

The BRAINWAVES Club

Term 1 2021: Omegas – Years 5 and 6

Venue: Ryde Public School

Term Fee: \$285.00

WEAVING MATHEMATICAL MAGIC

Meet Algernon and Georgia the inseparable twins. Algernon loves experimenting with algorithms and discovering how letters work with numbers whilst Georgia is fascinated with geometry, especially experimenting with geometric shapes. Together they often venture off on mathematical explorations to discover how often algorithms and geometry work together to solve problems. You are invited to join these twins in finding how weaving the mysteries of algorithms and geometric shapes with ICT reveals the extraordinary magic of mathematics.

6 February

Meeting 1: In Your Prime

Focus: Prime Factorisation, Algebra, Square Numbers, Excel

Way back in 1742, a famous German mathematician a famous German mathematician, Christian Goldbach, conjectured that every even number is the sum of two prime numbers. Algernon is excited to test this conjecture and take it further by carrying out his own prime number experiment. You will join him as you use Excel to find all the prime numbers less than 1000 and then use algebra to test Algernon's theory that whole numbers can be arranged in rows made up of prime numbers. You'll need to look out for square numbers too as we *Goldbach* in time to visit this tantalisingly simple-to-understand conjecture with more mathematical implications than you can imagine. ***Please bring a laptop with Spreadsheet software loaded, preferably Microsoft Excel.***

20 February

Meeting 2: Mosaic Ain't So!

Focus: 2-D Geometry, Algorithms

Georgia is fascinated in the configuration of two-dimensional shapes of polygons and wants to create mosaic patterns with them. She is confident that they don't all interlock and has requested your help with constructing the first ten different regular polygons to work out which have properties that allow them to be used in her mosaic. Algernon will be working alongside you as you work on the different algorithms for each polygon so you can construct them accurately. After applying these two different methods for constructing regular polygons you will be able to help Georgia create mosaics with those that match. ***Please bring: a compass, protractor, ruler and very sharp HB pencils.***

6 March

Meeting 3: You have Gauss to be Kidding Me!

Focus: Algebra Formulae, ICT

Algernon and Georgia have heard of a famous mathematician, Carl Frederick Gauss, who as a young primary school student amazed his teacher by rapidly calculating the sum of all integers from one to a hundred. In this session, we will look at how he used algebra formulas to calculate this and other related number patterns. Gauss also applied geometric constructions to prove his conjecture on the properties of polygons. We are now several centuries on from Gauss and can use technology as a quicker method for calculating Gauss' formulas, including formulas for calculating the properties of regular and irregular polygons. ***Please bring a laptop with Spreadsheet software loaded, preferably Microsoft Excel.***

20 March

Meeting 4: Is This Machine Learning?

Focus: Circle Geometry, Algebra, ICT

Having learnt of the latest research into machine learning Algernon and Georgia have scoured the Internet for Apps they could use to apply to their own discoveries. Imagine their surprise when they downloaded the free Geogebra software package and discovered it worked! You too can share their discoveries as you apply it to see if you can calculate the algebra and geometric properties of circles. You will find using GeoGebra's tools for constructing regular and irregular polygons reveals so many more fascinating properties and an easy method for creating Georgia's mosaics. ***Please bring a laptop with Geogebra Classic6 loaded: [download here](#)***

What to bring:

Please bring a notebook and a well-stocked pencil case to each meeting as well as a hat, drink and snack for the break (no nuts please).

About the Presenter: Katrina Sims

Katrina has a Master's Degree in Gifted Education. She has taught enrichment mathematics classes for gifted students in the primary system as well as mathematics to students in Years 7 to 10. She is a member of the Australian Mathematics Trust Challenge Problem Solving committee and has a keen passion for problem solving in mathematics. Katrina is the recipient of a National Excellence in Teaching Award and a BH Neumann Award for her contributions to Enrichment of Mathematics for Australian Students.