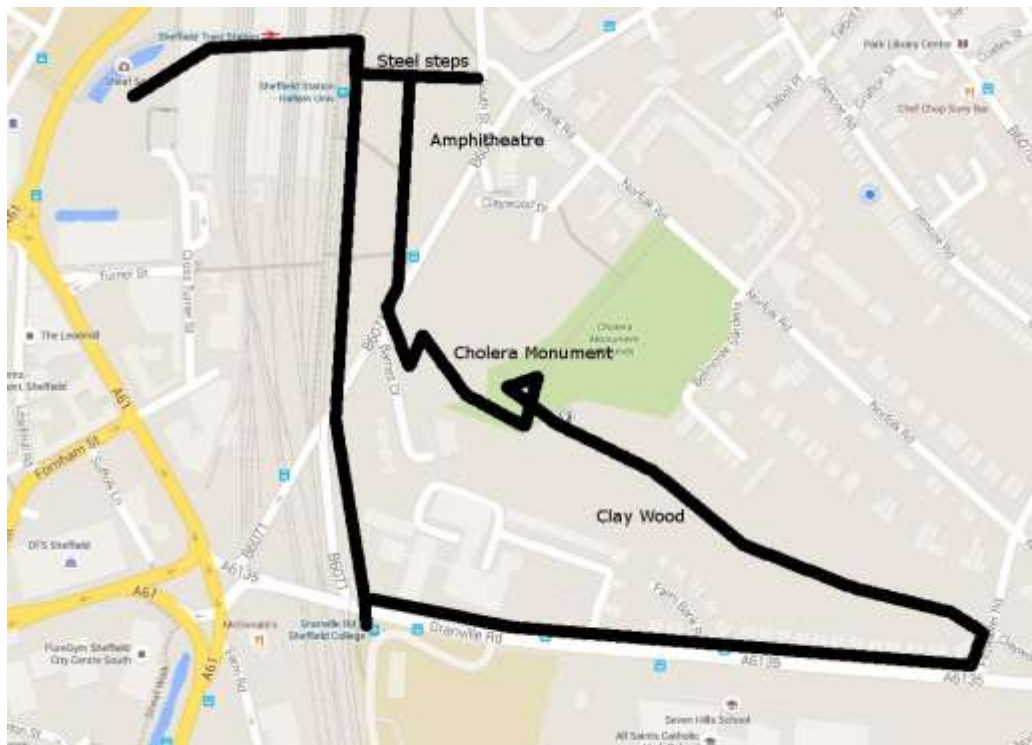


Sheaf Valley Maths Trail

You need to be in a team of 3 or 4 people. Each team will need a DIY tape measure, a ball of string, a board protractor, a pencil and a calculator.

It is very important you stay together, look after each other and take extra care when crossing roads. The map shows you where you will be going.



Sheffield City College

Look at the wind turbines on the roof.

What is the order of rotational symmetry of the big wind turbines?

Look at the little wind turbines that power the lights in the car park.

What is the order of rotational symmetry of the little wind turbines?

Look at the blue signs near the Granville Road crossing. Which one has one line of symmetry?

Supertram Station

If you arrive here at 5pm, when is the next tram to Malin Bridge?

How much would it cost for two adults and three children aged 4, 6 and 8 to travel to Meadowhall and back?

The tram tracks are always the same distance apart. What is the mathematical word for this?



Sheffield Station

Above the entrance to the station is a red and white sign. What is the order of rotational symmetry of the sign?

Look at the big electronic departure board. What time is the next train to London?

It is approximately 140 miles to London and the journey takes 2 hours 10 minutes. Can you work out the average speed of the train? (Remember $\text{Speed} = \text{Distance} \div \text{Time}$)

Go outside the front of the station and look at the Cutting Edge steel blade sculpture.

Estimate how high the sculpture is at its highest point.

Your next task is to estimate how long the Cutting Edge Sculpture is.

First measure how long your step is.



Then count how many steps you take along the sculpture. (You don't have to get your feet wet!)

Use your answers to work out how long the sculpture is.

Can you see a more accurate way of doing this? Look carefully at the sculpture.

Can you see the joins? How long is the distance between each join?

How many joins are there?

