to buy (freehold or leasehold).
  - Is it cheaper to rent or to buy?
  
3. Look at the building containing the café of the Institut Francais.
  - How many different shapes can you see?
  - How many different tessellation patterns?
  
4. There is strange Gothic style building at the end of the mews lane.
  - How many panels of glass are there in the leaded 'gothic' windows.
  - What is their average area?
  - Compare with a modern window nearby.
  
5. Find the statue of Baden Powell.
  - How long did he live for?
  - How old was he when the Scouting Association was formed?
  
6. Look at the old Gate House.
  - How many different sized stones have been used in the house?
  
7. Look at the Darwin Centre (notably the large glass fronted hall)
  - How much glass has been used in the building?
  
8. Find the café menus for the Dana Centre (you should come back and visit on weekdays)
  - Which is the best 'deal' on the menu, how much discount do you get?
9. Look at the terraces on both sides of Queens Gate place. The builder put all of the up together, so they have many repeated elements in the designs. Just consider the 2 terraces of three houses in the middle of the South Side and the terrace of 12 on the North side.

- Make a list of key repeated materials e.g. bricks, windows, doors, columns, etc.
- Find a way to make a good estimate of the quantities of each required.

10. As you walk along Elvaston mews, look for all instances where numbers can be seen.

- Say what the number has been used for in each case.

11. Look at 170 Queens Gate and the building opposite.

- Compare the architectural features (overall size, size of doorways, number and size of windows).
- Explain who you think they were built for.

12. Look in the entrance way for the plaques to Nobel prize winners.

- How long did they live for?

13. Find the two wall panels containing mathematical symbols.

- What do they say?

14. Find the foundation stone of the Queen's tower.

- How old is it (to the nearest day)?

15. Find the window listing the achievements of Imperial College research and the panels commemorating engineers and scientists associated with the college.

- Make a timeline for the college's achievements.
- Make a timeline for the famous alumni.

16. Enter the Science museum.

# In the Science Museum

- Walk through the main hall, past the shop and the café to the central stairs and lifts.
- Go to floor two.
- Turn right and enter the hall containing the History of Mathematics and the History of Computing.

I recommend that you choose one or more themes to gather data on and this will set you up for some extensive work later. There are many important and exciting exhibits, but they are not organised in this way. So, you will need to go to different parts of the hall to find things.

- First of all, try out any interactives and make sense of them.
- Secondly read the information in detail and takes notes of important features.
- Thirdly, take a photo to remind you of what things look like.

