

The BRAINWAVES Club

Term 3 2021 | TechnoKids | Years 3 and 4
Venue: Alphington Grammar School
Term Fee: \$285.00

Build, Investigate and Explore!

Scientists and engineers typically construct models to explore a particular phenomenon that they are experimenting with. These models allow scientists to visualise and understand their ideas, and they can eventually lead to scientific and technological advancement. This term the TechnoKids will explore forces and movement, space and gravity, as well as design sustainability, planning and trouble shooting. Members will design, build, and program using the engineering design process as well as engaging in several open-ended challenges. They will use standard LEGO bricks, programmable LEGO bricks, and other materials to complete these design challenges. The meetings will start with activities focusing on stability in design and then move to other topics, such as gearing, weight distribution, momentum, motors and programming.

Meeting 1: Master Animators
Focus: Coding, problem solving and communicating ideas

We are going to take our first step on the road to becoming master animators. Instead of Shrek or Buzz Lightyear, we'll start by animating sprites in Scratch. By looking at how Scratch uses block code generate movement of objects, we'll work on a creative animation. We will then add sound and voices to help create a story. *The techniques you'll learn here translate equally well to film, motion graphics, game design, and animation.*

Meeting 2: Wedo Kicker
Focus: Sensors and Tally sheet

Using Wedo kits, members will build and program a mechanical leg that is motorized to swing and kick a paper ball. Based on a hands-on learning approach that actively involves students in their own learning process, instead of simply memorizing the achievements and work of others, children will be presented with challenge that encourages them to use their imagination.

Meeting 3: Wedo Goalie
Focus: Programming

Do you love kicking a footy or a soccer ball in your backyard? Isn't it annoying when you are playing by yourself and there is no-one at the goals to block them so you can develop your kicking skills? Well, here is a 'solution'! In this meeting we will build and program a mechanical, motorised goal keeper that moves back and forth to block a paper 'ball' from the goal. Meetings 4 and 5 will provide you with an introduction to robotics. You'll build LEGO models featuring working motors and sensors, connect them to a computer, and use a simple programming tool to program behaviour.

Meeting 4: Robots – Generation 1
Focus: Energy, problem solving, design

We know a fair bit about where robots are heading with lots of Artificial Intelligence, but the first-generation robots had very little built in intelligence. In this session we investigate and create a couple of first generation robots, one to take home and the other to assemble, observe and explore the mechanisms that allow them to self-propel. We make a model of a Dalek first seen on sci-fi series Dr Who and the second uses and makes a convincing looking insectoid or

robotic insect. Naming rights are yours! Each uses a different form of energy to move. Participants will be challenged to solve a range of practical problems relating to circuits through to finding the right amount of friction.

Please bring along a 9 volt battery to power the insect.

About the TechnoKids club leader: Carla Maxwell

Carla is an Art, Design Technology and Robotics teacher who has completed a Masters of Information Technology in Education (by Research) at the University of Melbourne. She has also accomplished a Bachelor of a Teaching and Bachelor of Fine Art. This has allowed her to develop a unique perspective on teaching in a creative and integrated manner. Carla continues to plan activities for students that are fun, hands-on and experience based, taking into account aspects of mathematical and scientific principles.

What to Bring

- Students need to bring a well-stocked pencil case.
- A small note book or exercise book.
- A USB.