

2010

Gravity Discovery Centre – Education Kit



Brad Whitaker
Education manager

Education Programs

The cost for an educational visit is **\$12.00** per student per day. Teachers and/or parent helpers (1 per 15 students) are admitted free to the centre.

Teachers may choose from ONE of the following two programs, along with any additional activities, time permitting.

Primary Education Program (3 hrs)

Secondary Education Program (3.5 hrs)

Both Primary and Secondary programs include a morning tea and lunch break in the time specified. The Secondary program adds an additional half hour to the guided tour in order to discuss Physics principles in greater detail. Both Education Programs include the following:

- Introductory DVD
- Guided Tour
- Climb the Leaning Tower
- The Cosmology Gallery and Timeline
- Giant Pendulum Tower
- The Zadko Telescope
- Free time to explore exhibits

Additional activities

These activities are available to all excursion groups. We can adapt the standard Education Program if you would like to complete any of these activities, but have limited time.

1. **Titan Solar System Walk** (30 mins)
2. **Bush Discovery Walk** (30-45 mins)
3. **Solar Energy (Primary)** (45 mins)
4. **Biodiversity - Insectomania** (60 mins)
5. **Gingin Observatory**

Titan Solar System Walk

The Solar Walk is a 1.1km scale model walk of our Solar System, showing the planets with their moons along the way. It demonstrates the vastness of our solar system, and creates a reference point to the enormity of our Universe. Each step represents about 4 million km. This activity is usually teacher-led. Planets and their moons are marked clearly along the walk.



Bush Discovery Walk

The short bush walk (1km) and long bush walk (2km) both provide a wonderful demonstration of the extraordinary biodiversity in the Gingin area. The walks will reveal countless small animals, birds and many insects and spiders. We provide an *information sheet* for groups to take on the walks to assist in the identification of flora and fauna. The walks are usually teacher-led, but can be assisted by a GDC Guide if requested.



Solar Energy (Primary) NEW

The new Solar Energy activity is under trial in 2010 as an option especially for students studying 'Energy and Change' in the classroom. In this session students have fun racing solar powered cars, exploring Tibetan solar cookers, and investigating solar energy. This is a hands-on session focusing on the strength of our sun as a valid source of energy now and in the future. This activity is available for primary school students only.

Biodiversity Gallery – Insectomania



In the *International Year of Biodiversity*, 2010, this exciting session utilises the remarkable biodiversity of the Wallingup Plains. Students collect insect samples, identify them and locate their positions in the web of life and food chain. Part of this session is conducted out in the surrounding bushland where ideal locations for collecting insects are identified. Samples are analysed under microscope in our Biodiversity Gallery. This activity is assisted by a Guide.

Gingin Observatory

Gingin Observatory is located next door to the Gravity Discovery Centre and offers the following astronomy/stargazing educational programs:

- Daytime Solar Viewing Tour (1 hour)
- Evening Stargazing Tour (2 to 2.5 hours or tailored to suit).

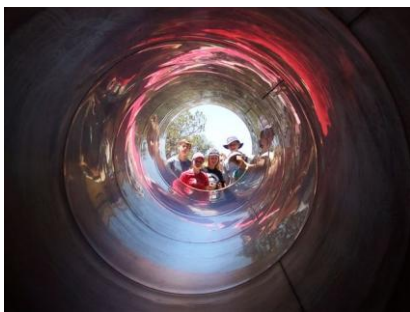
Bookings are essential and additional costs apply. Students can view the sun and moon (if available) in the daytime and an impressive selection of stars, planets, galaxies and more in the evening. An information sheet is included in this Education Kit.



Primary/Secondary Education Program –

An overview of activities

Guided Tour – A GDC guide will provide a fun and engaging tour of the site and the main exhibits hall. Explanations of exhibits are levelled towards the age and ability of your students. Guides will focus on any particular areas of learning in order to match your curriculum requirements. The tour takes approximately 45 mins for Primary students and 75 mins for Secondary.



The Leaning Tower– This is a 40 metre high platform which allows students to repeat Galileo’s famous experiments from the *Leaning Tower of Pisa*. Students can conduct free-fall experiments to investigate gravity by dropping water balloons from the tower. Secondary students can also measure acceleration, energy, air resistance, and simulate meteorites and impact craters. We supply balloons onsite. The Tower is guaranteed to be a highlight for students!



