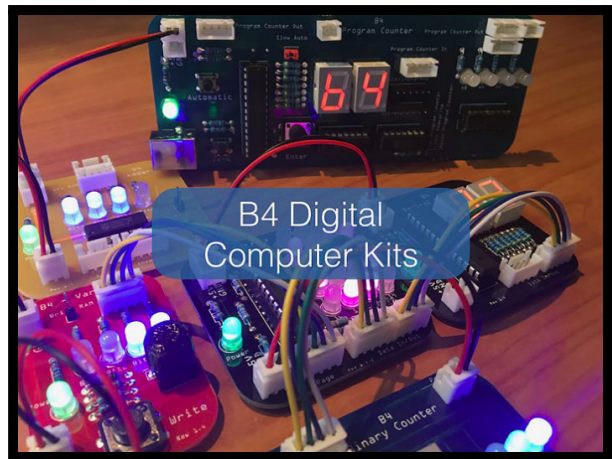


# Galen Parents Association Funding Application Integrated Studies 2020 - Support for Year 7 & 8 STEM Units of Study. VEX Robotics & B4 Computing



**Submission by:** Maree Timms & Brett Webber

*Total Funding Required: \$25,614*

*Asking support by GPA for \$12,807 ( 50% of total funding required)*

**Submission Supported by Leadership.**

# Galen Parents Association - Funding Application

## Integrated Studies 2020 - Support for Year 7 & 8 STEM Units of Study.

### Introduction:

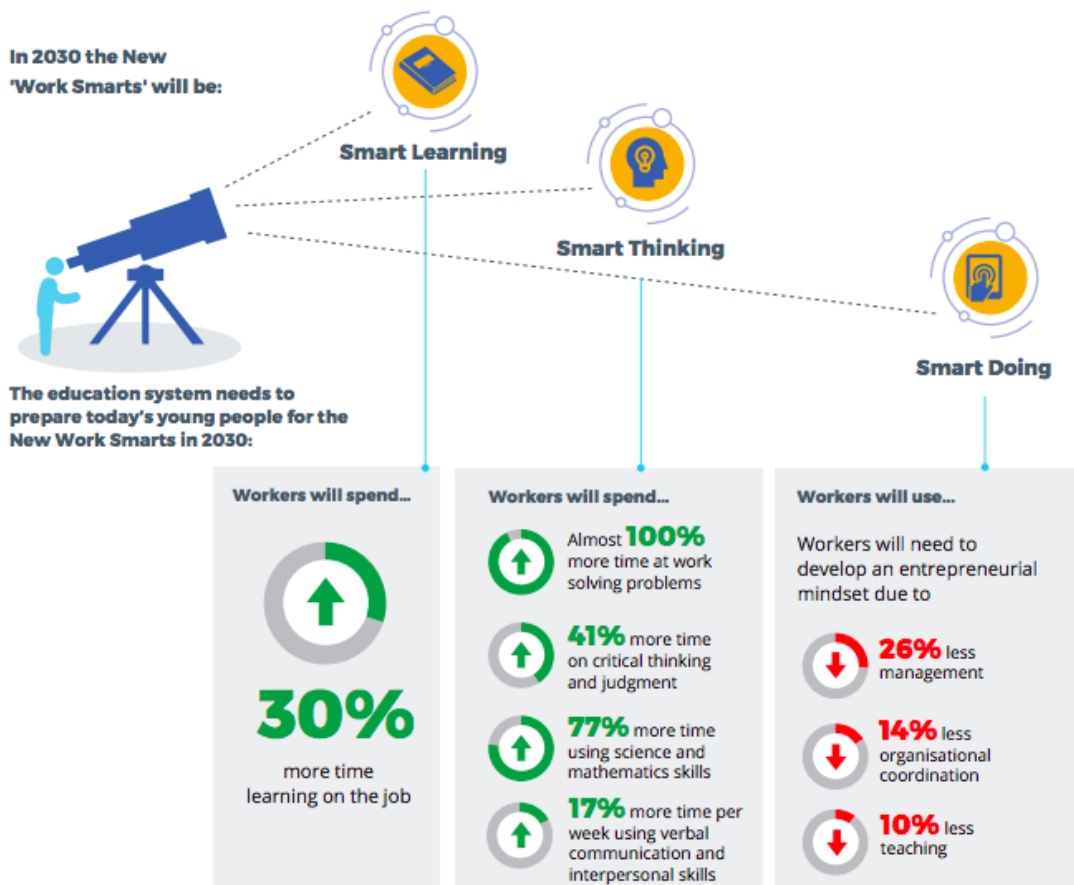
STEM Skills/learning has become a very important “catch phrase” for education over the last few years, but what is STEM? When we talk of STEM most people understand the acronym of the solo subjects of Science, Technology, Engineering and Maths, however, the true power of STEM Learning is when it is delivered in an integrated program allowing students to work collaboratively, incorporating design thinking, communication skills plus many more valuable skills. In a world that is moving so fast, we have transitioned from 21st century skills, and are now looking at **“The New Work Smarts Skills” for the 4th Industrial Revolution.**

