The BRAINWAVES Club

Term 2 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 dessert 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.

24 April
Meeting 5: Laws of Attraction
Focus: Physiochemistry, Biology
SciSpies will look at the inner working of organisms in this meeting. How does large tree manage to get water from km below the ground, all the way to the topmost branches? Why do water droplets stick to flower petals and leaves? How do water striders float on water? Let's investigate adhesive and cohesive forces in nature. We will look at some real-world examples where people have put these forces to use in technology. SciSpies will conduct experiments on the surface tension of different liquids and then draw inspiration to create a useful product.

8 May
Meeting 6: Save the World!
Focus: Genetics, forensics, Environmental DNA (eDNA)
This meeting, SciSpies will explore how genetic data is changing all aspects of life. From crime solving to conservation to a cure for cancer. SciSpies will learn about the world biggest genetic database and how to search it for information. We will extract DNA from real samples. We will also learn about techniques like DNA fingerprinting and solve some puzzles with DNA sequences. Finally, we will pick genetic sequences from a gene pool and create unique patterns on a butterfly.

22 May
Meeting 7: Hypothesize This!
Focus: Experimental Design, probability, statistics, maths
In science, everything is tested whether it be a theory or a new design. In this meeting, SciSpies will test a hypothesis and draw conclusions. We will explore different theories and test them all out after analysing them for confounding factors, using replicates to find the best possible solution. It all sounds very scientific, doesn't it!? We will also conduct a statistical analysis to see if we have a significant result. SciSpies will learn about real-life scenarios and experiments where hypothesis testing is crucial!

5 June
Meeting 8: Biomimicry
Focus: Biomimicry, sustainability, design thinking
In this final meeting of the semester for SciSpies, we will put all that we have learnt to good use. SciSpies will learn more about nature-inspired product designs and steps to create their own design. SciSpies will go out into nature to find a solution to a set problem, form a hypothesis, determine a solution in nature, adapt it to their set problem and finally design their own solution. At the end of this intense session SciSpies will present their creations to class and explain how their design will solve the problem they set out to fix.

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!