

# MiS Presentation

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- Context
- Aims
- Format & Content
- Session 1: Introduction
- Session 2: Möbius Strips
- Session 3-4: Statistics
- Session 5: Coordinate Grid
- Session 6: 1-2 Nim
- Evaluation

- This project was conducted in partnership with Our Lady and St Thomas Catholic school (OLST)
- OLST is a co-educational primary academy located in Willington for students aged 4 - 11
- OLST is a small school with only one class of 18-20 students per year
- My project was conducted with the year 6 class

# Initial consultation with school

- Increase confidence in girls ability in maths
- This goes hand in hand with decreasing maths anxiety in girls
- In the long term this could possibly increase performance in girls, increasing number of girls achieving 'Greater Depth' in SATs

- Increasing confidence
  - Belief in their own mathematical abilities
  - Nationally girls perform at a very similar level to boys in maths SATs (Gov.uk, 2024)
  - Boys tend to believe more than girls do that their intellectual abilities cause their high marks in maths (Georgiou, S. N. et al, 2007)
- Decreasing anxiety
  - Maths anxiety: feelings of nervousness or apprehension in response to a current or future situation involving maths
  - Women are more than twice as likely to experience maths anxiety than men (National Numeracy, 2024)

- Lunch time sessions about 30 minutes long
- Only girls in the session
  - Girls are said to be more confident and more likely to express themselves in a single-sex environment
  - Girls reported that they felt more comfortable and liked science and mathematics more in a single-sex setting (Baker, 2002)
- The content of the sessions is not defined by the aims

# Session 1: Introduction

The aim of this project is very individual, so it is important to get to know the students I am working with.

- What is the level of maths anxiety amongst the girls?
  - Majority of girls reported some symptoms of maths anxiety
- What are the causes of maths anxiety?
  - Judgement
  - Fear of being left behind
  - Frustration
- How can these causes be treated?

## Session 2: Möbius Strips

- Design:
  - Focus on the process rather than the outcome
  - Intrinsic value intervention
- This session involved the girls constructing and exploring the physical properties of a Möbius strip
- The aim of this session was to allow the girls to enjoy the process of exploring new ideas



Figure: Möbius Strip



# Session 2: Möbius Strips

- The session consisted of 3 main activities
  - 1 Creating the Möbius strips
  - 2 Drawing on the Möbius strips
  - 3 Cutting the Möbius strips
- Evaluation
  - The session definitely promoted curiosity and creativity (maybe a bit too much)
  - The students enjoyed the process of working through something they initially didn't understand
  - Some of the activities were too fiddly

# Session 3: Statistics - Data collection

- Design:

- Utility value intervention
- Getting comfortable discussing maths

- 1 What is statistics?

- How do we collect data?
- How do we analyse data?
- Why is statistics useful?

- 2 Students collecting their own data

- 3 Talking about maths at home

COLLECTING YOUR OWN DATA

We are going to collect our own data so we can analyse it and present it next session

Name	Eye colour (Green, Blue or Brown)	Hair colour (Black, Brown, Blonde or Grey)	Age
Lilly	blue	brown	10
Charlotte	brown	brown	6
Oran	brown	chapel grey	3
Woody	brown	bay	3.6
Kurtley	dk brown	whighet	10
Ellie	blue	brown	24
Romeo	brown	dun	

Figure: Example of data a student collected

# Session 4: Statistics - Data visualisation

- Why do we visualise data?
- Creating their own data visualisation
- Physical representations of statistics
- Evaluation:
  - Students developed understanding of basic statistics
  - Didn't create as much discussion around mathematics as planned
  - Mode of delivery was very similar to a lesson

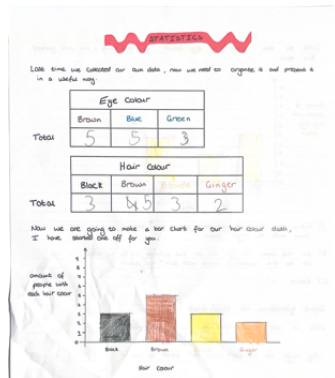


Figure: Example of bar chart created by a student

# Session 5: Coordinate Grid

- Design:
  - Change mode of delivery
  - Make the session active
  - Incorporating cooperative groups in problem solving situations
- This session involved the students solving problems which would lead them from point to point on a coordinate grid
- The mathematics required was taken from lessons I had seen the students complete
- Each student had to solve one clue to lead them to the final answer
- Evaluation:
  - Students were very eager to solve clues
  - Students didn't understand coordinates as much as hoped
  - The problems given were effective revision for the children - "We had to do really difficult maths that we learnt ages ago"
  - Sacrificed quantity of learning for enjoyment

# Session 6: 1-2 Nim

- Design:
  - Student ownership, developing their own tool they can use in the future
  - Students work together and share their solutions
- This session involved the students developing their own strategies for a simple game
- This task generalises allowing students to learn some basic problem solving strategies

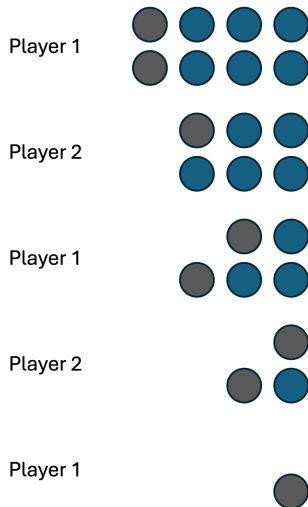


Figure: Example game of Nim

## Session 6: 1-2 Nim

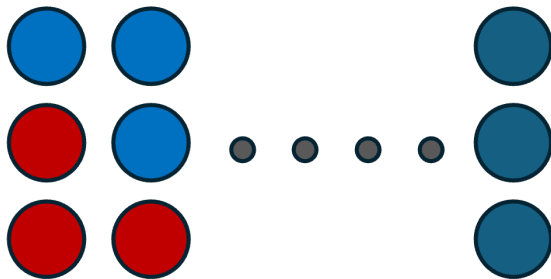


Figure: Solution to Nim for  $3n$  counters

## Session 6: 1-2 Nim

Number of Counters	strategy
1	Go 1 <sup>st</sup> take 1
2	Go 1 <sup>st</sup> take 2
3	Go 2 <sup>nd</sup> take whatever left
4	Go 1 <sup>st</sup> take 1 that whatever left
5	Go 1 <sup>st</sup> take 2 then whatever left
6	Go 2 <sup>nd</sup> take 1 or two then whatever left
7	Go 1 <sup>st</sup> take 1 then two or one
8	Go 1 <sup>st</sup> take 2 then take the rest

Figure: Example of a student's table of strategies

- Evaluation:

- Students were keen to complete the task as they wanted to win
- Some of the more uninterested students seemed to benefit from this type of session

- Increasing maths confidence
  - Noticeable increase in participation throughout sessions
  - Difficult to distinguish causes of increased confidence
- Decreasing maths anxiety
  - All students are willing to volunteer answers in sessions, which they may not do in regular maths lessons
  - Maths anxiety was definitely still present in some cases
  - Many methods for dealing with maths anxiety are outside of the scope of this project



"I enjoyed doing your sessions but I still don't like maths lessons"