Coined by Klaus Schwab, founder and executive chairman of the Geneva-based World Economic Forum: **“The Fourth Industrial Revolution** refers to how technologies like artificial intelligence, autonomous vehicles and the “Internet of Things: IoT” are merging with humans’ physical lives.”

According to [Jan Owen AM](#), CEO and founder of the Foundation for Young Australians and their report: [New Work Order report series](#)

**“The New Works Smarts:** By 2030, automation, globalisation and flexibility will change what we do in every job. We urgently need to prepare young people with the work smart skills they will need most.”

### The change in work means young people will need to be equipped with the New Work Smarts



We are fortunate that Galen Catholic College has been a leader in Integrated Learning and STEM learning, in our region.

Integrated learning has been in Galen in various forms over a number of years, SENIT (Yr 7), Discovery(Yr 9). These have been successful programs, but as educators, we are all conscious of the need to constantly evaluate and develop learning experiences for our students that remain at the cutting edge of best practice.

In 2019, we saw the successful implementation of the Year 9 Integrated Studies units, which has included the STEM unit: Flying Futures - Drones. Drones may be considered “toys”, however the drone industry is thriving, with drones being used in agriculture, disaster relief, search and rescue, research, defense, photography/film, just to name a few.

Galen has also led the way not only locally but nationally with the extremely successful and Award winning, extra-curricula VEX robotics program.

Galen has had much publicity in the Wangaratta Chronicle and beyond due to the implementation of these programs. We wish to continue leading the pack and creating a future for our students and community allowing them to thrive in the fast paced future world of work. We want them to have the skills to create their future and be better equipped to benefit from a connected world.

## **Our Project: Integrated Studies 2020 and beyond - Year 7, 8 and 9.**

In 2020 Galen will be implementing integrated units of study for Years 7 and 8, this will mean all students from years 7 - 9 will have opportunities to learn through 9-week units of study that will enhance their overall learning at Galen, engaging them in a wide variety of learning opportunities, through a range of integrated subject areas.

		<b>Year 7</b>	<b>Year 8</b>	<b>Year 9</b>
<i>STEM thread</i>	Science, Technology, Engineering, Maths	VEX Robotics	B4 Computing	Flying Futures
<i>Humanities, Languages thread</i>	Languages (Italian & Indigenous), History, Geography	CLIL – Ancient Rome	Indigenous Language & Culture	Ancestry & Achievement
<i>Personal Development thread</i>	Science, Health, Outdoor Education, Visual Arts	Brainology	Global Health	ReWild
<i>Maths, Science, Geography, PE</i>	Maths, PE, Science, Geography, Sustainability	Mathletics	Citizen Science	Seeds of Change

**We are looking for Galen Parents Association's support for the  
new Year 7 and 8 STEM Units of study**

**Year 7 VEX Robotics:**

Due to the success of the extra curricula Galen VEX Robotics Program, Galen has seen students thrive in this environment, not only locally and Nationally but also on the World Stage, proudly representing Australia at the 2018 and 2019 VEX World Championships.