Cosmology Gallery – On the first level of the gallery is the most up-to-date timeline on display in the world. This graphic timeline depicts events in our Universe beginning from the ‘Big Bang’ and ending in what scientists predict the future to be. Students will be engaged in **fun and interactive** narratives of Indigenous cultures in relation to the stars and Universe.

The gallery also contains artworks including some stunning astro-photography and indigenous art. The building design is based on the “Buckyball” configuration and the “Penrose tiling” on the floor can be appreciated for its art and mathematics.

The Zadko Telescope – The Zadko Telescope is the largest optical telescope in WA. Its main science objective is to find and analyse the most violent explosions in the universe - gamma ray bursts - which herald the death of stars, the formation of black holes and the release of the elusive gravitational waves. In 2010 the Zadko will encourage high school participation in research that could potentially include tracking dangerous near-earth asteroids.



Giant Pendulum Tower (included in the Guided Tour) – In our pendulum enclosure students can compare the different swings of the Foucault Pendulum, Parametric Pendulum, Spring Pendulum and Coupled Pendulum. Senior school Mathematics and Physics students often choose to measure the Mass of the Earth using our pendulums. *Worksheets and formulas are provided.*

GDC Exhibits - Secondary Curriculum Links

Rotations and Orbits

Learn about the history of modern physics - from Galileo being accused of heresy, to Newton's Laws of physics and motion and how this led to Einstein's theories on *Curved Space, Black Holes and Relativity*

- View the "Breathing Mirror" a model about the elasticity of expanding space and gravity waves
- Compare models of planets rotating - Newton's gravity and attraction and Einstein's space-time
- Investigate properties of black holes and curved space and their effects on light

Magnetism and Electromagnetic Fields

Learn about and feel the effect of Magnetic fields

- The damping effect of electromagnetic currents at the Magnetic Pendulum and the Magnetic Parachute.
- Gravity and anti-gravity - see a magnet levitating in mid-air through use of electromagnet forces
- Observe the strength of magnetic force displayed by the Magnetic Force Sphere and Spring Magnet
- Ion-drive – future of space travel engines?

Light, Sound and Wave Motion

Investigate some properties of light and sound

- How they are affected by a vacuum
- Listen to the past through the large and small Time-Coils demonstrating the speed of sound in air.
- Hear the subtle sounds of the environment from inside the Aeolian Harp
- Observe the Corkscrew laser
- Observe the action of the Di Candilo Wave cable.

High School Physics presenter - Mr John Jacob

John Jacob is one of WA's most interesting and knowledgeable Science speakers. With over 20 years of experience in Engineering Research, and 25 years of experience teaching and presenting on Science topics, it is hard to find something he does not know. His presentations make complex topics easily understandable and most memorable. John is available upon request to High School groups on excursion to the GDC (at an extra cost) as well as for school visits and other functions. Costs for up to 2.5 hrs are listed on the [Booking Form](#).

Contact and additional information

Please confirm your booking by completing the **Booking Form** and faxing it to the Gravity Discovery Centre on 08 9575 7544 or email to bookings@gdc.asn.au. Upon receipt of your booking, you will be contacted by the Education Manager and receive a proposed timetable for approval.

Be aware that we require 24 hours notice for any cancellation or alterations to the proposed programs to the GDC or Café bookings.

Additional resources are available on our website. Worksheets can be provided prior to your visit or on the day of your visit, if requested. For more information on any of the Education Programs and Activities, or to organise a personalised program, please contact our Education Manager:

Brad Whitaker
(08) 9575 7577
education@gdc.asn.au

Please Remember:

- **Booking form:** Excursions are not confirmed until a booking form is sent in to bookings@gdc.asn.au or faxed to 08 9575 7544
- **Changes:** If you wish to make changes to the timetable, please contact the Education Manager, at least one week prior to arrival.
- **Student control** is the Teacher's responsibility. Our guides are not trained teachers, but are here to assist you.

