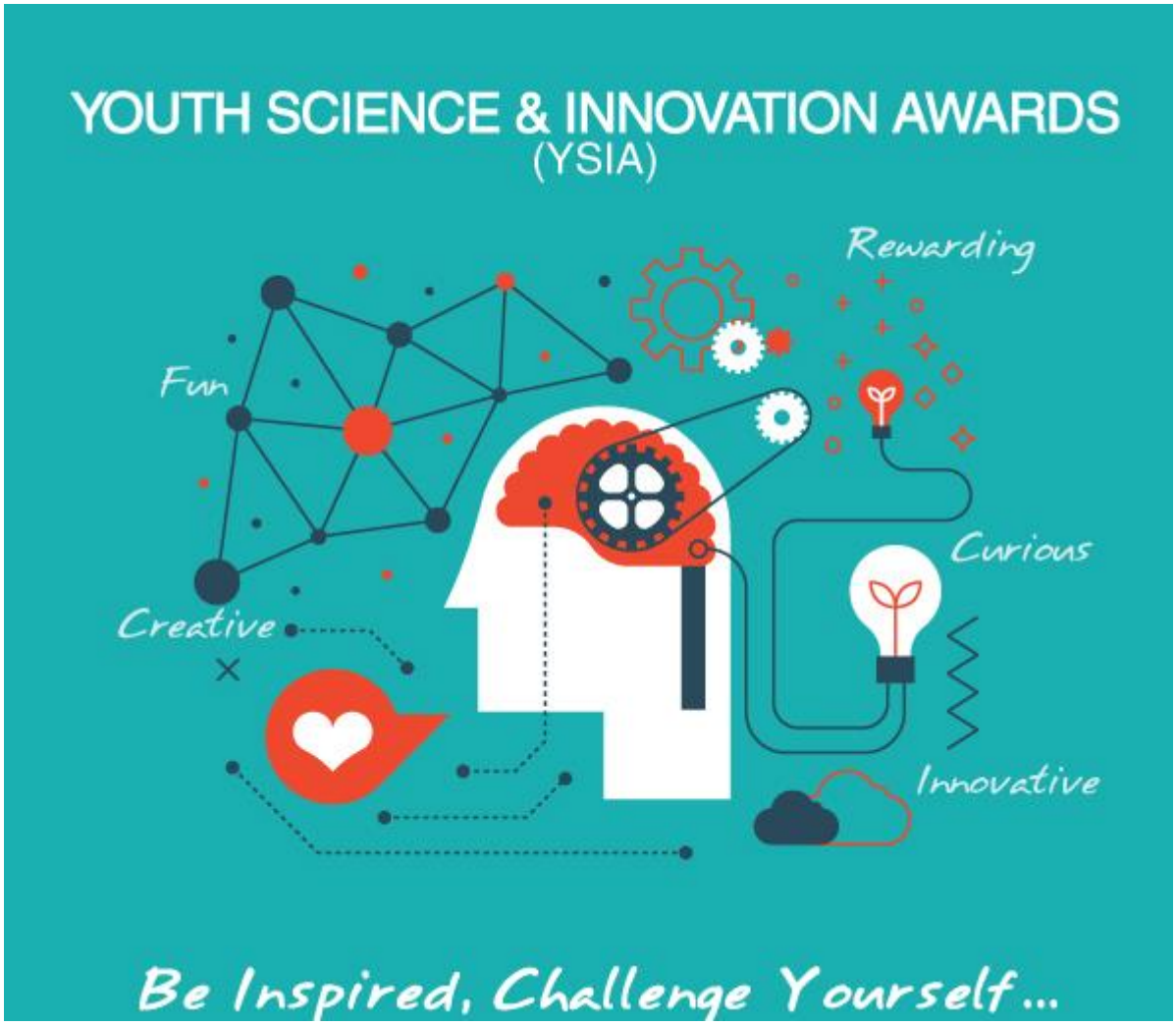

Student Information Booklet

2017

ROCKET

STEM

Rotary Club of Ku-ring-gai

Message from Rotary Club of Ku-ring-gai

A deep-rooted duty of care has consistently been practised by Rotary and its members since its inception. A critical philosophy governing the passion and activities of the Rotarians is that no humanitarian act is insignificant – civic duty performed within a local to international scope has the potential to have an international and local impact, respectively. Amongst all the programmes run by Rotary clubs, youth activities have always been present for we acknowledge that investment in the development and education of our youth is paramount in ensuring youth welfare and employment. And that's the space the Rotary Club of Ku-ring-gai would like to contribute through this programme.