This success has brought a number of new enrolments to Galen. However due to the nature of the extra-curricula program, it does not have the capacity or funding to expand beyond 5 teams (25-30 students).

Offering this exciting program as a 9 week unit for **every year 7 student** will enable year 7 students to gain valuable insights into VEX robotics and a whole range of STEM skills: the engineering design process, programming (both driver controlled and autonomous), and developing and refining their technical verbal and written communication skills. They will be problem-solving, troubleshooting, learning to work within constraints, identifying multiple solutions to problems, and finding the best possible solution through iteration.

Parents and students who have been eager to enrol at Galen due to our VEX robotics program will be able to participate and gain a taster to the world of VEX Robotics. ***Robotics is not only the future, but it is also the present.***

**Year 8 B4 Computing:**

We all know about computers, but how do they work? The B4 Computing unit is a hands on unit that gives students an insight into how the basic "brain" of the computer works. [B4-handbook](#).

*"The B4's design goes back to the time in the 1970's when early digital computers emerged. It follows similar design principles as some of the famous classic computers, such as the Apple I, the Altair 8800, or the Z-80. These principles are still valid today in modern computers, smartphones and tablets. The B4 illustrates these principles and combines them with modern 21st century Arduino technology to let students, parents and teachers explore the magic of making a computer without needing a university degree."*

Students will work with a B4 kit that contains all the necessary equipment and a handbook that is heavily linked to the Digital Technologies curriculum. Students will work through a range of activities through which they will gain an understanding of how a basic computer functions. They will be able to understand the background to coding, binary numbers and logical thinking. The B4 process and kit is compatible with the Arduino range of products, which allows students to extend their knowledge at home.

Each Year 8 student will learn new digital technology skills and develop and understanding which incorporates a mathematical and logical way of thinking and problem solving.

## Who will benefit from these new Integrated STEM Units of Study:

Every student in Year 7 and 8 will benefit from these new units of study in 2020 and beyond. The knowledge that they will gain in these units will see them move into the senior area of the school with a broader depth of knowledge and skills in STEM and digital technologies fields.

Year 7 2020	9 classes x 25 students = 225
Year 8 2020	9 classes x 26 students = 234

In 2020, over 800 students will be gaining STEM and Digital Technologies skills, if we include the Year 9 Flying Futures (Drones) unit of study.

## How will this benefit the learning opportunities for students.

We will be delivering these courses to ensure our Galen students continue to broaden their knowledge and in preparation for the future world of work.

It has been reported in educational research from both [Edutopia](#) and the [Lucas Education Research Foundation](#) that Integrated Studies:

- enhances motivation
- improves problem-solving skills,
- deepens content knowledge,
- makes connections across subjects,
- increases overall academic achievement.

STEM skills/learning as mentioned in our introduction, is also a highly sought after skill set in the current and evolving workplace. To have the combination of integrated STEM units from year 7 to 9 will ensure our students are better equipped to transition from school into the workforce and/or further study.

We cannot predict the future, but we can prepare our students as best we can, Galen believes the integrated units will assist students in gaining skills needed to thrive in the ever changing world of work.

*“The Fourth Industrial Revolution, which includes developments in previously disjointed fields such as artificial intelligence and machine-learning, robotics, nanotechnology, 3-D printing, and genetics and biotechnology, will cause widespread disruption not only to business models but also to labour markets over the next five years, with enormous change predicted in the skill sets needed to thrive in the new landscape.” - [World Economic Forum - The Future of Jobs](#) ( 2016)*

## Is this inline with the current curriculum or strategic plan?

The integrated study of STEM units not only follows the Victorian F-10 curriculum and educational best practice, but complements the ethos and vision of Galen Catholic College

*“We endeavour to turn out young men and women who are well-equipped to cope with the demands of today’s rapidly changing technological society and who have a sound value system on which to base their future lives.”* Taken from the Galen Ethos

*“Provide quality education that challenges, supports and empowers students to explore and reach for their full potential.”* Taken from the Galen Identity and Vision Statements

## This application has the support of the area/subject coordinators as well as the leadership team.

Teachers were asked to submit ideas for 2020 Integrated units to leadership. Each unit that was submitted was assessed by Leadership. Those that were successful were endorsed and supported by them. Both the Year 7 VEX unit and the Year 8 B4-computing unit were successful submissions, thus we have full support of Leadership to run these integrated units.

