

for gifted Year 3 and 4 children

with a love of mathematics

## ***'The Bottlebrush Bunch and the Mystery of the Sunny Hills Time Capsule'***

***..a mathematical thinking and problem solving adventure***



**G.A.T.E.WAYS** is an independent organization offering challenging and enriching activities and experiences to develop and extend highly able children. This *JOURNEY* for both girls and boys will run over four mornings.

The Bottle Brush Bunch were 'BFF' and always went round together. The members, Billie, Jack, Alex and Mica, had recently volunteered to clean up their school, Sunny Hills Primary's, old shed which had recently come to light after the gardener had cut away the thick blackberry vines which had entwined the structure, making it inaccessible. The children spent hours cleaning the shed and eventually came across a little cupboard in the far corner behind a stack of old timber. Inside they found an old metal case, which they suspected was a time capsule from the 1970's. Everyone knew that the capsule had been prepared for the school's 50<sup>th</sup> anniversary, but it hadn't been seen for many years, and most believed that it must have been stolen. The four children gasped with excitement when they realised what it was. They opened it with trepidation and inside they saw a letter, four books and four packages. Jack gently picked up the first book and saw the title, *The Boy who Loved Maths*.

'Oh wow, an old maths book', he exclaimed.

Alex grabbed the next book which read *Sir Cumference and the Vikings Map*.

'Cool, I love stories about Vikings and I wonder if Sir Cumference has anything to do with mathematics?' What do you think?' Brimming with excitement Mica picked up the third book *Code Breakers*.

'Oh great. I love codes. Lets' start reading!'

'NO!', said Billie sternly. 'First we have to read the letter and find the principal Mr Johns to let him know what we have found'.

If you love Maths, codes, mind benders and mystery then join the Bottlebrush Bunch on an amazing adventure back in time as they follow the instructions in the letter, explore the books from the time capsule, including *The Boy who Loved Maths*, *Sir Cumference and the Vikings Map*, *Code Breakers* and *the Further Adventures of Penrose the Mathematical Cat*, and uncover the mathematics connected to them.

### **Session 1: The Erdos Number of 1**

Billie slowly read the letter. It was dated such a long time ago in 1970 and was written by a little boy called Stuart, who was the same age as she and the boys were now. As she read about his life back then, Billie realized how different life must have been, with no mobile phones, no widespread internet and so many more things that seemed so strange. They learnt that Stuart, the author of the letter had been a student at Sunny Hills Primary where the Bottlebrush Bunch went to school, loved maths and had put his favourite picture storybooks and activities about Maths into the time capsule. The first book was about the amazing boy Paul Erdos who was a mathematical genius but could do nothing for himself, even tying his shoelaces or buttering his bread! He *LOVED* prime and negative numbers. In our first session, we will follow in Paul's footsteps as we conduct mathematical investigations and play games involving negative numbers, prime numbers and set theories. You will also start to unravel some clues about Stuart. Each session you will be given more clues about him. Will you be the student who uncovers Stuart's identity?

### **Session 2: Teem u tas seht deh**

Paul Erdos and Stuart loved codes. This session we will decode parts of Stuart's letter, which he had sneakily written in three or four different types of codes. You will explore different types of codes such as puzzling numbers, (based on coordinates) Morse code, Caesar's letter where numbers are substituted for letters, shopping list code (where a secret message has been left in a shopping list) playing cards code ( where only clubs and spades are used to depict the message), backwards codes (ekil siht) and Pig Latin (ikelay histay) Can you work out which of the codes Stuart has used so that you can find out more about him and his life way back almost fifty years ago? Not only will you solve codes but you will also write your own codes to try out on your classmates. Will you be able to stump everyone?

### Session 3: Sir Cumference and the Viking's Map

Alex opened the third book *Sir Cumference and the Viking's Map*. Inside the cover he found a map, which said: 'This map has been drawn for Xason Yellowbearyd the Viking'. Join the Bottle Bush Bunch as they read about the fiercest Viking warrior ever and how the cousins Radius and Per, two characters from the book, hunt for Xason Yellowbearyd's lost treasure. Will the two cousins discover it before their archrivals, Barnaby and his gang? What will the treasure be and how will we be able to use it to uncover another clue about Stuart? This session you will participate in mathematical activities including algebra and coordinate problems and participate in a fun treasure hunt.

### Session 4: Penrose The Mathematical Cat

The fourth book in the capsule was *The Further Adventures of Penrose the Mathematical Cat*. Just as Paul Erdos loved numbers, so does Penrose. Join Penrose as he shows you how to add up the numbers from 1 to 156 without a calculator. Really? That sounds impossible! He'll also teach you how to multiply large numbers using Napier Rods. Join him as he proves to you that  $1+1$  does not equal 2. You will be amazed by how much you can learn from a talking cat!

The Bottle Bush Bunch was astounded by how much maths they had learnt from exploring what was in the time capsule. They were also pleased that they had discovered the true identity of Stuart who was now 52 years old. Will you be able to discover Stuart's identity and return the time capsule to him?

### What to bring?

An exercise book which will be handed in each week to the presenter and a well-stocked pencil case including a pair of scissors and a glue stick. Also bring a small photo of yourself to Session 1, and a stamped, self-addressed DL envelope; Come along with a snack each week (no nuts please).

**About the presenter:** Sharon Leibowitz is an experienced educator with enthusiasm for ensuring that learning is creative, practical and enjoyable. She has specialised in the area of gifted education for over 20 years and has a passion for the development of Mathematical and Philosophical skills across the primary years. She particularly enjoys the task of designing mathematical curriculum using the 'thinking treasure' of children's literature, art and science.

