GATEWAYS
The BRAINWAVES Club

Term 3 2021: Omegas – Years 5 and 6
Venue: Ryde Public School
Term Fee: $285.00

PATTERNS IN MATHEMATICS THAT SHAPE OUR LIVES

"*Math is sometimes called the science of patterns.*"
American Mathematician Ronald Graham
"Mathematics is not a contemplative but a creative subject"
British Mathematician G.H. Hardy

How often have you asked the question, "When am I ever going to use this maths concept?" or "Why do I have to learn these algorithms and use this mathematical equipment?" It's amazing how in the most unlikely of times and places, mathematics is very handy to help you solve a problem. From growing vegetables, playing volleyball, travelling back to Ancient civilizations and rescuing a cat that has lost its way, we will discover answers to your questions.

24 July
Meeting 1: **What has Mathematics Got to do with Growing Vegetables? -What do garden tools have to do with mathematical tools?**
Focus: **Introductory Quadratics, linear measurement and algebra.**

For their major fundraising event, the local primary school principal has given the Year 5 and 6 students a square piece of ground to grow vegetables to sell at the local weekend markets. To attract bees to fertilise the vegetables the students have decided to plant a row of flowers around the perimeter. However, before they can even purchase vegetable and flower plants, the students need to calculate how wide to make the vegetable patch and the width of the flower bed. Sounds simple, but only if you have the right mathematical tools. Omegas, you will be identifying and assigning variables, setting up algebraic expressions, use substitution and transposition of formulas. The aim is to form a quadratic equation and then solve it so that you can create a thriving garden.

7 August
Meeting 2: **Winning at Volleyball – Gaining the winning edge**
Focus: **Introducing how Parabolas work; graphing, ICT**

In a few weeks, the Daring Dragons, will play in their volleyball grand final. They have only just scraped in with a last game win and it is time to work on strategies if they are going to take away the shining trophy. How can they aim the ball over the net to avoid their opponents sending it back over? A sound understanding of parabolic paths will help! We can model the motion of a volleyball mathematically to determine how high and how far it will go for different sets of variables. This will require graphing several calculations manually and using ICT. Having completed the calculations, it will then be necessary to test the mathematical modelling predications by throwing tennis balls in the air. **You will need to bring a laptop with Geogebra Classic 6 loaded.**

21 August
Meeting 3: Introducing the Ancient Persians to Information Technology
Focus: Geometry and ICT

Thousands of years ago the Ancient Persians decorated their homes with beautiful tiles, not by using mathematical instruments, but by drawing circles and ruling straight lines. At this meeting, we are going to create those beautiful polygon designs exactly as the Persians did. Using this technique, we will then come rushing back into the twenty-first century as we create these same tiles on our laptops. Although the technology might be different, we will still only draw circles and rule lines.
You will need to bring a laptop with Geogebra Classic 6 loaded.

4 September
Meeting 4: Stuck in a Maze
Focus: Coordinate Geometry

The family cat, Clementine, is a very curious feline and loves to investigate new places. On this occasion, she has entered a drain but has become disorientated, can't find her way back to the entrance and is now heading in the wrong direction. Fortunately, she is wearing a tag on her collar which records her movements on a phone app. Having finally located Clementine you will have to lead her out of the drain - not an easy task when the drain is a mass of mazes! Luckily, your GPS map will help you identify the coordinates for the tunnel which will get her out. Copying these coordinates and placing them on a graph you and your partner should be able to help Clementine escape the drain. Then you'll need to program a robot to check her escape route and to guide her out. Hopefully, Clementine will cooperate with you!

What to Bring:
Each week please bring an A4 notebook and a well-stocked pencil case. Please also bring a hat, drink and snack for the break (no nuts please).

About the Club Leader: 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.