10. There are several bridges on the way to Marks \& Spencer. Stop underneath one of the bridges, look up and you will see square lights in the roof. How many of the small squares around the light are needed to give the same area as the light fitting?

Stop in the square outside Marks \& Spencer
11a. Look at the pillars. What is this shape called?

On the base of each pillar you will find several small tiles

11b. How many tiles make a Metrounit length?

11c. How many Metrounit lengths would it take to go around the base of the pillar?

## Go up to the Upper Green Mall

12. Find the information point $\boldsymbol{i}$ and finish filling in the table started in question 5

Walk along the Upper Green Mall heading towards The Village in the Upper Blue Mall.
13. As you walk through the village draw below all the different shapes you see
14. Which of these shapes has the most lines of symmetry?

Shape

Number of lines of symmetry:

Lay out sixteen coins randomly in a four by four grid so that some have heads facing up and others tails. Example shown below:


The object of the puzzle is to turn over the coins until all show heads or all show tails. The coins are flipped according to the simple rule that at each turn you must flip all the coins in a single row, column or diagonal. Note that a diagonal can be just one coin in the case of the corners

Well done you have completed intu Metrocentre's Maths Trail
www.ncl.ac.uk/events/numbers


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## Newcastle University

คfシ ® Free Wi-Fi in centre intu.co.uk/metrocentre

## Calling all Mall Mathletes

Test your wits all around intu Metrocentre with our Mall Maths and see who comes out on top!



This is the Metrounit which will be used as the unit of measure throughout the trail. When you are asked for any length or area measurement we are asking for answers in Metrounits.

This means that you count one diameter as length 1 and one square as area 1 , using the size of Metrounit measure as found at intu Metrocentre.

Look out for the Metrounit on the balustrade as you come into the Blue Mall.


Remaining on the Upper Mall, turn right and head towards Primark. You are moving along the Upper Blue Mall. Stop at the second octagonal balcony you come to 1 .
1a. How many Octagons can you see?

1b. Estimate the length of one side of the smallest Octagon in the glass roof using Metrounit lengths

Carry on walking through the Upper Blue Mall towards Primark stopping on the balcony overlooking Exhibition Square, 2 on the map.

2a. Using Metrounits, estimate the size of the larges rectangular glass panels on the side of the lift.
Length ........................... Width

2b. Using your answer in 2a calculate the area of one of the glass panels

2c. What is the total amount of glass required to cover the outside of the lift around the door?

Staying in the Upper Central Mall, walk out of the Upper Blue Mall following signs to Town Square, point 3 on the map.

As you walk look out for the Crystal Heart chandelier.
3. The glass panels (including escalators) form a shape around the chandelier, what is the shape?

Staying in the Upper Mall, continue walking towards Town Square and House of Fraser.

Make your way to the balcony overlooking Town Square.
4a. Working in pairs, count the number of people coming up the escalator in 5 minutes. One can count the people while the other writes the information on the tally chart below.

| Men |  |
| :--- | :--- |
| Women |  |
| Girls |  |
| Boys |  |

4b. Estimate the number of males that would use the escalator in an hour.

Remain in the Upper Mall and walk towards Debenhams in the Upper Red Mall.
5. Find the information point $\boldsymbol{i}$ and start to fill in the table on the next page. Do not worry if you are not able to complete the table at this point. There will be other opportunities to do this further along the trail.

|  | Number <br> in Upper <br> Mall | Number <br> in Lower <br> Mall | Subtract <br> Upper <br> Lower |
| :--- | :--- | :--- | :--- |
| (2) Customer Services |  |  |  |
| (b) Escalators |  |  |  |
| (14) Toilet |  |  |  |
| (2) Cash Points |  |  |  |
| (4) Lifts |  |  |  |

In the Upper Red Mall, continue towards Debenhams.

6a. Make six words from the letters in
DEBENHAMS

6b. Estimate how many words can be found

Staying outside of Debenhams go through the doors on the right hand side to the picture on the wall, made of ceramic tiles

7a. In the picture, find the clock in the tower. What time is it showing?

7b. How many fish can you find in the picture?

Go back to Debenhams entrance and go downstairs here or if you need to use the lift walk along to point 8.
8. Find the information point and continue to fill in the table started in question 5 . Do not worry if you are not able to complete the table at this point as urther along the trail there will be opportunities to do this.

Carry on walking along the Lower Red Mall until you get to Town Square and House of Fraser.
9. Look around you. What shapes can you see?

Draw a circle around each of the shapes below as you find them

## $+$ <br> Square

Rectangle
Circle

Octagon


Hexagon


Trapezium


Parallelogram


Metrounit

