Mathematics around us:
a mathematics trail around
the Institute of Education, Singapore

Berinderjeet Kaur

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A Mathematics Trail Around the Institute of Education, Singapore

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Singapore

INTRODUCTION

The concept of producing Mathematics Trails has been explored as a way of developing an appreciation and enjoyment of mathematics in everyday settings, usually to complement work in the classroom. It is hoped that through such trails the belief that mathematics is a series of definitions, theorems and standard exercises all confined to the textbooks will be dispelled.

THE MATHS TRAIL

This "Mathematics Trail" (see appendix) was offered in the cause of providing something different for the 'IE Exposition Day - theme : Creativity in Teaching' on 17th March 1990 but at the same time something that may be of interest for mathematics teachers and their pupils.

In agreement with Cockcroft Report that: "As children explore the world around them, mathematical experiences present themselves alongside others. The teacher needs to seek opportunities for drawing mathematical experience out of a wide range of children's experience." the purpose of the trail was to stimulate interest in using the environment to generate some meaningful mathematics and engage pupils in interesting and fun-filled activities or mathematics lessons.

The inspiration arose from the Mathematics Trail around the City of Melbourne as part of the ANZAAS Festival of Science (26 - 30 August 1985) produced by the staff and students of the Monash Mathematics Education Centre.

Very broadly the aims of the trail are

To help each individual develop as far as is possible, his appreciation and enjoyment of Mathematics itself

To give pupils an opportunity to experience mathematics in everyday situations

To provide an opportunity for the teacher to present the pupils with realistic mathematical work

To help pupils develop imaginative thinking and gain aesthetic pleasure from the mathematics of the trail.
The trail is divided into 5 "sites", some consisting of a number of "locations" on the campus of the Institute. One may take 1 to 2 hours to complete the Trail.

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The trail has not been designed with any particular age or ability range in mind of either students or teachers, but simply as an example of what might be done to help develop the appreciation and enjoyment of mathematics in everyday situations and to complement work in the classroom.
MATHS TRAILS

Though this trail is specific to the Institute of Education (Singapore), the general principles behind it could easily be adapted for any area. The purpose of sharing this paper with the conference participants is to stimulate interest in using the environment to generate some meaningful mathematics.

Teachers may want to design such trails in the immediate vicinity of the school and perhaps use them for data recording while following the trail, as well as work to be undertaken in the classroom. For such exercises it is necessary that teacher preparation include

- the teacher familiarising himself with the trail and hence
- being able to draw out the salient features through discussion en route and
- consolidating this with suitable follow-up work and further extension work as appropriate.

Undoubtedly the success of any such venture, of course, depends upon the thorough preparation of the teacher. In any mathematics lesson

"Pupils need explicit help, which can only be given by extended discussion"

as stated in the Cockcroft Report and

"Also after an interesting experience there is an urge to talk about it and this can deepen the interest and also help to communicate it".


CONCLUSION

The author felt that the whole experience of producing the trail was well worthwhile and would recommend the idea to teachers as an aspect of in-service training. Again as in the Cockcroft Report:

"It (in-service training) can be directly specific to the needs of the school and the pupils, so that those who teach mathematics develop professionally as a result of working together to improve the work of the school."
REFERENCES


Appendix A Maths Trail around the Institute of Education, Singapore
A Mathematics Trail
around the
INSTITUTE OF EDUCATION

17th MARCH 1990
Exposition Day
CREATIVITY IN TEACHING
Introduction

The idea of producing "A Mathematics Trail Around the Institute of Education" as part of the Institute's Exposition Day activities has grown out of similar work in Melbourne by the staff and students of the Monash Mathematics Education Centre in 1985.

This "Mathematics Trail" hopes to offer something that may be of interest both for the mathematics teachers and their pupils. It has not been designed with any particular age or ability range in mind, of either students, teachers or adults, but simply as an example of what might be done to help develop an appreciation and enjoyment of mathematics in everyday situations and to complement work in the classroom.

The trainee mathematics teachers from the institute who trialled it and the author have all enjoyed themselves and have learnt something more, both of mathematics and of the Institute of Education. Hope you will do the same.