Science, Technology, Engineering and Mathematics (STEM) are playing an ever more influential and vital role in our society and economic development. Every sector from health to business are demanding employees inept at those skills due to the role of robotics, computers and software engineering becoming ever more embedded in every professional field. With the IT revolution progressing at full speed ahead, it is more important than ever that our Youth are trained and equipped with such vital STEM skills from early on to ensure that they are not left behind in the future.

Through this programme, we are hoping that our youth are encouraged to immerse and familiarise themselves with the world of STEM and all the skills and applications it has to offer. By facilitating such exercise within a framework of a competition, the participants can utilise and lean important technical and life skills while carrying out research, asking questions, exercising critical thinking, collaborating and innovating.

We, the Rotary Club of Ku-ring-gai, hope that this programme will provide a fun space for our youth to be curious, learn important skills and eventually, be passionate and driven throughout their journey through vocational or tertiary education and future careers.

A short introduction to YSIA

Having first proposed within the four corners of a quite café in Gordon, YSIA was incepted in an effort to address science education in our community. Through the competition, we would like to provide an alternative space for students to explore and follow their scientific curiousities outside the confines of the classroom.

This programme aims not only to be a competition, but also a mentoring and networking hub for high school students to connect with other students and high-achieving university mentors. Through such connection, we hope that they will be able to exchange ideas, help and learn from each other facilitated through the motivation to complete their chosen science or engineering project.

By undertaking their project, the students will be able to use it for submission to the more prestigious state and national science competitions in Australia. These include the CSIRO CREST, YoungScientists (by Science Teachers' Association NSW) and the highly-acclaimed BHP Billiton Science and Engineering Awards. Submission to and taking part in these programmes provides a great platform to push their ideas to a wider community as well as meeting with other students from all walks of life.

So what would the role of YSIA be? It will provide you with the help required to undertake your projects, especially if your school does not have the necessary resources to help with the competitions. Furthermore, aside from being encouraged to submit to the major competitions, we would also like to recognise excellence in your projects locally via the YSIA. Hence, through YSIA, students will be empowered with:

- Useful information and support for engagement with science opportunities, internships and popular Science competitions
- Face-to-face mentoring by high achievement university science students to enhance the technical skills and presentation techniques
- Connection with other like-minded students in building a network and knowledge sharing
- A chance to win impressive awards and prizes.

Here are some key dates to look out for:

- 25th Feb – ROCKET Café
- May – YSIA Workshop (check on progress, presentation and report writing skills)
- August – Presentation & Awards Night

In the first session – ROCKET café, students will be introduced to the programme and have the opportunity to ask questions and register. In the second workshop, students have the chance to discuss their progress with the mentors and receive help and advice. They will also be taught useful skills such as presentation and report writing to help them with the submission of their project. Finally, during the presentation night, they will have the chance to give a short presentation on their project with the final judgements made and awards given.

So are you up for it?

Registration is FREE and simple … just head to our website!

Categories

YISA is accepting submissions in the following categories:

- Investigative research
- Engineering & technological innovation
- Scientific photography

An outline of what is expected of the projects in each category is shown below:

Investigative research

(physics, biology, chemistry, environmental science)

This category is all about **DISCOVERY**. Think of Einstein's Theory of Relativity, Maxwell's Theory of Electromagnetism, Galileo's study of planetary motion, Marie Curie's discovery of Radiation, Watson-Crick-Franklin's structure of DNA, Pasteur's Theory of Germs and Disease etc. You're out there to ask questions, observe, experiment and divulge the mysteries of the universe.

- Choose your own topic or question and propose a hypothesis based on information from previous studies
- Perform a risk assessment
- Come up with innovative and creative approaches and methodology to investigate your hypothesis
- Pursue valid experimental planning and data analysis for obtaining and evaluating your results
- Make sure to record all your plans and collected data
- Entertain the significance of answering the question or your findings and propose some applications
- Communicate your findings to a general audience

Engineering & technological innovation

(robotics, App development, Web-based programme etc.)

