

The **BRAINWAVES** Club

Term 3 2021: Neutrinos – Years 5 and 6

Venue: Ryde Public School

Term Fee: \$285.00

YOUR SPHERICAL NATURE

The world is ours, so we should learn how to take care of it, right? Despite what some people might try to tell you, the Earth is a sphere, and like Shrek (and onions), it has many layers. Join the Neutrinos as they peel back the layers and learn what lurks beneath them. What lurks beneath our feet? Why are there so many kinds of rock and how do they get made? Where does water come from and can it run out? What keeps the atmosphere from just floating off into space? How does skydiving and hot air ballooning work? If the Earth is a sphere, how do we make flat maps? During this program the Neutrinos will develop an understanding of the large and complex structures and processes that take place in each sphere, and how these layers interact.

24 July

Meeting 1: Can You Dig the Lithosphere?

Focus: Chemistry/Physics

Journey to the centre of the Earth in order to explore its layers and structure as you model and learn about the rock cycle. Using lollies, you'll understand how immense pressures and incredible temperatures over inconceivable amounts of time result in the wondrous variety of rocks that constantly inspire collectors and treasure hunters alike. Lastly, you will investigate how the size and beauty of large natural crystals found in rocks depends on where and how magma cools.

7 August

Meeting 2: Dip Your Toes in the Hydrosphere

Focus: Chemistry

"Don't get set into one form, adapt it and build your own, and let it grow, be like water. Empty your mind, be formless, shapeless — like water. Now you put water in a cup, it becomes the cup; You put water into a bottle it becomes the bottle; You put it in a teapot it becomes the teapot. Now water can flow, or it can crash. Be water, my friend." - Bruce Lee

Life on Earth depends on water, but why? It seems so harmless but in the right conditions, it can dissolve almost any substance and carve waterways and cave systems through solid rock. You will piece together how water moves through every part of our environment (including through us!) in the hydrological cycle. You will model melting, boiling and freezing and be able to explain these phenomena using the kinetic theory of matter and you'll create your own cloud inside a bottle, to help understand the science behind them.

21 August

Meeting 3: Put Your Hands Up in the Atmosphere

Focus: Physics

There is more to air (gas) than you might think, this seemingly colourless, odorless and weightless substance has so much going on when we look at it closely. Dive through 40 km of the layers of the atmosphere with Felix Baumgartner, skydiver, daredevil, and BASE jumper as he jumps to Earth from the stratosphere. Neutrinos will analyse the forces acting on Felix as he reaches terminal velocity. You'll learn how air pressure results in flight and apply the Bernoulli effect to levitate objects. Take flight with the power of hot air and unleash the power of an air zooka to knock over towers. You'll leave with a f-AIR-ly impressive understanding of this fascinating substance.

4 September

Meeting 4: Number Spherists

Focus: Mathematics

Isn't it a little bit crazy that some people still think the Earth is flat? It will seem especially silly to you once you learn that the Ancient Greeks measured the radius of the spherical Earth 2300 years ago with nothing but a stick, some mathematics and the Eratosthenes technique. We'll use our understanding of this method as a starting point to investigate a number of theories such as geometric dot patterns, divisibility, primes and perfect numbers.

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 Club Leader: Jeremiah Galea

Jeremiah is a science and mathematics teacher with ten years of experience engaging students in private, selective and public schools. He is fascinated by the ways that maths, science and art overlap in nature and society, which is often a theme in his presentations and units of learning. Jeremiah has expressed this fascination creatively with screen writing, film making, and poetry. In 2016 he co-wrote and co-produced an award-winning science fiction short film which was selected in film festivals in Sydney, Montreal and Brussels. Jeremiah has been fortunate to collaborate with a diverse range of students, including gifted and talented students over the past decade. He believes that children growing up in the age of information, with an increasingly automated future where technology is ubiquitous and omnipresent, need critical and creative thinking skills. This is more important for young people than ever before.