It is also worth knowing that Brett and Maree will not be team teaching these units. Brett will be teaching the VEX Unit, with another staff member. Maree will be teaching the B4 Computing unit with another teacher. This is to ensure there is capacity development of other teachers in each of the units.

## Funding and Support for the two new STEM Integrated Units of study

Below is the initial costs required to set up each unit of study.

There will be small ongoing costs in future years to cover repairs and maintenance, which the school will cover.

STEM Unit	Equipment required	Total Cost	Funding support by school (50%)	Funding being asked for by Galen Parents Association ( 50%)
Year 7 VEX unit	28 x VET IQ kits, plus 3 x VEX Fields, game elements and spare batteries	<b>\$17,538</b>	\$8,769	\$8,769
Year 8 B4 Computing Unit	30 x B4 computing kits	<b>\$8,076</b>	\$4,038	\$4,038
	<b>TOTAL</b>	<b>\$25, 614</b>	<b>\$12,807</b>	<b>\$12,807</b>

Thank you for considering this application, we hope to gain your support for this initiative.

**Maree Timms**

B4 Computing Lead Teacher  
Unit designer

**Brett Webber**

VEX Robotics Lead Teacher  
Unit Designer

***This submission is supported by:***

**Kylie Girolami**

Acting Professional Learning Leader

**Daniel Armitage**

Acting Deputy Principal - Learning & Teaching

**Dale Gleeson**

Acting Principal

**Emily Horden**

Business Manager

***FIND ATTACHED THE FOLLOWING DOCUMENTS:***

- 1. Itemised costing of the VEX Robotics equipment*
- 2. Itemised costing of the B4 - Computing equipment*
- 3. Chronicle article on Integrated Learning*
- 4. Chronicle article in VEX Robotics at Australian Nationals*
- 5. Chronicle article in VEX Robotics preparations for VEX Worlds*

# Attachment 1 : Itemised costing of the VEX Equipment



Innovation First Trading SARL  
 C/O Global Discovery  
 16 Waddikee Road Lonsdale, SA 5160  
 Email: auinfo@innovationfirst.com  
 ABN: 58 923 871 803

Phone: 08 8326 5500  
 Fax: 08 8326 1888

Page: 1 of 2

## Sales Order Acknowledgement

**Sales Order: 859785**

<b>Sold To:</b>  Galen Catholic College College St Wangaratta VIC 3677  <b>Email:</b> brett.webber@galen.vic.e	<b>Ship To:</b>  Brett Webber Galen Catholic College College St Wangaratta VIC 3677  <b>Email:</b> brett.webber@galen.vic.e <b>Phone:</b> 03 5721
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Order Date: 07/08/2019	PO Number: email8/8/19	FOB: Our Dock
Need By: 07/08/2019	Sales Person: Nicole Champagne	
Terms: Net 30	Ship Via: Custom	

*AUD Dollar*

Line	Part Number/Description	Order Qty	Unit Price	Ext. Price
1	228-5200 Super Kit (ANZ)	28.00 EACH	533.00	14,924.00
2	228-2550 Sales Kit VEX IQ Challenge Full Field Perimeter & Tiles	3.00 EACH	340.00	1,020.00
-----Kit Components-----				
Kit Seq.	Part Number/Description	Qty. Per Parent		
2.001	228-3051 VEX IQ Challenge Half Field	2.00 EACH		