This category is all about **INVENTION**. So go wild with your imagination and use your creativity and critical thinking and analysis to come up with a solution to a problem. Think of Thomas Edison, Leonardo Da Vinci, Wright Brothers, the WiFi, Alexander Graham Bell etc.

- Identify a problem, investigate solutions
- Design and build, with aid from background research
- Identified a need that lead to significant improvement
- Assess its usability – safety, reliability, convenience, well-chosen technologies and materials
- Identify shortcomings or points of future improvement

Supplementary category

Scientific photography

This category can be taken in conjunction with the two main categories. This is aimed at encouraging participants to observe the wonders of our natural world as well as the technological advances constantly shaping our societies.

For more information, feel free to consult CSIRO CREST and Young Scientists website.

YoungScientist – Technology category

http://www.youngscientist.com.au/wp-content/uploads/2015/05/10-12-IIATE-Models-and-Innovations.pdf

YoungScientist – Scientific investigation category

http://www.youngscientist.com.au/wp-content/uploads/2015/05/10-12-Scientific-Investigation.pdf

CSIRO CREST

http://www.csiro.au/en/Education/Programs/CREST/Advanced-CREST

Entry & Submission Guidelines

The following table outlines the submission criteria for each category:

Investigative research	***REPORT*** Max 2000 words (excl. titles, figure explanations and data figures/tables) Example outline: Introduction, aim & hypothesis, results, discussion, results, references (MUST contain references, if any used) Submit via email to info@kuringgairotary.org.au Heading should contain: 'YSIA Investigation submission – YOUR NAME'
Engineering & technological innovation	***REPORT*** or ***VIDEO/POSTER*** Same guidelines as Investigative Research for report submission Max 5 minutes video Recommended to post the video on YouTube Submit YouTube link/video file (AVI, MOV, WMV, MPEG) to info@kuringgairotary.org.au Heading should contain: 'YSIA Technology submission – YOUR NAME'
Scientific photography	Max 3 images (Format: JPEG, TIFF, PNG) Each image should be accompanied with a: • title (no longer than 10 words) • short caption (no more than 100 words). Submit via email to info@kuringgairotary.org.au Heading should contain: 'YSIA Photo submission – YOUR NAME'

The **DEADLINE** for the submissions is the **last day of July**. After submission, a panel of judges consisting of Rotarians, science teachers and university students will evaluate and select the projects to be awarded or recognised as satisfactory. At the Presentation & Awards Night, the awards will be handed out after short presentations from a select few chosen and notified by the judges based on the quality of their projects. The Presentation & Awards Night will occur in August, with the exact date confirmed later via email.

Awards Guidelines

Best Science	Participant has excelled at all/most avenues of investigation incl. background research, hypothesis, methodology, results, discussion, significance, application, report and communication to a general audience through an oral presentation.
Best Invention	Participant has excelled at all/most avenues of technological and engineering innovation incl. background research, problem identification & proposed solution, design, build, usability & testing, significance, application and communication of the design to a general audience through an oral presentation.
Best application	Participant has identified and justified that the significance of her/his scientific discovery OR invention is capable of bringing about a huge impact socially, environmentally, economically and/or technologically.
Humanitarian award	Participant's discovery OR invention is capable of making a significant impact in alleviating human and social problems and improve their conditions. This award is created in line with Rotary's Humanitarian mission.
Certificate of participation	All participants satisfying the rules and minimum criteria (pages 9-11) will have their contribution recognised by this award.

Rules

We want the project to be very easy for you to get started with, but of course, there are some rules for the competition and we're setting them out below:

(I) the work that you submit MUST fit into one of the following categories —

- Investigative science and research
- Innovation, technology and engineering

with the following awards presented to recognise your excellence in the said areas –

- Best All-round award
- Best application
- Best design and innovation
- Humanitarian award

All participants will receive participation certificates upon the satisfactory executing and completion of their project.

(II) BE CAREFUL! If you use any laboratory equipment, tools or electrical items please do so under the supervision of somebody who is competent and with their permission. Failure to do so may cause harm and lead to disqualification for the awards.

