



There's Something Stinky in the city of LONDON

HELLO THERE! MILES, SETSUKO, MADDISON AND KWAME FROM THE GEOSQUAD HERE, AND WE'RE TOTALLY TIRED-OUT! WE'VE BEEN EXPLORING LONDON ALL DAY -- CAN YOU SPOT US IN THE GET KIDS INTO SURVEY EXPLORATION POSTER? WE'RE STANDING BY A STREET LAMP AT THE BOTTOM OF TOWER BRIDGE! TALKING OF STREET LAMPS, WE'VE DISCOVERED SO MANY INTERESTING THINGS ABOUT THE GEOGRAPHICAL AND ARCHITECTURAL HISTORY OF LONDON, BUT ONE FACT THAT WE DISCOVERED HAS LEFT A RATHER BAD SMELL IN OUR NOSES -- AND IT LINKS TO LONDON'S LIGHTS! WE'VE FOUND A SERIES OF CLUES THAT WILL HELP UNLOCK THE SECRET OF THE STINK. DO YOU THINK YOU COULD YOU HELP US TO DISCOVER THE ANSWER TO OUR MALODOUROUS MYSTERY?

TASK 1:

X,Y MARKS THE SPOT

(GEOGRAPHY OBJECTIVES - LOCATIONAL KNOWLEDGE / GEOGRAPHICAL KNOWLEDGE AND FIELDWORK -- LITERACY LINKS - RETRIEVE, RECORD The answer to our stinky mystery lies somewhere in the sprawling city of London - a bustling maze of over 60,000 streets. Thankfully, we have a set of clues that will help narrow our search. Each one comes in the form of a question, and the answers to those questions will reveal a

number to add to a secret code. When the code is revealed, we will find a set of coordinates that will point us directly towards our smelly solution!

There's fifteen digits to find in total. All the questions relate to the history, architecture and geography of London, so let's get started! You can add the digits to this grid as you go:

1	2		3	4	5	6	7	8			-	9	10		11	12	13	14	15
		.							,					.					

- The first digit of the depth of the deepest Underground station - Hapstead on the Northern line (_8.5 metres)
- The third digit of the height of The Shard, currently the tallest building in London (10_6 feet)
- The third digit of the length of the Thames (21_ miles)
- The second digit of the capacity of the O2 Arena (2_,000)
- The second digit of the diameter of the London Eye (3_4 feet)
- The third digit of the height of Amersham, the highest tube station above sea level (14_ metres)
- The first digit of the maximum depth of the River Thames (_0 metres)
- The first digit of the number of stations on the London Underground tube system (_70)
- The second digit of the number of gold bars stored below ground in London by the Bank of England (400,000)
- The second digit of the day of the month that Big Ben first chimed (1_th July, 1859)
- The first digit of the length of Tower Bridge (_44 metres)
- The third digit of the area of Crystal Palace Park (20_ acres)
- The first digit of the number of visitors to the British Museum in 2019 (_,000,000)
- The third digit of the year that London hosted the Olympic Games for the second time (194_)
- The first digit of the number of staff bedrooms in Buckingham Palace (_88)

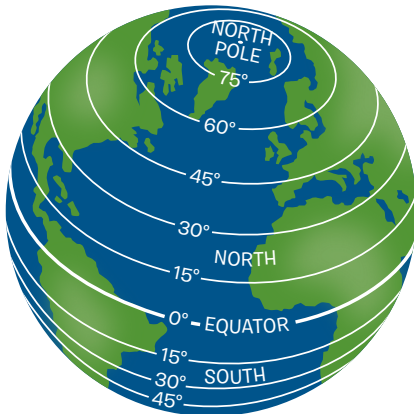
TASK 2:

COORDINATING YOUR SEARCH

(GEOGRAPHY OBJECTIVES - LOCATIONAL KNOWLEDGE / GEOGRAPHICAL KNOWLEDGE AND FIELDWORK -- MATHS LINKS - GEOMETRY: POSITION AND DIRECTION)

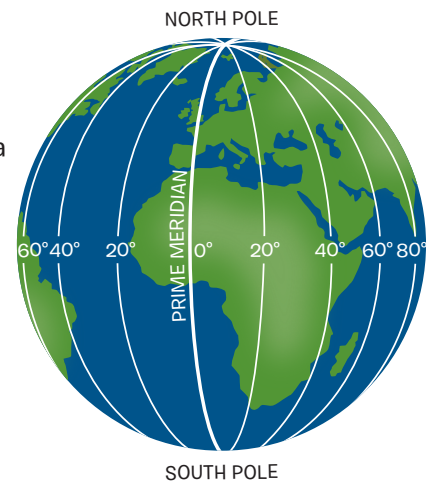
You've managed to find all the fifteen digits that make up the mystery code - but what does it mean? And what are you supposed to do with it? Well, that special code points to somewhere very specific in

London, using a system called decimal degrees: the same system that GPS technologies use to identify locations across the world. The system uses lines of longitude and latitude to split the surface of the earth into segments; the smaller the segment, the more accurate the position can be - even down to a single millimetre if you add in enough decimal places!

