

# The O<sub>2</sub> Maths Trail

## Teachers Notes

The O<sub>2</sub> Maths Trail has been specifically designed for KS2 pupils by Greenwich Education Business Partnership. It is designed to develop an awareness of the regeneration of Greenwich Peninsula and The O<sub>2</sub> by using them as a resource for learning.

The trail assignments reflect the requirements of the National Numeracy Strategy and give opportunities for practising a range of skills including:

Numeracy Skill	Topics	Relevant questions in the trail
Numbers	Addition, Subtraction, timetable, division & mental maths	1,3,9,14
Shapes & Space	Shapes, tessellations, symmetry & coordinates	2,6,8,10
Data & Probability	Graphs, tally charts & frequency	16
Measure	Measure, perimeter, time, money	4,5,6,7,13,15

The trail takes approximately 45mins - 1 ½hours to complete depending on the ability of the students and how many questions you want to do.

The trail has been split into 3 sections. The start point for the trail is North Greenwich Station continuing through the Peninsula Square and finishing in The O<sub>2</sub>.

Ideally students will be working in small groups to complete the challenges with support from an adult to guide them in the right direction.

The student booklet consists of 16 questions for the students to complete whilst they follow the trail with supplementary questions which can be completed at home or back in the classroom.



Questions that can to be complete back at school or at home.

**Please Note that information indicated (i.e. prices) in this document are subject to change. Materials updated August 2009**

## Answers to the trail

# North Greenwich Station

The first 4 questions of the trail are based at North Greenwich Tube Station. To answer these questions the students will need to find an information board with a tube map and a timetable for stations on the Jubilee Line. These are located at the front of the station by the bus stops. Students do not need to access the actual station.

- Count the number of stations on the following lines:  
 Jubilee **27**      Victoria **16**      Bakerloo **24**
- What are the map coordinates of the following station?  
 North Greenwich **D8**      Baker Street **C4**      Wimbledon **F3**
- What is the minimum number of stations I need to pass when travelling from North Greenwich to:  
 Vauxhall **9**      Holburn **8**
- How long does it take to get to the following stations from North Greenwich?  
 Wembley Park **43 mins**      Stratford **12mins**      Waterloo **14mins**

### BACK AT SCHOOL

What time do I need to get a train from North Greenwich in order to be at the following station for 7.30pm?

Wembley Park



Stratford



Waterloo



## Answers to the trail

# Peninsula Square

The next 3 questions are based in Peninsula Square.

- All the white lines on the group in Peninsula Square are the same distance apart. Estimate the distance between two lines? **Actual distance is 18.1m**
- What shape is the base of the spire? **Equilateral Triangle**  
Estimate the length of one side of its base **Actual Length 2.5m**

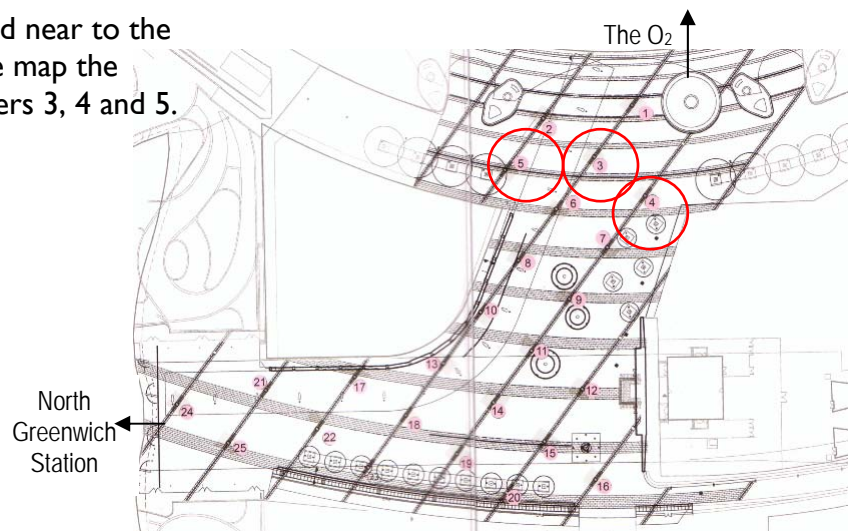
### BACK AT SCHOOL

What is the perimeter of the base of the spire?  **$2.5m \times 3 = 7.5m$**

If a London bus is 4.5m high and the spire is 10 buses tall, what is the height of the spire? **45m**

- Hunt out the paving stones to find out the answers to the following:  
In what year did John Flamsteed establish GMT **1676**  
How far away is the North Pole? **4,282 km**  
How far away is the South Pole? **15,736km**

All of the stones are situated near to the entrance of The O<sub>2</sub>. On the map the stones are located at numbers 3, 4 and 5.