Line Total:	15,944.00
Line Miscellaneous Charges:	0.00
Order Miscellaneous Charges:	0.00
GST Tax:	1,594.40
<b>Order Total</b>	<b>\$ 17,538.40</b>

OrderAck:001:00 -----



## Attachment 2 : Itemised costing of the B4 - Computing equipment

### Digital Technologies Institute PTY LTD

20 Takora St.  
Middle Park Qld. 4074  
Australia  
Phone: +61402277157  
enquiries@digital-  
technologies.institute  
[https://www.digital-  
technologies.institute](https://www.digital-<br/>technologies.institute)  
ABN: 99 614 504 264

Digital  
Technologies  
Institute

Quote: 20190729

Quote

Quote date: 29/07/2019

Galen Catholic College  
188 - 244 Phillipson St  
Wangaratta VIC 3677  
Australia

Expiry:  
28/08/2019

ITEM	DESCRIPTION		UNITS	UNIT PRICE (ex GST)	TAX TYPE	AMOUNT (ex GST)
B4-BK-1-4	B4 Computer Processor Kit	Qty	30	244.73	GST	7,341.90
B4-Free- Shipping	Free Shipping	Qty	1	0.00	GST	0.00
B4-Teacher- PD	1h of online teacher PD	Hrs	2	0.00	GST	0.00
Sub-Total (ex GST):						\$7,341.90
GST:						\$734.19
<b>TOTAL (inc GST):</b>						<b>\$8,076.09</b>

#### Notes

No printed handbooks (saving of \$10/kit). Electronic handbooks can be downloaded for free at: <https://www.digital-technologies.institute/handbooks>

# George Lucas research helping Galen students



BY SIMONE  
KERWIN  
skerwin@  
nemedi.com.au

IT may not be drawn from a galaxy far, far away, but Galen Catholic College students are benefiting from the research of Star Wars creator George Lucas in their new-look integrated studies program.

The Wangaratta school has drawn on the work of Edutopia, part of Lucas' educational foundation, in developing its program for year nine students.

And already there are plans to extend the program to year seven and eight students in 2020.

Edutopia and Lucas Education Research, part of the George Lucas Educational Foundation, have recognised through their work that integrated studies (combining multiple academic subjects in one course of study) enhances motivation, improves problem-solving skills, deepens content knowledge, makes connections across subjects, and increases overall academic achievement.

Used widely in secondary schools around Australia and the world, the concept has been found to be highly effective, and aims to better prepare students to transition from school into the workforce or further study.

At Galen, the program (previously called Discovery) involves students undertaking one of four units each term - working with drones in Flying Futures (integrating science, maths and information technology); creating a family tree and autobiography, and researching notable Australians in Ancestry and Achievement (history and English); learning about the food system in Seeds of Change (geography, science, food technology and agriculture); and learning more about themselves in ReWild (visual arts, outdoor education, health and personal development).

Integrated studies leader Kylie Girolami said year nine was in many ways a 'rite of passage', as students moved from childhood towards young adulthood, so was the ideal stage to provide them with such a platter of experiences as they looked towards their senior secondary school years.



**FOLLOWING THE FOOD CHAIN:** Millie Quin, Sam Maher and Liam Simonetti learn how to keep chickens at Beechworth during their Seeds of Change unit.



**LOOKING BACK THROUGH HISTORY:** Alice Paccagnan (right) as Nancy Bird at Night of the Notables, part of the Ancestry and Achievement unit.



According to Edutopia, integrated learning is a must; it's a worldwide phenomenon, and by aligning with this, we can declare ourselves as leaders in education.

- Teacher Kylie Girolami

She said Galen's alignment with the work of the George Lucas Educational Foundation proved that the approach made sense, as it drew on extensive research into the most effective methods of teaching and learning.

"According to Edutopia, integrated learning is a must; it's a worldwide phenomenon, and by aligning with this, we can declare ourselves as leaders in education," Mrs Girolami said.

She said programs like integrated studies encouraged students to operate just outside their comfort zone, and developed their resilience and self-belief.