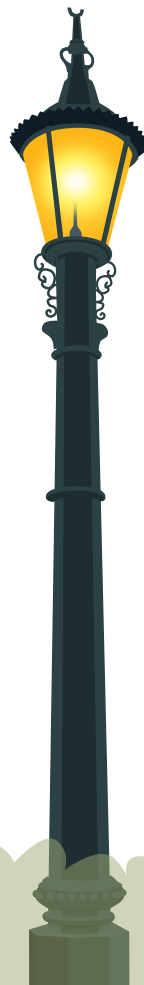


Lines of **latitude** run across the globe in a horizontal direction. The longest line of latitude is called the Equator; it runs around the centre of the Earth, and has the coordinate number '0'. The sections above the equator increase by degrees, all the way to '+90°': the position of the North Pole. It's a similar story heading the other way: the degrees decrease all the way to '-90°' at the South Pole.

The lines of **longitude** run vertically from pole to pole. The central line is called the **Prime Meridian**, and its coordinate number is '0'. It runs through Greenwich in London - which is where the term Greenwich Mean Time (GMT) comes from. The segments increase in degrees to +90° in the east, and decrease to -90° in the west.



The more these segments are divided up, the more accurate the position measurement can be. For example, a measurement with one decimal place (e.g. 25.1°) would identify an area of land 11.1 kilometres wide. A measurement with three decimal places (e.g. 25.178°) would identify an area that is 111 metres wide. And a measurement with eight decimal places (e.g. 25.1785209°) would mark a position that was only 1.11 millimetres wide! That's probably less than a fingernail clipping! You can put two of these decimal degree codes together to point to an exact spot anywhere on Earth. For example, if you searched an online map for the coordinates 53.483088, -2.201009, you'd end up at the players' pitch entrance at Manchester City's home stadium! If you searched for the coordinates 34.134027, -118.322149, you'd be standing at the bottom of the 'H' of the famous 'HOLLYWOOD' sign! And if you search for the special code that you found, you'll discover the answer to the stinky mystery of London's fart-powered lamp!!



Did you find it? Yes, that's right - that secret code points to London's last remaining 'sewer gas destructor lamp' - a streetlight that runs on the power of stinky bottom-burps! (Or 'biogas' if you want to be posh and proper!) The lamp, which still works, is located on Carting Lane - sometimes referred to as 'Farting Lane', for obvious reasons! As funny as this may seem, it was a really important part of the revolutionary sewer systems built in the late 19th century to combat the massive health problems that the unsanitary conditions in London were causing. They'll be more on that in the next task! For now, congratulations on solving the stinky mystery!

TASK 3:

Bioenergy Breakthrough

(GEOGRAPHY OBJECTIVES - GEOGRAPHICAL KNOWLEDGE AND FIELDWORK /
D&T OBJECTIVES - DESIGN, MAKE, EVALUATE AND TECHNICAL KNOWLEDGE)

You may well have heard of The Great Fire of London (1666), and The Great Plague of London (1665-66), but have you heard of The Great **Stink** of London? In the summer of 1858, hot weather worsened the smell of untreated human and industrial waste, creating a stench in the city that was so bad, laws were passed to stop people dumping sewage in the Thames. The mistreatment of water systems in London already had a history of contributing to the spread of dangerous illnesses. In 1854, a physician called John Snow realised that Cholera was spreading through the water in London, and stopped the illness in its tracks by removing the handle of a water pump in Soho (51.513347, -0.136610).

In 1859, civil engineer Joseph Bazalgette led a massive project to build a vast sewer system below the streets of London in order to carry the waste away safely - including the sewer gas destructor lamps, which burned away foul-smelling sewer gas. This project would form the basis of London's sewer system today. The Get Kids into Survey Utilities Exploration Poster shows the important work that Surveyors do to help build, maintain and fix sewer systems.

For your final task, upgrade the sewer gas destructor lamps for the 21st century by creating an invention that runs on pump power! It doesn't have to be a streetlight - it could be anything from a vehicle to a factory machine. Just make sure you include a way to get the gas into your invention, (i.e. would it have to be put into a container first, then fed into your invention, or would your creation link directly to the sewer?) and include a detailed explanation of how it works!