### BACK AT SCHOOL

Which is nearer to The O<sub>2</sub> the North or South Pole? **North Pole**

What is the distance from North to South Pole?  **$4,282km + 15,738km = 20,020km$**



5. Look at the sign for the indigo<sub>2</sub> Club. Draw all the letters and indicate which ones are symmetrical. Indicate the axis of symmetry with a dotted line.



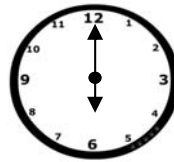
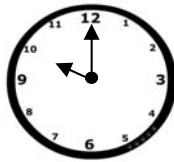
### BACK AT SCHOOL

What CAPITAL letters of the alphabet are symmetrical?

A, B, C, D, E, H, I, M, O, T, V, W, X, Y

6. Go to the Slug and Lettuce and complete these clocks.

Opening time      Closing time      Families welcome up until



How many hours is the Slug and Lettuce open for? **13 hours**

7. Answer the following questions about the VUE cinema

How many steps are there up to the cinema?	<b>48</b>
How many screens are in the cinema?	<b>11</b>
What is the price of a ...	
Child ticket	<b>£5.65</b>
Adult ticket after 5pm	<b>£8.20</b>
Family ticket	<b>£22.60</b>
100g of pick & mix sweets	<b>£1.25</b>

### BACK AT SCHOOL

How much money is saved by buying a family ticket rather than tickets for 2 adults & 2 children?   
 $(2 \times £5.50) + (2 \times £8.00) = £27.00$   
 $£27.00 - £22.00 = £5.00$

How many grams of pick & mix sweets can I get for £5.00?   
 $(£5.00 / £1.10) \times 100 = 455g$

Multiply the number of steps with the number of screens  $48 \times 11 = 528$

8. Stop at Spur steak & grill and find out the following:

How much is the cheapest salad on the menu?	<b>£6.95</b> (caesar salad)
How much is the most expensive item on the menu?	<b>£49.95</b> (spur steak challenge)

### BACK AT SCHOOL

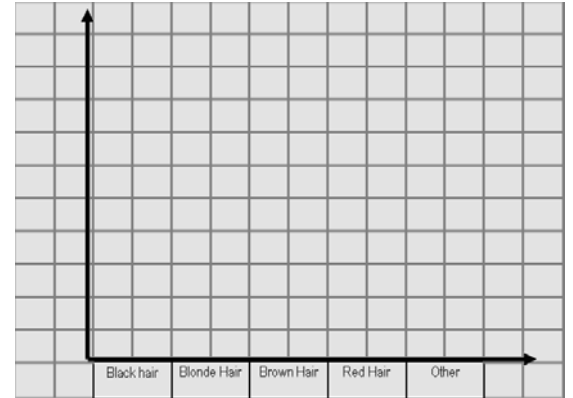
What is the difference between these two prices?  $£59.95 - £6.95 = £53.00$

How much do the two items cost together?  $£59.95 + £6.95 = £66.90$

How much change would you get if you paid for both items with three £20 notes?   
 $£20.00 \times 4 = £80.00$   
 $£80.00 - £66.90 = £13.10$

9. Due to the nature of this question being a data collection exercise, there are no one correct answer.

Colour of hair	Tally	Frequency
Black		
Blonde		
Brown		
Red		
Other		
Total		25




To reward the students who have completed the trail, there are two free activities which would appeal to the students that you could let them do. Listening to music in O<sub>2</sub> Chill or dance in a pop video in O<sub>2</sub> Create.

# North Greenwich Station

Find a tube information board and map


**1** Count the number of stations on the following lines:

Jubilee  Victoria  Bakerloo




**2** What are the map coordinates of the following stations?

North Greenwich  Baker Street  Wimbledon




**3** What is the minimum number of stations I need to pass when travelling from North Greenwich to:

Vauxhall  Holborn



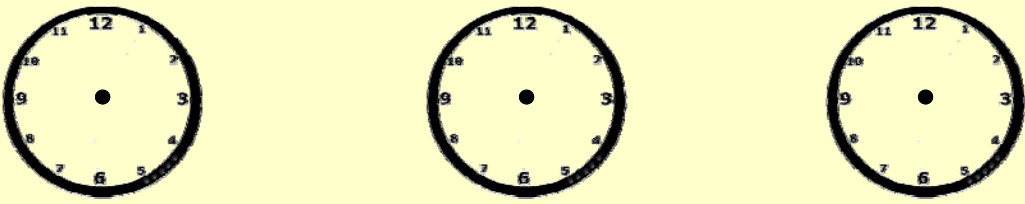
**4** How long does it take to get to the following stations from North Greenwich?

