

The **BRAINWAVES** Club

Term 3 2021 | Neutrinos | Years 5 and 6
Venue: Forest Hill Secondary College
Term Fee: \$285

Meeting 1: Sense-Sational
Focus: The Senses

How many senses does the human body possess? Can you name them all? Can you trick your senses? How many senses do we use to taste something? What happens when we can't use one or more of our senses? And just what does our brain have to do with any of this? Learn to observe your world with more than just your eyes. We will spend our time looking at how each of our senses work and putting our own senses to the test with a series of experiments to see how easy we are to fool.

Meeting 2: Information Light
Focus: Photonics

A photon checks into a hotel and is asked if she needs any help with her luggage. She says, "No, I'm travelling light."

Photonics is the science and technology of generating and using light and other forms of radiant energy where the quantum unit is the 'photon'. Photonics manipulates light's unique properties with lasers, fibre optics and electro-optical devices so that we can solve problems and make many areas of life easier. Today Neutrinos you will learn about the scientific concepts underpinning this exciting field and learn about some of its common applications. You will investigate the behaviour of light through a series of hands-on activities, make your own spectrometer and measure the speed of light.

Meeting 3: Mini Motors
Focus : Electric Energy

If you have a scientific mind you may already know all about how electrical batteries work! If you love playing around with wire and batteries, you may have built circuits with solar cells! But do you know how most of our electricity is generated? Most of the electricity we use is generated using the interaction between magnetic and electrical fields. This meeting the Neutrinos will learn more about the awesome power of electrical energy. We will explore the link between electricity and magnetism to investigate how electric motors work. You will then need to apply this knowledge to build an electric motor. Warning: this session will be totally ELECTRIFYING!

Meeting 4: The Future Is Cool

Focus : Cryogenics

At what temperature does water freeze? Is it 0^o Celsius, 32^o Fahrenheit, 273.15 Kelvin? The answer is far more complicated than it first appears! Scientists have found liquid water as cold as -40 degrees F in clouds and they have even cooled water down to -42 degrees F in the lab. How low a temperature could it be cooled to? Can ice be used to preserve living things? Today the Neutrinos take an in-depth look at the science of cryogenics (the process of preserving a dead body with liquid nitrogen in the hope of bringing it back to life in the future) and its applications, including super-conductivity. This session is going to be cool!

About the club leader: Simon Matheson

Simon is a physicist by training and has been involved in education one way or another for most of his life; first as a student, then as a secondary school science and maths teacher, and most recently as a developer and presenter of science outreach programs with CSIRO Education. Simon's enthusiasm for science education is grounded in the belief that all citizens of the modern world need a firm grasp of the principles upon which science (and, by extension, the world around us) are built.

What to bring

Each week please bring a well-stocked pencil case (including scissors, good textas and coloured pencils, pens and/or writing pencils, sticky tape or a glue stick) and an A4 notebook.