

A Curriculum for Excellence

Secondary – numeracy



Pupils thrive and their minds develop best when they have free access to stimulating outdoor environments for learning. **“Where pupils use numeracy skills in ways that are relevant to them, young people can be more motivated to learn these skills and understand why they matter, in school and beyond”** Numeracy Outcomes for Curriculum for Excellence.

Measurement

Could you use the resources in your grounds to become energy self sufficient?



A multi step problem involving practical tasks to collect and record data.

- Find how much energy is used to heat the school on a daily basis - and look at the units of measurement used in ‘real life’
- Calculate how much energy is produced from a traditional method of heating – burning wood
- Calculate the volume of wood available in a tree in your grounds (the volume of a cylinder) by measuring the circumference of the trunk and the height
 - Use the length of the shadow to measure the height. Calculate the length of the shadow of a known object such as a metre stick. The ratio of the shadow:object will be the same ratio for the shadow and height of the tree

Calculate the volume of wood needed to heat your school and the area needed for this amount of trees – and map this out in the school grounds to represent the amount of energy used in heating your school.

I can solve practical problems by applying my knowledge of measure, choosing the appropriate units and degree of accuracy for the task and using a formula to calculate area and volume when required MNU 3-11a

Use the Grounds to support understanding of large numbers and areas.

Mark out with chalk/rope the size of real large objects – a dinosaur or main stage at T in the Park

Use string or chalk to represent large numbers – millions, billions etc . Find ways of representing money spent in football mergers, the distances talked about in astronomy, the amount of plastic bottles thrown away every day in the UK. How much further is a million mm than just one? How tall would a million pounds be in £10 notes?

Spend time measuring the size of an area – as small as 1m^2 to a football pitch to support their understanding. Run round the area, work out how many steps across it, relate it to other areas of your grounds.

Shape, Position & Movement



Create an accurate scale model of the school grounds

Measure the perimeter of the grounds and the footprint of the buildings to create a 2D scale map of the school.

You can compare this with aerial photography such as Google Maps or maps from the Land Management department of your Local Authority.

Calculate the height of the buildings (see above) and use these measurements to create 3D models.

I can apply my understanding of scale MTH3-17c



Pattern Hunt

Hunt for objects in your grounds and ask pupils to use a digital camera (or mobile phone) to record patterns found and any examples of rotational symmetry observed – in objects both big and small and natural and man made.

Having investigated patterns in the environment I can use appropriate mathematical vocabulary to discuss the rotational properties of shapes, pictures and patterns MTH 4-19a

Frisbee Golf

Set up a course of cone markers. Pupils have to throw from cone to cone – at each point estimating and then measuring (with a compass) the angle from North to the next cone. This can be linked to IT if use of a GPS is available.

I can name angles and find their sizes MTH 3-17a

Problem solving shapes

Give a group of pupils a length of rope tied into a loop. Ask them to pull it into given shapes and mark these on the ground.

Encourage discussion by asking the groups to do this blindfolded – they will need to discuss how far they are from each other and the angles of corners etc

Having investigated a range of methods I can accurately draw 2D shapes MTH 3-16a

