Objective
The Girls in Engineering Program (GiE) is a joint initiative between The University of Western Australia (UWA) and Rio Tinto.

The GiE program aims to engage secondary school girls in the world of science and engineering and to inspire the girls to consider engineering as a career path.

Less than 12% of the engineering workforce is composed of women. This gender imbalance means the industry is significantly underutilising a key part of the workforce which is detrimental to economic productivity and growth.

Focus areas
The GiE program is focused primarily on providing outreach activities and resources to Years 7 – 10 with the aim of:

» Engaging the students through hands-on activities, during school visits, which showcase the opportunities a career in engineering can offer
» Providing the students and teachers the opportunity to participate in an on-campus GiE workshop
» Linking students with female industry engineers and university engineering students to provide mentorship
» Updating teachers and students on additional opportunities and events of interest

Initial phase
In the first six months of the program GiE established partnerships with five schools and engaged with over 280 students in Years 8 - 10 through in-school visits.

Launch
The GiE program was officially launched with over 160 guests at UWA on Tuesday 18 November 2014. Following the launch, 75 female students came on campus for a day of engineering inspired activities. This was an excellent opportunity for students to experience a university campus and meet current female engineering students and professional engineers.
Engineering activities

The GiE program has successfully developed six high school engineering inspired activities which were run at the 2014 in-school visits with volunteer support from Rio Tinto and UWA engineering students. Details of these activities are listed in the table below.

Mentoring program

Throughout 2014, 13 female Rio Tinto mentors were paired with 13 female UWA engineering students as part of the UWA Women in Engineering program. In addition to receiving support and guidance, the students visited Rio Tinto’s Operations Centre on 18 July 2014 to learn about the business and operations of the centre.

Future initiatives

GiE aims to engage with many more students in 2015 as partnerships will be established with six additional schools. Initiatives and events planned for 2015 include:

- New engineering inspired activities will be developed and delivered to students in Year 7 -10 at all 11 partner schools throughout the year. This will include a challenge based at a mine site, giving students the opportunity to step into 7 different engineering roles
- 440 Female students will be invited onto campus for a Girls in Engineering Day at UWA
- Teachers from all 11 partner schools will be invited on-campus for teacher reference group and networking meetings
- A career counsellor booklet profiling the careers of female Rio Tinto engineers will also be developed and distributed to high schools

<table>
<thead>
<tr>
<th>GiE Engineering Activity</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>What type of engineer could you be?</td>
<td>Students will see that their interests do align to certain types of engineering and that they could be an engineer.</td>
</tr>
<tr>
<td>Share, Share, Trade</td>
<td>Students will be interacting and learning about the different types of engineering. This activity will impart a lot of information in a fun way in a short amount of time.</td>
</tr>
<tr>
<td>Biomimicry – What inspired what?</td>
<td>Students will be problem solving in groups. Students will think about how nature can inspire the development of different engineered products. Students will also learn about the different areas of engineering and the different types of things that engineers in these areas develop.</td>
</tr>
<tr>
<td>Biomimicry – Vegetable plant investigation</td>
<td>Students to work in groups and investigate why some vegetables are clean when grown in dirt while others are dirty. Students will observe that some plant leaves are water repellent and self-cleaning. Students will think about how this self-cleaning property can inspire engineered technology.</td>
</tr>
<tr>
<td>Biomimicry – Design challenge</td>
<td>Students will think about how nature can inspire the development of different engineered products. Students will be problem solving in groups to come up with new/improved products that are inspired by nature.</td>
</tr>
<tr>
<td>How to solve a Rubik’s cube</td>
<td>By solving the Rubik’s cube, students will improve skills such as problem solving, spatial and critical thinking, memorisation, patience and persistence.</td>
</tr>
</tbody>
</table>
School visits

In 2014 the GiE program established partnerships with five schools and engaged with over 280 students in Year 8 -10 through running activities at school visits.

Activity coordinators
A key achievement in 2014 was the recruitment and training of identified Rio Tinto volunteers and female UWA engineering students to help run in-school activities.

Engaging students
A typical school visit involves a presentation to introduce students to engineering and provides a brief overview of the steps required to put students on the right path to study engineering at university. Additionally a female engineer from Rio Tinto will also give a short presentation about their journey to become an engineer and why they think there needs to be more females in engineering.

Volunteers will then run a 1-2 hour interactive engineering activity with students.

The GiE programs current partner schools include:
- The Ballajura Community College
- Belmont City College
- Governor Stirling Senior High School
- La Salle College
- Ellenbrook Secondary College

### Table 1: School and Student Numbers that Participated in GiE In-School Activities

<table>
<thead>
<tr>
<th>School</th>
<th>Date</th>
<th>Male students</th>
<th>Female students</th>
<th>Total students</th>
<th>Year group</th>
<th>Rio Tinto volunteers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ballajura CC</td>
<td>03/09/2014</td>
<td>32</td>
<td>28</td>
<td>60</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Ballajura CC</td>
<td>10/09/2014</td>
<td>32</td>
<td>28</td>
<td>60</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Ballajura CC</td>
<td>15/09/2014</td>
<td>10</td>
<td>15</td>
<td>25</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Belmont CC</td>
<td>15/09/2014</td>
<td>12</td>
<td>15</td>
<td>25</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Governor Stirling SHS</td>
<td>16/10/2014</td>
<td>30</td>
<td>9</td>
<td>39</td>
<td>8/9</td>
<td>3</td>
</tr>
<tr>
<td>La Salle College</td>
<td>30/10/2014</td>
<td>20</td>
<td>12</td>
<td>32</td>
<td>8/9/10</td>
<td>2</td>
</tr>
<tr>
<td>Ellenbrook SC</td>
<td>04/12/2014</td>
<td>20</td>
<td>20</td>
<td>40</td>
<td>8/9/10</td>
<td>2</td>
</tr>
</tbody>
</table>
Girls in Engineering 2014 in-school activities overview

After participating in the GiE in-school Biomimicry activities students were surveyed on whether they would consider studying engineering at university.

