A G.A.T.E.WAYS JOURNEY

for curious gifted Year 3 and 4

children with a love of science

'Let's Go With the Flow'

G.A.T.E.WAYS is an independent organization offering challenging and enriching activities and experiences to develop and extend highly able children. This *JOURNEY* will run over four sessions.

High above the mountains dark clouds gather. Soon, too heavy to stay aloft, they burst in a shower of rain, releasing trillions of water drops, destined to make their way in a stream down the mountain side and into the sea. All except for Eddy, the rebellious water drop! "Come on, Eddy! Go with the Flow!" Eddy was always getting into trouble for being out of line and wanting to go his own way. He'd had enough of travelling in the same direction as all the other water drops and he was off to see the world!

A wise old water drop named Pearl called him back. "Eddy, wait! Look around you. You are surrounded by things that flow: liquid water, grainy sand, air and electricity. If these materials did not flow, people's lives would be very different. Stay with me and the other water drops, and as we flow to the sea, we will investigate, how they flow, what affects their flow and what effect their flow has on humans' lives".

This Journey focusses on the concept of flow in the context of several areas of science: chemistry, physics, meteorology and electronics. Each session is activity based, featuring a range of experiments and hands-on activities. We will learn all about the particle theory of matter and understand that it is the ability of particles to move in relation to each other that causes materials to flow. Please join us as we 'go with the flow'!!

Session 1 Sticky Liquids

Water gushes out of the tap. Honey oozes out of a squeeze bottle. Petrol flows out of the pump. One of the main properties, which define liquids, is their ability to flow. Some liquids, like water or oil, flow quickly while others, like honey or golden syrup, flow quite slowly. Some are slippery, and some are sticky. In this session you will help Eddy and Pearl investigate different kinds of liquids and find out what makes them flow, why some liquids flow faster than others, what happens when some liquids flow together and why some special liquids flow only under certain conditions. Can you imagine a world where custard bounces, you can cut milk with a knife and liquids don't flow?

Session 2 Spilling Solids

Sand pours out of a bucket. Salt sprinkles out of a shaker. Coffee tips out of a spoon. These substances are made of solid particles, but they can actually flow just like liquids. This is because they are granular. Granular materials can range in size from small powders such as sugar and flour to large objects such as rocks and boulders. In this session we will join Eddy and Pearl in investigating granular substances and see how the size, shape, texture and density of the grains affect their flow. Remember when moisture clogged up the salt shaker, some-one put a wet coffee spoon in the sugar and you poured buckets of water onto your sibling's sandcastle! Find out what happens to their flow when granular substances are mixed with liquids.

Session 3 Aerodynamic Air

As the sun shines, its rays heat the Earth. This heating, however, is uneven, because of night and day, because different surfaces, such as land and sea absorb and reflect sunlight at different rates, and because sunlight hits the equator more directly than the poles. Uneven heat creates pressure differences, and wind flows between areas of high and low pressure. Join Eddy and Pearl as they learn about high and low pressure systems, weather fronts, the formation of clouds, rain, hail and snow, the Coriolis Effect and the jet stream. What causes strong winds to blow? Why do tornadoes and hurricanes form? Although strong winds can have devastating effects, imagine what the world would be like if air no longer flowed: no more kite flying, windsurfing or sailing, no cooling breeze on a hot summer's day and no gentle rain to refresh the parched earth.

Session 4 Electrifying Electrons

Ominous dark clouds loom overhead. In the distance thunder rumbles and then suddenly there is a flash of brilliant lightning. *Lightning* is current electricity, or the flow of charged particles. In order to flow, current electricity requires a circuit. Did you know that the electric charge in a circuit can be carried by moving electrons in a wire or ions in an electrolyte? Join Eddy and Pearl as you experiment with electrical circuits, discovering what makes them work. You will test materials for conductivity, make different kinds of circuits, operate different kinds of switches, find out about fuses and circuit breakers and draw circuit diagrams. You will see a lemon battery in operation, test the electrolyte level of different liquids and problem solve when circuits are not complete. Circuit electricity powers all your gizmos. How could you live in a world where electricity does not flow?

Homework Requirements & Assessment

Homework may be set after each session to give students extra time to explore the new concepts. At the end of the program a short, written report will be completed on each student and forwarded home to parents. A copy should be made and forwarded to the school.

What to bring: Please bring a snack (no nuts please)

About the Presenter

Maureen Frith has a Bachelor of Arts Degree, a Diploma of Teaching and a Graduate Certificate in Gifted and Talented Education. She has taught for 45 years in both Primary and Secondary schools and has performed the role of Coordinator in Science and Technology, presenting enrichment and extension programs for students and professional development for teachers. She has helped to develop curricula, including VELS Science and Thinking Skills documents. She is an active member of the Science Teachers Association and the Science Talent Search Committee. For many years she has been a club leader for the G.A.T.E.WAYS Brainwaves Club. She encourages students to be active enquirers, develop higher order thinking skills and to share their knowledge and appreciation of the amazing universe in which we live.

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