Wembley Park  Stratford  Waterloo



**BACK AT School!** What time do I need to get a train from North Greenwich in order to be at the following stations for 7.30pm?

Wembley Park  Stratford  Waterloo



# Peninsula Square

**1** All the white lines on the ground in Peninsula Square are the same distance apart. Estimate the distance between two lines?

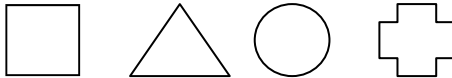


Estimate the distance from the station to the large blue wall with the screen.

*Hint: Use giant steps and count the white lines*

**Look at the Peninsula Spire. This structure is made of stainless steel and is the tallest of its kind in the UK.**

**2** What shape is the base of the spire?



*Hint: Use pigeon steps then measure your foot*



Estimate the length of one side of its base.



What is the perimeter of the base of the spire?

If a London bus is 4.5m high and the spire is 10 buses tall, what is the height of the spire?




**25 paving stones containing text are located on the white lines in the square.**

**3** Hunt out the paving stones to find the answers to the following:

In what year did John Flamsteed establish GMT?

*Hint: Head towards The O<sub>2</sub>*

How far away is the North Pole?

How far away is the South Pole?

*At 11:06hrs on the 17th May each year the mast shadow is centred on this stone*



Which is nearer to The O<sub>2</sub>, the North or South Pole?

What is the distance from North to South Pole?

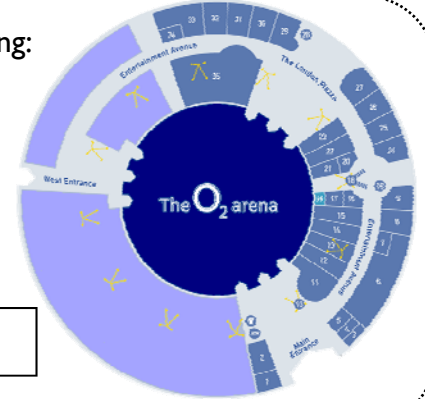
# The O<sub>2</sub>

**1** Look at The O<sub>2</sub> information map and find out the following:

What is 19

What is 28

What is next to the toilets?



**2** Find out or estimate the following about The O<sub>2</sub>.

The seating capacity of The O<sub>2</sub> arena

The seating capacity of the indigO<sub>2</sub> Club



If all the tickets in the arena and indigO<sub>2</sub> Club were sold for £20.00 each, what would the total value be?

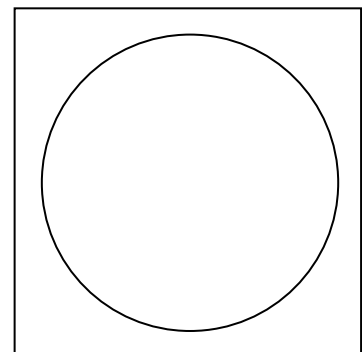
How much money would be lost if 10% of the tickets were not sold?

What is the difference between these two values?

**Look around you at the different buildings in the main entrance area of The O<sub>2</sub>**

**3** Look for this shape on one of these buildings. Complete this design

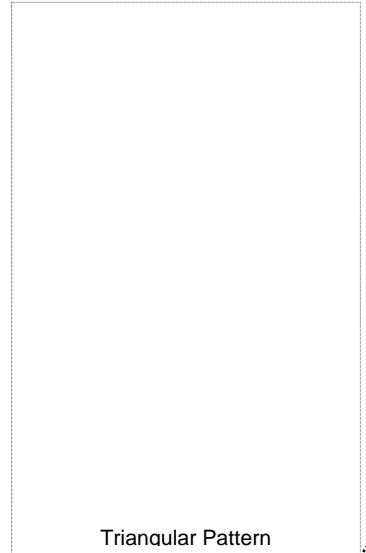
How many segments make up this shape?



**4** Draw the pattern of triangular tiles that can be seen above the entrance to Union Square

What is this type of tile pattern called?

Look around and see if you can find any more tile patterns and draw them below



## Walk down Entertainment Avenue to IndigO<sub>2</sub>

**5** Look at the sign for the indigO<sub>2</sub> Club. Draw all the letters and indicate which ones are symmetrical. Indicate the axis of symmetry with a dotted line.

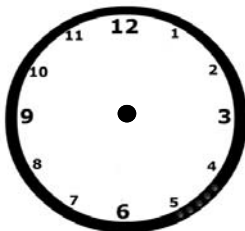
What CAPITAL letters of the alphabet are symmetrical?



