

The GATEWAYS BRAINWAVES Club

Term 3 2021: SciSpies – Years 1 and 2

Venue: Ryde Public School

Term Fee: \$285.00

DISCOVERIES THAT CHANGED THE WORLD

If a visitor from the past were to land in our world, they'd find it hard to believe their eyes. We may not have flying cars yet, but we do have drones delivering pizza, and Google Home and Alexa are our own versions of the all-seeing, all-knowing crystal ball. We are so advanced in medicine and biology that we even have a database for building life and can design babies with traits of our choice! This semester, the SciSpies will learn about some of the greatest inventions and discoveries of our time. We'll cover a wide range of topics - from black holes to remote sensing, gene editing to cloning and beyond. Get ready for a semester packed with wonderful discoveries!

24 July

Meeting 1: The Broader Picture

Focus: Astronomy, Astrophysics, Remote sensing

Space science has had a huge impact on the evolution of many of the technological luxuries we have today and will continue to play a major role in their future. According to United Nations Office for Outer Space Affairs (UNOOSA), there are 4,857 satellites in space, and this is increasing as the race for dominance over our skies continues between nations. From providing surveillance, to forecasting weather, from monitoring changes in biodiversity to facilitating communication, these satellites are used for a wide range of applications. SciSpies will investigate different types of satellites, including their functions, how they communicate and how they orbit around the earth. Finally, we will make our own model of a satellite, decide how we could best put it to use, and put it in the correct orbit.

7 August

Meeting 2: I Will Live Forever!

Focus: Chemistry, Sustainability

Did you know every bit of plastic that has ever been created still exists today? Plastic is an invention that has literally changed the very face of the earth – and will leave it changed forever. We play with it, eat with it, drink with it, wear it, write with it, pay with it, wrap objects in it, store things in it... I could go on all day. This week we will discover how different types of plastics and polymers are synthesised and reused. We will get our hands dirty, making our own polymers and testing their properties. We will sort your plastics by grade and analyse percentage use compared with ease of re-use. ***Please bring some plastic waste from home such as plastic bags, plastic bottles, (clean) cling wrap, etc.***

21 August

Meeting 3: Changing Planet

Focus: Chemistry, Biology

The movie series *Ice Age* has really funny parts on the surface, but some of Scrat, Diego, Manny and Sid's adventures allude to much more serious underlying issues that we see in the world around us today. Global warming and climate change are the results of one main problem: increasing carbon dioxide emissions. In this investigation, SciSpies will discover why this seemingly harmless gas causes us so many issues? We will learn how changing temperatures are affecting different species and use modelling software to see how scientists predict the geographical range shift of animals and plants. We will calculate our carbon footprint and how much each of us are contributing to global warming.

4 September

Meeting 4: The Building Blocks of Life

Focus: Biology, Genetics

Did you know we are 60% the same as a banana? How can this be? In this meeting, we will look to the building blocks of life (DNA) for an explanation. We have come a long way since Watson and Crick first described the structure of DNA and we are now in the process of creating a catalogue of the DNA of every single species on earth. SciSpies will get hands on with the DNA helix and make their own strand of DNA. Can you crack the code to build the complementary strand? Then the SciSpies will look at genetics in action and create a family tree as they trace a trait through the 'generations'.

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:

Anu Vijayan is a Science Outreach Officer for the NSW Government. She has double Master's in Conservation Biology and Research. She has worked as an assistant researcher in Behavioural ecology at Macquarie University and Program Presenter at Taronga zoo. She is passionate about all things with fur, feather and chlorophyll. Anu worked as a VFX artist for a decade with various studios around the world before changing careers to follow her dream of saving the world. Anu aims to make science fun and interesting to young minds while encouraging them to be problem solvers and world changers!