Now make a better estimate for the length of the sculpture

An average sized car weighs about 1.5 tonnes. Estimate how heavy you think the sculpture might be.

Look at the plaque near the fountain. How far below the fountain was the original Pond Tilt Forge?

How many cm is this?

How many years did the forge operate for?



How many fountains make up the water feature? (Clue- it is not a square number!)

Go back in the station and look at the iron work above the entrance that leads to the steps to the bridge. Can you work out the angle between each of the lines that radiate from the centre (see diagram)?



Amphitheatre and steel steps



Count how many steel steps there are to the top.

Measure the height of one step

Calculate the height of the hill in centimetres

Convert this to metres.



The hand rails are supported by iron bars. What shape are they?

Measure the length width and height of the bars.

Find the volume of one of the bars.

How many of these bars are there? (They don't always come in pairs!)

What volume of iron was used to build them?

Look at the seating area of the amphitheatre. The seats make a curve that is part of a circle. In maths we call this an arc.

Your next task is to find the centre of the circle. Using string mark out a straight line from the end of the first row of seats to where you think the centre of the circle might be. Do this again from the other end of the seating. If you have found the centre the two lines will be the same length. Get one person in your team to hold the end of the string where you think the centre is, while another holds the other end of the string tight and walks round the seating. If your centre is correct the string will stay tight all the way round the arc. If it doesn't, adjust the position of the centre and try again.

The string is the radius of the circle. How long is it to the nearest metre?



The diameter of the circle is twice as long as the radius. What is the diameter of the circle?

Using a board protractor measure the angle the two radii make at the centre of the circle.



What fraction of a circle is this? (Remember there are 360 degrees in a circle)

The length of the circumference of a circle is found using the formula

$C = \pi \times \text{diameter}$.

If the seating went all the way round a circle, how big would the circumference be (to the nearest metre)?

Use the fraction you worked out earlier to calculate the length of the front row of seating.



Walk up the hill to Shrewsbury Road. Cross the road and walk up the footpath to the Cholera Monument.

Cholera Monument

What is the name of the shape at the top of the monument that is immediately below the cross?

What is the name of the shape below that?

What year was the Cholera outbreak in Sheffield?



How many years ago was the Cholera outbreak?

Look at the view of Sheffield. You can see St Paul's tower, which is the tallest building in Sheffield.

Try to count how many floors it has.

How tall do you think one floor would be? (Hint: a door is 2m tall)



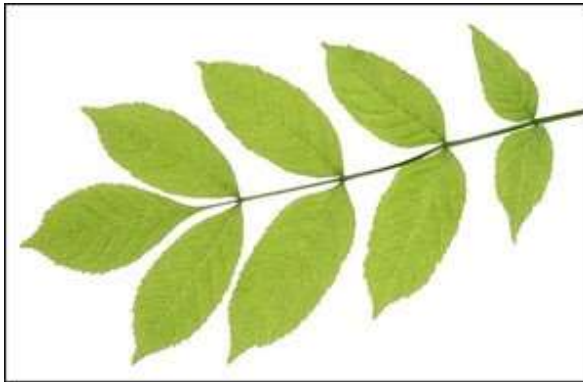
Estimate how tall St Paul's Tower is.

Claywood

Walk along the path through Clay Wood.

Make a collection of about 5 different leaves. Can you identify what sort of tree each leaf comes from? Here are 5 you will probably find.

Ash



Hawthorn



Holly



Oak



Sycamore



Which leaves have symmetry? You can use the pictures above to draw on any lines of symmetry.

Find a way of estimating the area of each leaf. (This may be easier when you get back to class). Calculate the average area of a leaf.

Look out for insects and birds. If you are lucky you might spot a rare millipede called *Melogona scutellare*



How many legs do you think a millipede has?

Clay Wood is ancient woodland and is 4 and a half acres big. A football pitch is about one and a half acres. How many football pitches big is Clay Wood?

An acre is 70 yards by 70 yards. How many square yards is this?



At the end of the path is a litter bin. What shape is it?

When you reach the road turn right onto Fitzwalter Road and turn right again. Walk down Granville Road back to College.

I hope you enjoyed this Maths Trail. Maths is all around us and is not just found in the classroom! Next time you go out and about see what maths you notice on your travels.