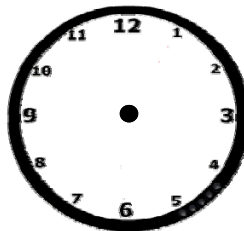

**6** Go to the Slug and Lettuce and complete these clocks.



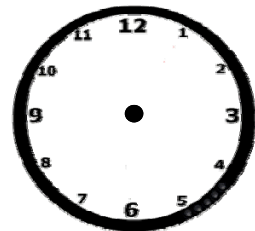
Opening time



Closing time



Families welcome up until



How many hours is the Slug and Lettuce open for?

**7** Answer the following questions about the VUE cinema



How many....

What is the price of a ...

Steps are there up to the cinema?

Child ticket

Adult ticket after 5pm



Screens are in the cinema?

Family ticket



100g of pick & mix sweets

How much money is saved by buying a family ticket rather than tickets for 2 adults & 2 children?



How many grams of pick & mix sweets can I get for £5.00?

Multiply the number of steps with the number of screens?



**Continue down Entertainment Avenue**

**8** Stop at Spur Steak & Grill and find out the following:



How much is the cheapest salad on the menu?

How much is the most expensive item on the menu?



What is the difference between these two prices?

How much do the two items cost together?

How much change would you get if you paid for both items with FOUR £20 notes?

**Next to Las Iguanas restaurant is a large open space called The London Plaza. This area can be used for lots of different activities throughout the year.**

9

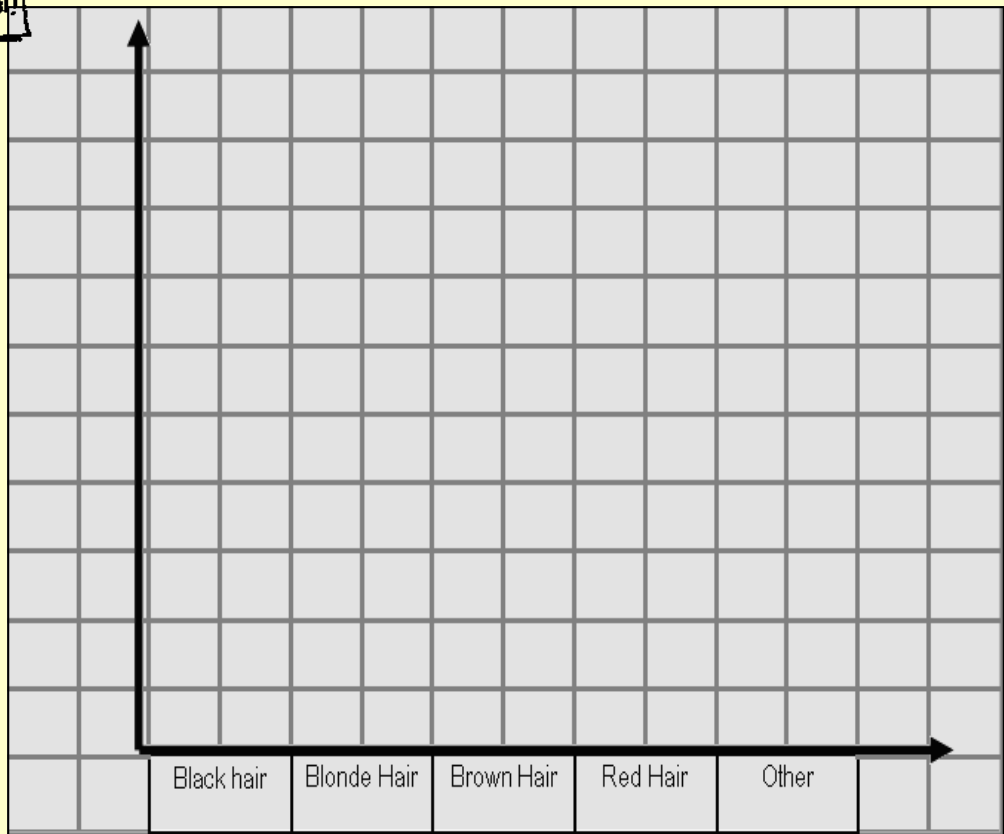
What is happening in The London Plaza Today?

Stand in the middle of The London Plaza and look at the hair colour of **25** people.  
Fill in the tally chart below

Colour of hair	Tally	Frequency
<b>Black</b>		
<b>Blonde</b>		
<b>Brown</b>		
<b>Red</b>		
<b>Other</b>		
<b>Total</b>		<b>25</b>



Using your tally chart complete the graph below.



Hair colour of the people in The London Plaza

Which hair colour is the most common?

What hair colour is the least common?