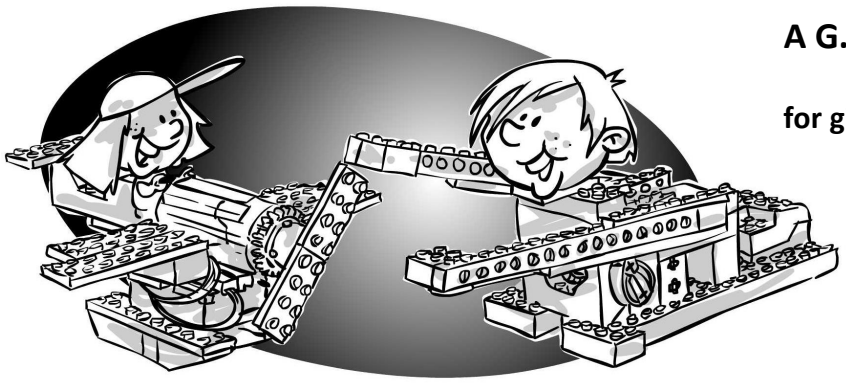

A G.A.T.E.WAYS JOURNEYS PROGRAM

for gifted Year 1 and 2 children with a love of

science, technology and construction

'What An Adventure!!'

G.A.T.E.WAYS is an independent organisation offering challenging and enriching activities and experiences to develop and extend highly able children. This *JOURNEY* for both girls and boys will run over four half day sessions and will focus on the development of children's science and technology skills. WeDo™ robotics is designed to cover a broad range of curriculum targets. It enables students to build and program LEGO models of machines and animals. This journey includes four phases of learning:

- Connect with mission and challenge
- Construct using the hands on Lego bricks
- Contemplate by creating a program sequence for your model to follow
- Continue to invent build knowledge and innovate the robot's design.

During the program you will encounter wild animals, find out about the amazing inner workings of machines and develop your story telling skills using one of the models to devise a dramatic event!

Requirements: Bring a plastic pocket book to hold handouts, a pencil case with a ruler or measuring tape; a snack (no nuts please); a small labelled photograph of yourself and a stamped, self-addressed DL envelope for the return of your report.

Session 1: Hungry Crocodile

First we will investigate the materials that enable children to build LEGO WeDo models. The set contains 158 elements including a LEGO Hub, motor, tilt sensor and a motion sensor that add movement and intelligence to the model. In this session you will build and program a very hungry crocodile. You will learn about and program the motor inside him. This session also introduces the motion sensor which can detect objects within a certain range. Once you have brought your crocodile to life you will need to train and feed it. Your challenge is to program the crocodile to snap its jaw shut when the motion sensor sees something near its mouth. When building your model you will need to identify the pulleys and belts and the slowing down mechanism.

Session 2: Aeroplane Rescue

In this session you will build and program a mechanical aeroplane that can change propeller speed as it climbs up and dives down. As we do this we will test the aeroplanes motor and tilt sensor. The latter is a small rectangular piece with curved double-angled arrows on three sides. Changing the direction of the Tilt sensor affects the speed of the motor. After building and programming your plane, you will need to study the map and with compass in hand and plan your own holiday adventure, answering the questions: Who, What, Where, Why and How. Once this is organised you will program your adventure on the computer including take off, weather sounds, stop offs, and in-flight entertainment. Lastly you will present and report on the story of Max's (the LEGO mini-figure) adventure.

Session 3: Dancing Birds

In this session the children will build and program two mechanical birds that make sounds and are motorized to dance using a pulley and belt drive system. The speed and direction of the birds can be changed using this system. After learning how to change direction and programming the Dancing Birds, teams will set up enough space to experiment with the pulleys and belts and make notes of their observations using a data table to record the changes in the pulley and belt positions and the effect on the speed and direction of the dancing birds.

Session 4: Drumming Monkey

This session focuses on a series of questions relating to the habitat and resource needs of a particular species of primate in order to create a profile about that animal. In the Drumming Monkey challenge you will build and program a mechanical monkey with motorised arm that can drum up and down on a surface. You will learn about levers, cams, and patterns of movement. In your group you will experiment with the number and position of cams, using them to make the monkey's arms drum up and down at different rates. After making notes of your observations the team will fill in a table to record the changes in the cam position and the type of tapping pattern created by each cam combination.

Carla Maxwell 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. Her Bachelor of Fine Art also gives her 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.