

On the trail

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The abstract nature of maths can make it meaningless to some children. All the class will benefit from getting out of the classroom to look at maths in the environment

Mathematics should include the development of... an awareness of the use of mathematics in the world beyond the classroom. (Primary Education in England (HMSSO 1978).

One useful way to get started is to take the children on a maths trail, ie a planned walk in the immediate vicinity of the school where children can observe, discuss and answer questions about some of the mathematical features in the environment.

A maths trail can be used either to provide initial experiences upon which to build when introducing a new mathematical idea in class, or as a follow-up activity designed to provide a meaningful context for the use of a particular skill, technique or concept encountered in the classroom.

Numbers

The environment provides examples of most of the mathematical topics covered in popular commercial infants' schemes.

Every maths trail for very young children should include a number search. In fact, such a search could constitute a complete activity in its own right. Here are just some of the places where children might find numbers: doors, lamp posts, fire hydrants, clocks, pillar boxes, telephone kiosks, shop windows, bus stops, buses, cars, motor cycles, trees, trams, gravestones, milestones, commemorative plaques, buildings, road signs, etc.

An unstructured approach to a number search would entail the children being asked to look for numbers in as many different places as possible and to write down not only the numbers themselves but also where they were found. Back in the classroom this could provide a wealth of discussion about the different uses we make of numbers in the outside world. Why do houses, buses and lamp posts have numbers? What do the numbers on a gravestone or a milestone mean? A more structured approach might involve the production of duplicated worksheets in booklet form with diagrams of some of the objects mentioned earlier on which children have to enter a number that they have seen in that particular context. This could lead to follow-up activities emphasising the

ordinal aspect of number: putting numbered cardfaced houses in order or filling in missing house numbers using either the odd/even or consecutive system (What would be the number of the house next to number 99 etc.); sorting and delivering letters using a simplified classroom postal code system; individual/class counting in twos - forwards and backwards, starting

in the classroom for sorting and matching activities. By matching car parking spaces with staff names children can ascertain whether there is a one to one correspondence and, if there is not, can consider possible reasons for this.

Counting activities can lead to work at different levels appropriate to the mathematical maturity of the children, and can

contribute to the development of the language of comparison. Counting the number of chimney pots per stack on house roofs can be an activity in its own right or at another level can lead to basic ideas of multiplication (one stack has four pots, two stacks have eight pots, etc.).

Comparing a window which has four rows of three panes with one which has three rows of four panes can lead to a consideration of the commutative aspect of multiplication. More able children might like to consider which is 'bigger' a window with five rows of three panes or one with four




How many different shapes can you see?

from 9, etc; ascertaining the age of a car given its registration number.

The older or more able infant might tackle problems involving the calculation of distances between towns given a diagram of a signpost or milestone (ie a pictorial representation of the problem). How far is it from A to B if A is two miles east and B is three miles west? Or they might find the age of a building given the date when it was built.

If objects such as pebbles, shells, leaves, wild flowers, etc. can be collected or observed on the walk they can be used back

Half is the missing number.

1 swing  has chairs.

2 swings  have chairs.

3 swings  have chairs.

4 swings  have chairs.

5 swings  have chairs.

chairs.

rows of four panes? (Both are 'the same' from the point of view of perimeter.) Here the concept of area is implicit and need not necessarily be made explicit, but would be a foundation on which to build in the junior school.

Other topics

Further suggestions relating to other areas of the infant mathematics syllabus are made below. (OTT refers to activities that might be done 'on the trail' and 'BC' for those carried out 'back in class'.)

Money and shopping

Finishing the prices of articles in shops, buying items, giving the correct amount, then receiving and checking your change, noting petrol prices, (OTT); comparing prices, reducing prices by given amounts, class shop activities (BC). Addition, subtraction, multiplication and division using data (BC).

Time

Noting the time at the beginning and end of a walk, clock faces, and times observed on route; pillar box collections; stop opening times - hours, days. (OTT) Use collected data (BC).

Shape

Recognising, naming and drawing shapes found in buildings, the playground, roof tile patterns, book covers, mosaics, road signs, etc. (OTT) Fitting 2-D shapes together; making simple tessellations; pattern making, mirrors and symmetry; model making using simple 3-D shapes (BC).

Length

Using arbitrary units (feet, paces, hands) to measure things, finding the longest/



Work sheets can give direction to activities.

tablet/linked object; comparative language of measurement (higher, shorter, wider, etc); perimeter (OTT).

Making plans

The first thing the teacher needs to do is set off with notebook and pencil in hand to explore the local environment. A useful starting point is usually the school building itself - inside and outside. Often the school playground or playing fields are rich in mathematical potential.

There are several different ways in which you can use the information you have collected. One possibility is to convert it into activities for children to do at five or six different places near the school, and then link these sites into one continuous maths trail. If there are problems concerning movement from one site to another or the length of time that the children will be out of school, then an alternative approach would be to make single visits to five or six local locations.

Producing materials

For the single site trail the children's activities might be written on a single sheet, whereas with a 'linked site' trail the sheets could form a pupils' booklet which might include a simple map of the route. There could also be a teachers'/helpers' booklet which would include the activities that the children are to carry out as well as make suggestions concerning important discussion points, alert helpers to potential sources of danger and list essential equipment such as clipboards, stop watch, timer, pencils, etc.

The pupils' booklet or worksheets could take the form of tick charts (see diagram above) where children indicate that they have made an observation or completed an activity requested of them by an adult. For slightly better results the booklet might include simple sentences with blank spaces to be filled in, boxes where observed remarks could be made, gravestone dates, etc. could be entered, or where simple sketches of shapes could be made.

For complete non-readers various alternatives are available. If the ratio of adults to children is high then work cards

The Shops



Ed. of tape is the telephone box.
Wants from the telephone number.
Ed. of tape is the telephone box.
Wants from the telephone number.

containing suggestions for initiating maths/ethical discussion can be provided for the helpers. These children might simply have a pencil and rough book in which to write numbers or answer simple questions asked by the teacher/helper. Cassette recorders can be used to record discussion between adults and children, and between the children themselves. These recordings can be used effectively back in class to promote further discussion when children and teachers have had time to reflect on their findings, or they can act as a stimulus for follow-up activities.

A more expensive but thoroughly worthwhile addition is to take photographs of the different locations on the trail in order to remind the children of what they have seen and to provide further mathematical discussion.

As well as offering a context for the study of many of the mathematical ideas to be found in the infant school syllabus, a maths trail can provide a stimulus for the extension of these ideas in the more formal classroom setting, and can sometimes lead to a whole term's work built around the trail.

The actual process of planning the activity can sensitise teachers to the maths/ethical potential of the environment and help them to develop an overall 'maths across the curriculum' approach to the infant curriculum. As HMJ succinctly put it, 'If mathematics is not seen to be needed or used explicitly in project work and in other subjects within the curriculum, then the claim that mathematics is a useful subject must sound rather hollow to the pupils'. Mathematics from 5 to 16: Curriculum Matters (HMSSO 1985).

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