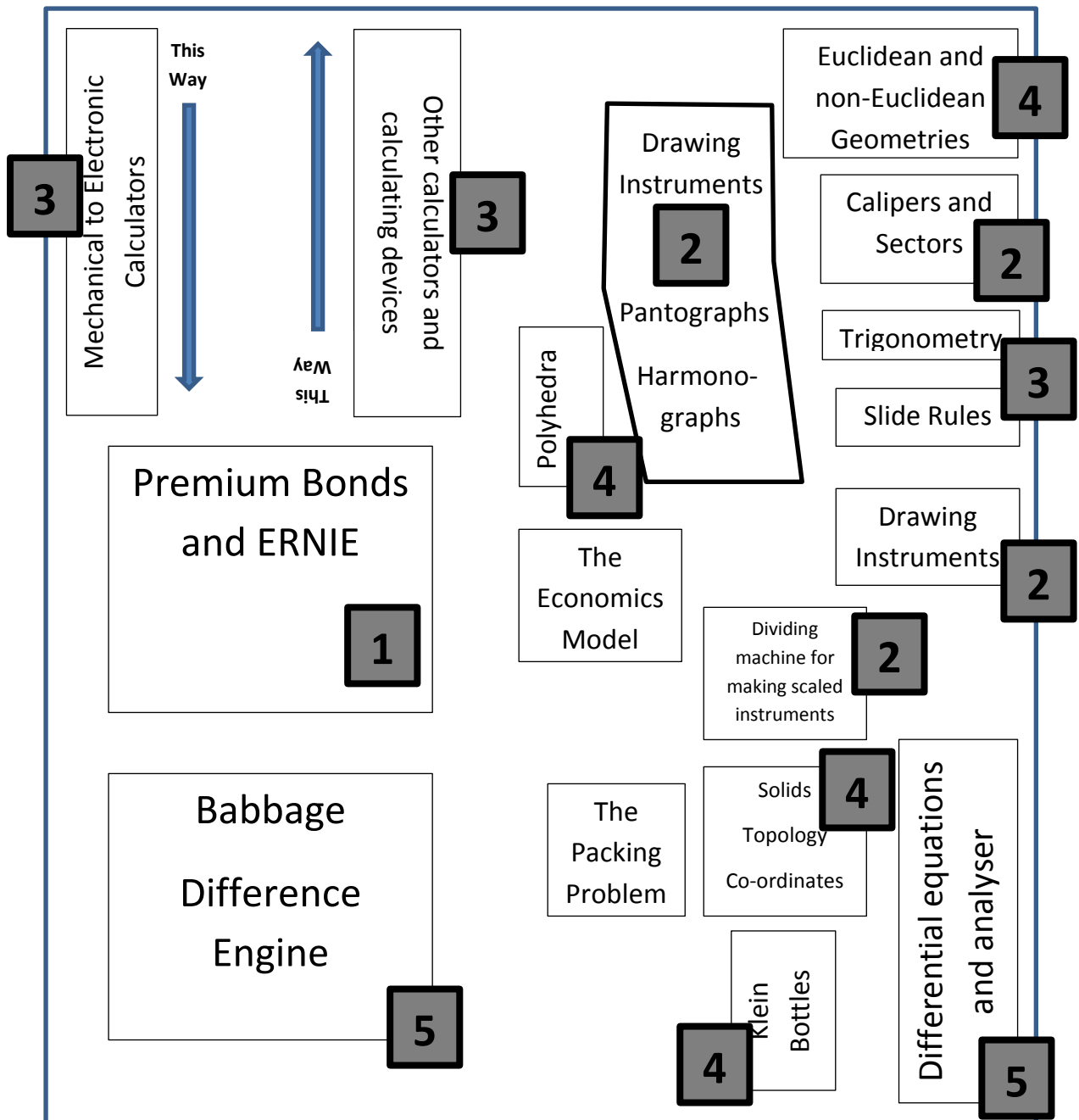
## Themes

1. Probability.
  - How does the Premium Bonds system using Ernie compare to the National Lottery?
2. Drawing and measuring instruments.
  - There are devices for drawing lines and curves of different types.
  - There are devices for measuring lengths and angles.
  - There are devices for accurately making these instruments.
  - Find some interesting examples and work out how they are used and how they were made.
3. Calculators and calculating instruments.
  - You will need to find out how a slide rule works.
  - Look for other calculating devices such as Napier's bones and the Abacus. Explain how they work.
  - Find mechanical calculators, small handheld devices and large desktop monsters for offices. You slide things or turn a mechanical handle. What for? What does it do?
  - Find the most powerful electronic calculator. How does it compare to a standard school scientific today?
4. Solids and Surfaces.
  - Look for objects in 2, 3 and 4 dimensions.
  - The two dimensional graphs are models of the forces in a suspension bridge. What is the equation of the model?
  - Three dimensional objects are categorised by their faces and stellae (points).
  - Topology provides a language for describing the essential difference between objects. How does it work?
  - Find the case of Klein bottles ... how can you make a four dimensional object?
5. Mechanical Analysis (A Level and above!).
  - Compare Babbage's difference engine to the later hand crank calculating machines.
  - What is the difference between a difference engine and a differential engine.
  - What is a differential analyser?
  - How can you solve differential equations with a mechanical device?

## Extras

1. Find the packing problem case, get your head around the problem and continue later.
2. Find the economics computer. How does it work? How good a model is it?





## Themes

- 1** Probability
- 2** Drawing and measuring instruments.
- 3** Calculators and calculating instruments.
- 4** Solids and Surfaces.
- 5** Mechanical Analysis (A Level and above!)

Lifts and Stairs

## Notes