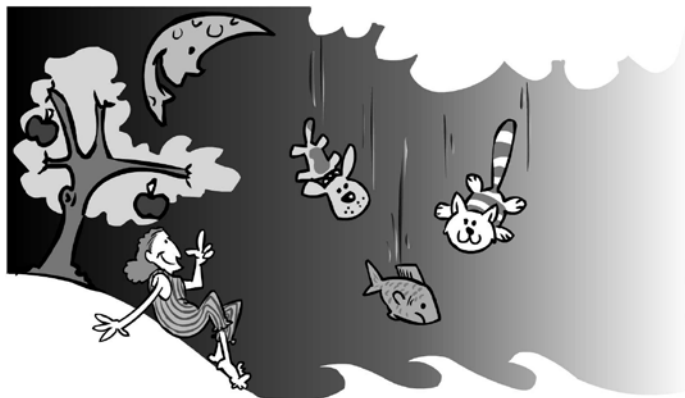


invites curious Year 3 and 4

children with a love of science to



'The Gravity of it All'

G.A.T.E.WAYS is an independent organisation offering challenging and enriching activities and experiences to develop and extend highly able children. Established in 1994, G.A.T.E.WAYS runs a range of stimulating school programs as well as the Saturday *Brainwaves Club*.

This *JOURNEY* will run over four sessions. Gravity is so omnipresent that we barely ever think about it. We live with it every day. It affects us much more than the weather and anything else in the universe. Discover what gravity really is and how it is formed. How long has gravity been in existence? Did the dinosaurs have to contend with gravity? Where does gravity fit in among the other great forces in the universe? On this journey you will do some interesting mathematics and be strongly encouraged to think critically and laterally. You will enjoy some gravity experiments as part of hands on activities. You will build on your existing knowledge and be encouraged to express your own opinions as well as engage in interesting class discussions. And it will be fun!

Requirements:

- * writing materials (pencil case) and an exercise book/notepad; and morning tea snack (no nuts)
- * bring a small named photograph of yourself to the first session – to be returned with your report – as well as a stamped, self-addressed envelope for your report. In Terms 1 and 4, a hat is required.

Session 1 GRAVITY, WHAT IS IT?

Today we will explore exactly what gravity is, how it comes about and whether it can be generated in a similar manner to electricity. Scientists from Archimedes to Isaac Newton have been intrigued by gravity. We will study some of Isaac Newton's work on gravity. We will also discuss the Foucault gravity experiment and other experiments which led to the weighing of the Earth. We will discover the difference between gravity and magnetism.

Session 2 THE RELENTLESS PULL OF GRAVITY

Today we will discover that not only is gravity universal but it also affects the universe on a grand scale. We will discuss the effects of gravity upon our solar system. We will discover things about gravity that you may never have thought of. We will then investigate whether gravity is our master or our servant. Can we do without gravity? How does gravity affect living organisms? Is it good for our health? "It's not my fault, Mum, gravity did it!" The strange fate of the Half Gravity Manufacturing Company.

Session 3 OG HOUSE

Today we will discover that trying to do ordinary things in a zero gravity house presents extraordinary problems. Breakfast could be very messy indeed. A zero gravity shower, now how could that work? Would using the toilet be a challenge, if so why? Could it be difficult or even dangerous moving furniture about on OG? A zero gravity house could be fun, but could it also be a health hazard? We will find out the true meaning of "for every action there is an equal reaction".

Session 4 ULTIMATE GRAVITY

Today we will explore the connection between mass, volume, density and gravity. We will find out how space craft use gravity. Are black holes the ultimate in gravity? We will consider how space movies have got it wrong about gravity. What about gravity and weight on other worlds? And what if there was no gravity?

Assessment and Reporting

At the end of the program a short written report will be completed on each student and forwarded to parents.

Before you come on this journey. You should find the following books about gravity at your local library. The Science Files *Forces & Motion* by Steve Parker 2004; *Gravity* from the Routes of Science series by Chris Woodford; Pages 32 to 34 of *Energy, Forces & Motion*, from the series Library of Science by Alastair Smith and Corinne Henderson. Some websites are www.com/science/forces/gravity; www.spacekids.com and also the Enchanted Learning website.

ABOUT THE PRESENTER

Herwig Waldhuber was a primary school teacher who has been interested in astronomy for almost forty years. Herwig has designed and taught basic astronomy courses, observed eclipses, occultations, transits, meteor showers and comets. He has introduced many children to the wonders of astronomy and loves seeing the response when young minds are opened to the mysteries of the universe. He has run a number of successful GATEWAY programs on a range of astronomy topics.

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