Mrs Girolami said integrated studies offered a unique opportunity to assess students in a different way, and to place importance on personal attributes, as well as skills and knowledge.

While performance-based capabilities such as critical thinking, creativity, teamwork, community

engagement, values and ethics, problem solving, organisation, independence, self-confidence, passion for learning and belief in the ability to succeed can be difficult to assess, Mrs Girolami said they were usually those on which teachers, tertiary educators and employers placed most value.

Among the students enjoying the revamped year nine integrated studies program in 2019 are Olivia McConchie, Lily Direen, Mietta Habets and Brodie Watson, who have been involved in the Seeds of Change unit, and Xavier McKenzie, who has been working in ReWild.

Mietta said the program had extended her view of agriculture and food development, with students being given the chance to visit food enterprises in Beechworth and Yarrawonga as part of their studies.

Lily agreed: "It's been great to go out and experience things."

Brodie said it had already had a direct effect at home: "We used to buy all our food from the supermarket, but Mum is now buying a box of food from a local supplier.

"It's also an opportunity to make Galen more sustainable through our projects, including starting a chicken house, and to educate the wider Galen community."

"It's been really interesting to learn about food miles, and to have the chance to discover our own region," Olivia said.

Xavier said he had enjoyed the way the program incorporated information and skills students felt they would use in the future, and shifted them out of their comfort zones to tackle challenges.

Mrs Girolami said it was pleasing to hear positive responses from the students.

"We want kids to love the program, because if there is passion and enjoyment, learning follows on," she said.

# Attachment 4: Chronicle article on VEX Robotics Success

■ Galen excels at Australian Robotics Championships with seven awards and they're...

## Off to VEX worlds again

GALEN Catholic College will be represented at the VEX Robotics World Championships in the USA again next year, after a team of junior students took out a national title on the weekend.

Along with the place at next April's worlds in Kentucky (USA), Galen brought home seven awards from the VEX Australian National Championships, which ran from Friday to Sunday in Melbourne.

Day one of Galen's campaign did not go to plan, with the junior team discovering after checking in that its robot was oversized.

But after overcoming initial panic, the team ensured its robot was modified and legal, and eventually had its robot ready for the field and performing better than it had been previously.

"It was amazing seeing them work as a team to get back into the game," teacher Maree Timms said.

Teacher Brett Webber agreed: "It was a great display of resilience and problem solving, embodying everything that VEX is about."

After competing throughout the weekend, the Galen teams won the VEX IQ excellence award, for top



**THAT WINNING FEELING:** Galen College's successful VEX crew, (back) Maree Timms, Mitchell Currie Fraser, Hunter Richardson, Jye Spinks, Paris McLaurin, Jorja O'Connor, Madalynn Baumanis, Brett Webber, Rose Dennehy; (second row) Ashley Carboon, Damien French, Tristan Roleff, Rutvik Chaudhary; (seated) Heath French, Andre Roleff, Chiara Lestino, James Parker, Lachlan Carboon, Mitchell Hobbs; (front) Harsh Chaudhary and Ryan Falconer, at the 2018 Australian National Championships held in Melbourne last weekend, where they qualified to compete in next year's VEX world championships.

all-round team, robot performance and judged (world championship qualification); VEX IQ robot skills champion award, for top combined programming and driving skills (world championship qualification); VEX IQ teamwork finalist, runners-up

in the finals; VRC amaze award, for the team with an amazing, well-rounded and top performing robot; VRC create award, for the robot with a creative engineering solution; and VRC promote award, for the team which has best showcased VEX

robotics in the community.

The seventh award was the VRC teachers of the year award, presented to Maree Timms and Brett Webber, whose passion and dedication has enabled Galen to achieve in this area.

Galen's junior VEX IQ

team 48327W will head to the world championships in April next year, a year after the school sent its first national representatives to Kentucky, and the students are excited about the opportunity ahead.

Comprising year eights Paris McLaurin and Jorja O'Connor,

and year sevens Chiara Lestino and James Parker, this team is ranked 49th in the world, out of 1626 teams.