- 81% of the female students said they would go to university after high school
- 38% female students said they would consider studying engineering at university (Figure 1). Out of these students 42% said they were very inspired by the GiE activities to study engineering, 42% were inspired and 16% were a little inspired by the GiE activities to study engineering (Figure 1)

Would you consider studying engineering at university?
- How much has the GiE activities inspired you to be an engineer?

![Graph showing percentage of female Year 8, 9, and 10 students who would consider studying engineering at university. Students that answered yes were asked how much the GiE activities inspired them to be an engineer.]

Some feedback from the students after the in-school activities included:

- “It has made me question how things work and how to make them better. It has also made me consider engineering as a career”
- “It taught me what engineers do and kind of inspired me to become an engineer”
- “I am now actually very inspired to do engineering”
What do you think an Engineer does? Based on today’s session, what do you think an engineer does?

<table>
<thead>
<tr>
<th>What do you think an Engineer does?</th>
<th>Based on today’s session, what do you think an engineer does?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard math, build bridges and other architecture, mining things.</td>
<td>Design solutions to solve problems.</td>
</tr>
<tr>
<td>I think an engineer does complicated math.</td>
<td>Someone who designs solutions to solve problems.</td>
</tr>
<tr>
<td>They design and engineer stuff.</td>
<td>An engineer designs solutions to problems.</td>
</tr>
<tr>
<td>They engineer and design things.</td>
<td>Based on today’s session I would say that an engineer creates things that make life easier and solve problems throughout the world.</td>
</tr>
<tr>
<td>They create new inventions and fix things.</td>
<td>Creates new inventions to make things easier (designing solutions).</td>
</tr>
<tr>
<td>Intense mathematics and making things.</td>
<td>They solve problems.</td>
</tr>
<tr>
<td>They can create stuff, fix things.</td>
<td>They design solutions to solve problems.</td>
</tr>
<tr>
<td>An engineer does engineering.</td>
<td>Creates solutions to ideas.</td>
</tr>
<tr>
<td>An engineer plans infrastructure and organises how buildings and machinery are being built.</td>
<td>They solve problems and use nature as an inspiration to help solve these problems.</td>
</tr>
<tr>
<td>A person that works in developing equipment to change how the world works or keep it running.</td>
<td>Someone that uses their knowledge to solve problems in daily life.</td>
</tr>
<tr>
<td>Making or fixing things.</td>
<td>An engineer solves problems in today’s society so the world will be more efficient.</td>
</tr>
</tbody>
</table>
On-campus activities

The Girls in Engineering program was launched on Tuesday 18 November 2014. Over 150 guests attended the formal launch of the program at The University Club Banquet Hall.

Following the formal proceedings 75 female students, from the five GiE schools, participated in three engineering inspired activities at UWA. The girls rotated through three different activities which included:

- A tour of the Faculty of Engineering, Computing and Mathematics laboratories (The Glider lab which showcased UWA’s autonomous underwater vehicles, the Swan River Model which is a scaled version of Perth’s Swan River and demonstrates how salt water first flowed into the river and the effects this had on its ecology and The Wind Tunnel which does experimental tests of wind speeds on structures such as skyscraper buildings)

- ‘How to solve a Rubik’s cube’, which teaches problem solving, patience and persistence and helps develop spatial visualisation and memory

- Photovoltaics module, which is about renewable energy and solar power run by UWA’s Engineers Without Boarders (EWB) student club

The activities were designed to introduce the students to the different areas of engineering and to excite them about a possible career in engineering.

It was also an excellent opportunity for the students to experience the university campus and meet current female engineering students and professional engineers.

The favourite activity of the day was ‘How to solve a Rubik’s cube’, with 66% of the students saying this was the activity they enjoyed the most. 18% of the girls enjoyed the EWB activity the most while 16% enjoyed the Faculty tour the most.

Some comments from the day included:

“It’s a really good program that will influence more girls into engineering, you got me!”

“I loved learning about what different engineers do”

“It was a great interactive day and made me think more about becoming an engineer”

“I’m seriously considering engineering as a career now”

“A wonderful project that expands my knowledge and possibilities”
The University of Western Australia’s Girls in Engineering (GiE) program is proudly supported by:

RioTinto

Faculty of Engineering, Computing and Mathematics
The University of Western Australia
M017, 35 Stirling Highway
Crawley WA 6009
Tel: +61 8 6488 3061
Email: enquiries-ecm@uwa.edu.au
www.ecm.uwa.edu.au

Aspire UWA
First Floor, Social Sciences Building (South Wing)
The University of Western Australia
Crawley WA 6009
Tel: +61 8 6488 1538
Email: aspire@uwa.edu.au