

The GATEWAYS BRAINWAVES Club

Term 3 2021: TechnoKids – Years 3 and 4

Venue: Ryde Public School

Term Fee: \$285

SPACE INVADERS – ‘To Infinity and Beyond’!

We are leaving planet Earth! As the population grows, we must explore new horizons for the preservation of mankind. Which planet will be able to sustain life? Is it one yet to be discovered or is it one we know? Rover robot Perseverance, recently landed on Mars and may give us answers about the ‘Red Planet’. This mission was unmanned but let’s explore the challenges that astronauts and their futuristic machines might face if they were travelling to Mars. As they say, it’s not just about the destination but also the journey. A lot needs to go right for humans to have a chance to walk on Mars. Let’s see if we can tackle some of those challenges together.

24 July

Meeting 1: Rover Robotic Arm

Focus: Engineering, coding

Perseverance is now on Mars! This latest Mars rover was sent to explore the Red Planet to hunt for signs of ancient life and to collect rock samples. Perseverance has many amazing features including an automated mechanical arm. In this meeting, TechnoKids will be challenged to build an automated arm with two pincers that can manipulate and transports objects over a short distance. The amazing Lego Mindstorms with touch sensors will help us to get the job done! Using the Mindstorms Library, we will add sound effects for added impact to complete our mechanical build ready for Earth... or Mars!

7 August

Meeting 2: Mars in 3D!

Focus: Physics, creating.

Three dimensional (3D) means an object has width, height, and depth, however a 2D object does not have depth and thus is flat. As our eyes are spaced apart, each eye sees the same 2D view, but from a slightly different perspective. The brain puts the 2D image from each eye together, giving us a 3D view of the world. This is how we can perceive depth. Unfortunately, when looking at a regular photo we see it in 2D. Wouldn’t it be great if we could put on some special glasses and view photos in 3D? Well, we can! In this meeting we will make our very own special glasses to view photos of Mars. It’s going to be out of this world! And we can take home our glasses and a photo to share the experience with other! Super cool!

21 August

Meeting 3: States that Matter! Is there ‘water’ on Mars?

Focus: Coding

Is there water below the surface of Mars? Can we find evidence to prove that there once was water on Mars? In this meeting we will begin by reviewing the three states of matter; solid, liquid and gas. A simple example of this is an ice cube – water - steam. Then we will write some code that will determine the state of matter, depending on what input the Microbit receives. TechnoKids will learn about the features of solids, liquids and gases to do this. Can you compress a gas? Can a gas be changed to a solid? Is there a fourth state of matter? And just like Perseverance which is currently drilling and looking for any past signs of water on Mars, TechoKids will also research below the surface of Mars as they attempt to answer the same question. Let’s code up our Microbit and explore... because it really does matter!

4 September

Meeting 4: Attack! We need your help!

Focus: Coding

Excitement is building, we are on our way to explore distant planets! But all is not well, we are under attack! Those pesky aliens are attacking our rocket ship. What can we do to stop them? Applying our coding skills to the Scratch based coding platform can help us escape this threatening situation. In this meeting we will write code that enables our rocket ship to be armed and dangerous. It's a tribute to the all-time classic arcade games of the past. (Did your parents play arcade games when they were kids? Ask them 😊). Let's not forget to add a counter that gives us points for every alien spacecraft we destroy. It's a game of skill that will test your nerves. Are you ready to save the planet?

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: Karl Easton

Karl is a passion advocate of all things STEM. His position as a primary school Digital Technologies Coordinator and Teacher sees him working daily in the area of robotics, coding and emerging technologies. Currently completing a Masters in STEM at Western Sydney University; he also consults and works with several educational organisations engaging new technologies. Karl believes in empowering his students with fun activities that inform, educate and motivate.