(III) This is a chance to display your ideas. So, don't copy something that has already been completed and submit as your own. Of course, we encourage you to seek advice from parents, friends, teachers, libraries and the on Internet. It is also quite okay to take something that already exists and improve on it. The magic ingredient in your project is what you contribute. For any background information, make sure to cite and acknowledge the contribution from the others.

(IV) you can enter the competition on your own or as part of a team. To keep things simple, we are limiting teams to no more than three people. (If a team gets too large, too much

time might be taken up trying to manage all the arrangements between team members rather than getting on with the project.)

(V) if you enter a project, it will be assessed by our judging panel and their judgement will be final.

(VI) you are encouraged to participate in other competitions with this program helping you do well in them. To recognise your local contribution from your work for the state-wide competitions, we will present some local awards in the said categories. So you can still attend our mentoring session in May to get advice in relation to that other competition.

YSIA rules very closely mirror those of STANSW Young Scientists and CSIRO CREST to prepare the participants for submission to those competitions. For more details, please refer to their website.

STANSW Young Scientists – Rules

http://www.youngscientist.com.au/?page_id=333

CSIRO CREST

http://www.csiro.au/en/Education/Programs/CREST/Advanced-CREST

BHP Billiton Science and Engineering Awards

http://www.scienceawards.org.au/

Marking Rubric

It is quite hard and futile to come up with a marking guideline to evaluate the quality of your project due to the highly versatile and specialised nature of each unique branch of science and innovation. Hence, we won't be judging your work based on its topic and the results or solutions. We strive to evaluate your work based on the level of the background research behind it, the reasoning behind your project plan or design, the interpretation of your results, viability of your invention and how well you present it to a wider audience. In other words, this marking rubric should be used to see what is expected of you from the competition, however, there are no weighting placed upon the type and the topic of your research provided that all rules are met.

For this programme, the marking rubric followed reflects those used in the Young Scientists competition. A benefit of this arrangement is that your project will meet the requirements for the competition, making the process of submission smoother.

STANSW Young Scientists – all marking rubrics
**use this page to find the marking rubric corresponding to your high school level*

http://www.youngscientist.com.au/?page_id=665

Some example rubrics from the above link:

STANSW Young Scientists – Yr10-12 Investigative Research marking rubrics

http://www.youngscientist.com.au/wp-content/uploads/2015/05/10-12-STANSW-Scientific-Investigation-1.pdf

STANSW Young Scientists – Yr10-12 Technology marking rubrics

http://www.youngscientist.com.au/wp-content/uploads/2015/05/10-12-IIATE-Models-and-Innovations-1.pdf

Project ideas

We understand that the hardest step is to decide where to start! But not all science and innovation has come out of nothing. Many discoveries and inventions are based on lots of preceding work done by other research and innovators. So to get you started and help plant some ideas in you, we recommend having a look at the following sources:

CSIRO CREST

http://www.csiro.au/en/Education/Programs/CREST/Advanced-CREST

Julian's Science Fair

http://www.juliantrubin.com/sciencefairprojectsaz.html

Young Scientists Past Winning projects

http://www.youngscientist.com.au/?page_id=1885

STANSW Young Scientist Video Collection (YouTube)

https://www.youtube.com/channel/UCFTpxQ5IMedGMRsU8W9QDfw/videos?shelf_id=0&view=0&sort=dd

BHP Billiton Science and Engineering Awards

http://www.scienceawards.org.au/

Us scientists and engineers do not always come up with an idea from the beginning of the work. Often, great ideas come later on after seemingly pointless wandering in the world of knowledge, whether it be though the internet, journals, news articles, textbooks, documentaries etc. So if you don't have an idea from the beginning, don't worry! Have a look around the mentioned resources and an idea might cross your mind. The point is to make sure to always have a curious mind.

Contact

Linda Lam-Rohlfs

ROCKET & YSIA coordinator

Email info@kuringgairotary.org.au

Phone 0408 469 137

Web http://www.kuringgairotary.org.au/index.php/home2/rocket-program

(includes the link for registration)

Location Gordon library, Youth Centre (meeting room 2)

799 Pacific Highway, Gordon, NSW 2072

Facebook https://www.facebook.com/rocketprogram

Mahiar Mahjoub

YSIA Mentor

B Science (Adv) (Hons I) (Sydney Uni)

Email mmah2050@uni.sydney.edu.au