Their hard work has paid off, after working on their robot since July during many recess, lunch and after school sessions.

Also at the nationals, year 11 Galen student Madalynn Baumanis was the FORD #GirlPowered Champion at the event.

She played a key part in the opening ceremony by being part of the #GirlPowered Q&A session with Lee Constable, presenter of Channel 10 science show 'Scope', and a Girls in STEM Advocate.

Year 11 students Rutvik Chaudhary and Tristan Roleff took on the roles of MC and commentators on the day, and got to teach Lee Constable the technical side of VEX, commentating alongside her on Saturday. On Sunday, they commentated all the finals matches.

Year 10 student Harsh Chaudhary and former Galen student Kyle Fry worked as vision operators, running the live feed to the big screens over the weekend, while parent Phil Richardson was also there, running the Tournament Manager software, maintaining match results and rankings.

# Attachment 5: Chronicle article on VEX Robotics Success

wangarattachronicle.com.au

THE CHRONICLE

## Local robotics champs all ready to rock worlds



BY ANITA  
McPHERSON  
amcpherson@  
nmedia.com.au

A YOUNG local team of robotics enthusiasts are looking forward to taking on the world at the 2019 VEX Robotics World Championships being held in the USA next week.

This time it will be the Galen Catholic College junior VEX IQ team, accompanied by three mentors, who will be competing against the brightest sparks from around the globe in the world's largest robotics competition, which hosts around 17,000 people over its two week run.

Galen eLearning coordinator Maree Timms said the team consists of three girls and one boy, including year eight students Chiara Lestino and James Parker, and year nine students Jorja O'Connor and Paris McLaurin.

She said they are the number one team in Australia, currently hold the Australian record high points score, and ranked 392 in the world out of 4000 teams.

"The students are all looking forward to meeting teams from all over the world and they'll be competing against 56 different countries," she said.

"The group will be there for two weeks, flying out on Easter Monday and coming home via a quick stop at Washington DC to see the Smithsonian Air and Space Museum.

"Being the 50th anniversary of the moon landing, they are looking forward to seeing the exhibits there."

After their success at the world championships in 2018, last year's team members were distributed across various new teams and the senior members of



**SCIENCE IN ACTION:** Galen Catholic College students and VEX team members (from left) Chiara Lestino and Jorja O'Connor, demonstrated their robotics skills during Geek Con at the Wangaratta Library.

the Galen VEX program became mentors.

Ms Timms said the mentors have been sharing their knowledge and skills with the junior teams throughout the year.

"This mentorship has been wonderful and through this, Galen almost had three teams qualify for the VEX Worlds," she said.

"One team came second in the competition finals, and the other came fifth in the skills challenge,

(with the fourth team qualifying for the worlds)."

The mentors have also been volunteering at VEX events both regionally and nationally, impressing VEX officials so much they were invited to volunteer at the world championships.

So while the young team will be doing their best on the field and in the competition, the seniors will also be gaining invaluable experiences playing key volunteering

roles at the championships.

All year 12 students, Madalynn Baumanis will be a judge, while Rutvik Chaudhary and Tristan Roleff will be interchanging roles as referees and tournament manager software operators (helping broadcast scores and results on the big screens).

The 2019 VEX Robotics World Championships will be held in Louisville, Kentucky from April 24 to 30.

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VISIT OUR W

West Side Story:

Muriel's Weddin

Bright Autumn I

Barnum - The C

Charlie & the C

6 d Hahndorf E

7 d Cornish Fes

12 d Land of In

15 d Northern

10 d Red Centr

9 d Lightning I

10 d Alice Spri

9 d GHAN incl.

16 d Across th

10 d Cape Yor

15 d QLD: Cai

8 d Calming I

6 d Scenic S

9 d Flinders I

6 d Five Rive

9 d Lord Ho

7 d Victor Hi

15 d Tasma

11 d Tasma

4 d Celebrat

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10 d Vietna

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