

The **BRAINWAVES** Club



Term 1 2021: SciSpies – Years 1 and 2

Venue: Ryde Public School

Term Fee: \$285.00

SCISPIE BIONEERS

Did you know that the Speedo swimsuit was inspired by shark skin and the Japanese Shinkansen (bullet trains) were inspired by Kingfisher birds? The desert fog water filters were inspired by beetles and Velcro was discovered by Georges de Mestral when he observed the burrs from burdock plants attached to his dog's fur... *Voila* – the inspiration for Velcro. Some of our most amazing technologies have been inspired by nature. More and more designers are seeking sustainable engineering solutions from our natural world. We have before us more than a three-billion-year history of evolution by natural selection! As budding scientists, we are going to explore this for our own personal inspiration! This semester, SciSpies will dive into the world of biomimicry and learn about the significance of biodiversity, adaptations, physiochemistry, nature-inspired designing and we will design our own solutions to some real-world issues using biomimicry.

6 February

Meeting 1: One Problem, Many Solutions

Focus: Biology, evolution, adaptation, aeronautical design

During this meeting, SciSpies will learn about how different organisms have adapted and evolved differently to cope with the same problem all around the world. Convergent evolution resulted in birds, butterflies and bats all having wings but with different structures. We will take a deeper look at how these structures differ in function and learn about some other techniques of flight in the natural world. Inspired by these natural solutions we will create our own flying machines and test them out.

20 February

Meeting 2: Things are Changing!

Focus: Chemistry, climate change, sustainable solutions

SciSpies will move into our venue's kitchen to work on some kitchen science this meeting. What makes popcorn pop and milk curdle? We will look at different reactions between acids and alkalis that are commonly found in the kitchen. SciSpies will then ponder on some of the bigger chemical reactions that are affecting the world. We will connect this kitchen chemistry knowledge to today's climate and learn, via experimentation, how are greenhouse gases changing the climate? We will work on some sustainable solutions to carbon emission inspired by nature.

6 March

Meeting 3: It's Getting Too Hot in Here!!

Focus: Conservation, biodiversity

The natural world is a very delicate balance and removing even one piece can disrupt a whole ecosystem. In this meeting, SciSpies will learn about keystone species and their importance in the natural world. We will conduct an experiment to assess the impact of climate change on coral reefs. We will investigate the changing ocean chemistry as a result of global warming and greenhouse gases. SciSpies will also assess the impact of mass coral bleaching on the Great Barrier Reef.

20 March

Meeting 4: I Will Survive!

Focus: Biology, ecology, astronomy

Did you know that Aboriginal medicines helped European soldiers from seasickness in World War II? SciSpies will get a taste of how human society survived before the industrial revolution and modernisation. We will explore how nature provided for all our needs. SciSpies will delve into the world of medicinal plants, bush tucker and some handy tips to survive if lost in the bush. Once equipped with this vital information, we will help a castaway survive in a jungle and find their way back to civilization. A floating compass will form part of our survival kit, but what else do you predict we will need?

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: Anu Vijayan

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!