Schools Booking Form

Fax to 08 9575 7544 or Email to bookings@gdc.asn.au

Contact Details

School/Group Name:	
Contact:	
Email address:	
Postal address:	
Phone:	Fax:
Mobile:	
Best times to contact:	

Booking Details

Date of visit:	Year level of students:
Arrival time:	Number of students:
Departure time:	Number of teachers/parents:
Method of payment – Invoice / Pay on the Day	
Meal requirements – Ordering from Café / Bringing own / No break required	

Education Programs

Choose ONE program plus any additional activities	<i>Tick choice</i>				
GDC Education program - Primary (3 hrs)					
GDC Education program - Secondary (3.5 hrs)					
Additional activities:					
Titan solar system walk (30 min)					
Solar Energy – Primary (45 min)					
Guided bush walk (45 min)					
Biodiversity Gallery - Insectomania (60 min)					
Gingin Observatory visit (1 hr - additional cost)					
High School Physics presenter Mr John Jacob (1.5 hr lecture \$250)					
Student Entry Cost @ \$12.00 per student	\$				
TOTAL	\$				
<i>Separate visit to Gingin Observatory to be included (ph : 9575 7740)</i>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">No <input type="checkbox"/></td> <td style="width: 50%; border: none;">Yes <input type="checkbox"/></td> </tr> <tr> <td style="border: none;">Daytime <input type="checkbox"/></td> <td style="border: none;">Evening <input type="checkbox"/></td> </tr> </table>	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Daytime <input type="checkbox"/>	Evening <input type="checkbox"/>
No <input type="checkbox"/>	Yes <input type="checkbox"/>				
Daytime <input type="checkbox"/>	Evening <input type="checkbox"/>				

Please feel welcome to contact us for any clarification of how we can assist you and facilitate your learning programs - 08 9575 7577

Stargazer's Café – School's menu

Stargazer's Café caters for all school meal requirements. All food is prepared fresh on the day of your visit. Please finalise orders one week in advance. Senior school students and all teachers may choose from the regular cafe menu on the day of visit.

Drinks, snacks and ice creams may be purchased at any time during your visit.

LUNCH/DINNER OPTIONS

Number Req'd	Choose any meals from the following options.	Price	Total
	Student Lunch Box – Ham/salad, chicken/salad or cheese/salad sandwich, piece of fruit and a fruit bar.	\$5.50	
	BBQ – Selection of sausages and/or other meat with bread and salad cooked by our chef. Vegetarian options available.	\$9.50	
	Cook your own BBQ #1- Use our BBQ facilities to cook your own lunch/ dinner. Bring your own supplies.	Free	
	Cook your own BBQ #2- Use our BBQ facilities to cook your own lunch/ dinner. We provide the cuts of meat you choose. Vegetarian options available.	Contact chef for costs	
Total			\$

NOTE: The Café Manager will contact you once this form has been received to confirm and finalise your order.

Please complete this **Order Form** & email or fax back (95757544) as soon as possible.

School Name:.....Contact Person:.....

Date of Excursion:/...../.....

Phone:



GINGIN
OBSERVATORY
THE SPACE PLACE

Educational Program Information



Daytime Solar Viewing Tour (1 hour)

View sun and moon (if available) through telescopes. Interactive and hands on. Entertaining theatre presentation on the Universe. Latest NASA missions. Educational games.

Costs: Minimum \$162.50. Up to 25 children. \$6.50 p/p thereafter.

1 teacher/leader per 15 students no charge. Coach driver no charge.

Additional teachers/leaders \$6.50 p/p. Parents \$9.50 p/p.

Evening Stargazing Tour (2 to 2.5 hours or tailored to suit)

Stargazing through telescopes. See stars, planets, galaxies and more. Laser beam sky tour of stars and constellations. Interactive and hands on. Entertaining theatre presentation on the Universe. Latest NASA missions. Educational games.

Costs: Minimum \$450.00. Up to 25 children. \$18.00 p/p thereafter.

1 teacher/leader per 15 students no charge. Coach driver no charge.

Additional teachers/leaders \$18.00 p/p. Parents \$32.50 p/p.

Not available Fri, Sat & Sun nights (Sep to May).

Bookings essential

Phone: +61 8 9575 7740

Email: stars@ginginobservatory.com

Web: www.ginginobservatory.com