Happy Maths Trailing!

Berinderjeet Kaur
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Singapore
March 1990
INSTRUCTIONS

1. Follow the Trail Map and Instructions contained in this booklet starting at the "Trail Corner".

2. On completion of the Trail, participants must return to the "Trail Corner" to check answers and establish their "successful completion" for the award of badges.

3. "Trails" will not be issued after 3.00pm and participants must be back at the Trail Corner by 4.45 pm.

4. Please be aware of Road Safety at all times.

REQUIREMENTS

1. The main requirements are a pencil or pen, a measuring tape and preferably something to rest the booklet on when writing.

2. A measuring tape may be borrowed from the "Trail Corner".

3. A calculator, although not essential, will be helpful. It is possible, however, to complete the trail without the help of a calculator.
Start of the I.E. Maths Trail

* Write down the time at which you begin the trail.
A. At the start of the trail you are outside Block B facing the unsheltered plot of land between lecture theatres 3 and 4.

A1. Write down an estimate of the length of this plot of land (in metres).

A2. Write down also the breadth of the same plot of land (in metres).

A3. Find the area of this plot of land.

A4. 1 square metre of grass costs $10.00.
    How much will it cost to cover this plot with grass?
B. Outside Block B you will find Yeo’s Hot and Cold Drinks Vending Machine. To be able to purchase a hot drink, calculate,

B1. the greatest number of coins you could use.

B2. the least number of coins you need to use.

B3. In how many different ways could you put coins to the value of 40 cents into the machine?
C. Between lecture theatres 3 and 4 you will spot the bright coloured Telecoms Mail Box.

C1. What is the Box's number?

C2. Is any mail collected during IE's vacation?

C3. Mr X puts a letter in the mail box on Saturday at 3.00 pm. When will the letter be collected by the mailvan for posting?

C4. Estimate how many letters can the mail box take.
D. Outside lecture theatre 3 next to the 'Fruit Tree' Vending machine a prominent blue container is placed.

D1. What is it?

D2. What is the shape of its top cross-section?

D3. Give a sketch of its top cross-section.

D4. How high is the container?

D5. Estimate the volume of the container.
E. Enter lecture theatre 2 which is beside lecture theatre 3.

Suppose all the wooden benches in lecture theatre 2 are occupied and everybody is seated comfortably.

El. How many worksheets are required for all the students seated on the wooden benches? (Each student will only be given 1 worksheet)
F. At the zebra crossing near lecture theatre 3 take the steps to House No. 1 (Educational Research Unit)

From the carpark adjacent to House No. 1, covered steps lead all the way to the Students' Recreation Centre.

F1. Estimate the height of House No. 1 (Educational Research Unit) above the level of the Students' Recreational Centre.

[Hint: Use the height of the steps to help you!]
G. From the Students' Recreation Centre walk past the Students' Council Centre and Block A to the green circular plot of land facing Oei Tiong Ham Building.

G1. Count the number of windows of the Oei Tiong Ham Building facing the green plot of land.

G2. It takes 20 minutes to clean each window. Approximately how many hours will it take to clean all the windows?

G3. A window cleaner works 6 hours each day. How many days (approximately) will she take to complete the job?
H. Take the flight of steps next to Oei Tiong Ham Building to the Library.

H1. Note the opening hours of the Library. How many hours is the library open for a year?

H2. Alice has a 35 hour vacation library assignment to work on. If she starts work on a Wednesday and goes for lunch everyday from 12.30 - 2.00 pm, on which day will she finish her assignment.

H3. As you enter the library, to the left are cubicles for students to leave their belongings which they do not need for library use. How many students at any one time can occupy each a cubicle of a reasonable size?

H4. Find out from the IE borrowing counter, the loan period for library books and also the rate of fines.

May Ling a student of IE borrows an open shelf book on 20th January 1990 and returns it on 23rd February 1990. How much fine does she have to pay?
--- End of Trail

Return to the 'Trail Corner'
by the shortest possible route

At the Trail Corner before you
ask for an answer sheet
to check your answers
make a note of the time.

How long did the Trail take you?

WELL DONE!!