At Wonder of Science, as so many people have said, 2020 was certainly ‘the year like no other’! However, with the opportunity to now reflect on the year it is very gratifying to see how much our small team achieved and that our rapid response to COVID-19 meant that “STEM didn’t stop” for students in our schools. Students and teachers continued to be excited and engaged in authentic STEM inquiry as the Young Science Ambassadors ‘zoomed’ (video conferenced) their way into schools across the state. In addition, digital resources were innovated for the 2020 Virtual WoS programs and these now enhance the suite of WoS offerings to schools, as well as our capacity to extend our reach into more remote locations.

As the team now all looks forward to a new year, I am very excited to report that we will celebrate 10 years partnering with Queensland schools in 2021, and as you might have noticed we have implemented a branding refresh to begin the celebrations.

There will be some special celebration events for WoS schools, including the return of Camp Koala and the Avoid Island turtle research program through our partnership with Queensland Trust for Nature (QTFN).

Many schools have already signed on for 2021 but it’s not too late to register your interest - more information available at www.wonderofscience.com.au or email us at wonderofscience@uq.edu.au

Keep reading to learn more about the WoS impact in 2020 and how partnering with us is building a STEM culture in schools and beyond!

ROBYN BULL
DIRECTOR
WONDER OF SCIENCE
“A renewed national focus on STEM in school education is critical to ensuring that all young Australians are equipped with the necessary STEM skills and knowledge that they will need to succeed.”

National STEM School Education Strategy, 2015

**PROMOTING A STEM CULTURE**

**WHERE STUDENTS UNDERSTAND THE IMPORTANCE OF STEM AND BELIEVE THAT STEM EDUCATION AND CAREERS ARE ACCESSIBLE TO THEM**

**STEM INQUIRY TASKS**

- The Wonder of Science challenge tasks immerse students in authentic and collaborative inquiry
- Students develop critical and creative thinking skills as they are challenged to develop a group response to a real-world problem or scenario

**YOUNG SCIENCE AMBASSADORS**

- The Young Science Ambassadors support implementation of Wonder of Science, and judge presentations at the student conferences
- Teachers describe them as “bringing STEM to life” in their schools

**PARTNERSHIPS**

- STRATEGIC PARTNERSHIPS - BETWEEN SCHOOLS, UNIVERSITIES, INDUSTRY GROUPS, NON-PROFIT ORGANISATIONS & GOVERNMENT AGENCIES
- Wonder of Science fosters partnerships between schools and the wider community through our partner organisations
- Our partners support the student conferences and other STEM experiences for participating schools

**STUDENT CONFERENCES**

- Student conferences - aspirational regional and state level student showcase events
- Representative teams from participating schools are invited to present their challenge task response at a one-day regional student conference
- Winning teams receive medals and a trophy for their school and are then invited to State Conference held at a university campus each year

**TYPICAL TIMELINE FOR SCHOOL ENGAGEMENT WITH WONDER OF SCIENCE**

1. **Week 1**
   - Visit 1 - Young Science Ambassadors (YSAs) Introduce Challenge Task

2. **Week 3**
   - Students investigate and research task
   - Visit 2 - YSAs discuss response and presentation ideas

3. **Week 8**
   - Students develop task response

4. **Week 10**
   - Regional Conference

5. **State Conference**

6. **End of Year**

**THE WONDER OF SCIENCE APPROACH**

- Promotes problem-solving skills, including critical, creative, collaborative and ethical thinking
- Develops deep understanding of STEM concepts in students
- Develops the student capabilities required to achieve and succeed in a rapidly advancing and changing world
- Supports teacher capability for quality STEM teaching and learning

**St Peters Lutheran College**

Year 7 Champion Team - Virtual State Conference 2020

Wonder of Science supports implementation of the Australian Curriculum for students in Years 5 to 9. Schools typically engage with Wonder of Science for one term each year.
The in-person program fee is $3500 per school (for up to 6 classes) for a term — that’s less than $25 per student

Professional learning options for teachers: STEM Inquiry – the WoS approach

WoS challenge tasks, teacher unit overview, lesson plans, criteria sheets, investigation planners and Young Science Ambassador video lessons

Two ambassador visits (in-person) during the term

Attendance at a regional student conference for a representative team from each class with trophy and medals for winning teams

Attendance at State Conference for all regional winning teams and their teachers

Extended opportunities for students through our strategic partnerships — for example, university programs and QTFN’s Camp Koala and Avoid Island programs

The virtual program fee is $2500 per school (for up to 6 classes) for a term — that’s less than $17 per student

Professional learning options for teachers: STEM Inquiry – the WoS approach

WoS challenge tasks, teacher unit overview, lesson plans, criteria sheets, investigation planners and Young Science Ambassador video lessons

Two virtual ambassador visits during the term via video conferencing

Participation in a regional student conference via video conference for a representative team from each class with trophy and medals for winning teams

Participation in State Conference via video conference for all regional winning teams and their teachers

Andreea Ryalls
Head of Department - Science
Stretton State College

“Thank you so very much for all your hard work with the Wonder of Science Program. The flexibility and adaptability of the program is a testament to your tenacity! We had an absolute blast with the challenge tasks this year and we have learnt a lot!”
2020 IMPACT

This year Wonder of Science reached 8129 people including students, teachers, parents and community members.

992 additional students reached via other STEM activities - e.g. the Flying Scientists Program.

Virtual State Conference 2020 Champion Team Presentations

Year 5 - Kimberley Park State School
Year 6 - Stretton State College

76 students attended the Virtual State Conference.

Year 7 - St Peters Lutheran College
Year 8 - Cairns School of Distance Education

542 students attended a regional conference.

76

Virtual State Conference 2020
Champion Team Presentations

3689 students attended the Virtual State Conference.

110 Young Science Ambassadors

71% of Young Science Ambassadors are female.

83900 impressions on the Wonder of Science Twitter account.

Year 9 - Narangba Valley State High School

50% of participating schools are rated below the average socio-education advantage (ICSEA).

36 schools from regional, remote and metropolitan Queensland.

27 are state schools.
**YOUNG SCIENCE AMBASSADORS**

Despite the many implications of COVID-19, 2020 included continuing and heightened interest from Higher Degree Research (HDR) students for the Young Science Ambassador Program. 45 HDR students from five Queensland universities (breakdown by institution opposite page) were recruited into the program – completing virtual training and shadowing existing Ambassadors on virtual classroom visits.

59% of the 2019 Ambassadors continued in the 2020 program and 24% of the total 110 Ambassadors have been with WoS for more than two years – significantly enhancing our capacity to provide experienced and professional young scientists to schools and demonstrating the popularity of the program for HDR students. Indeed, 20 continue with WoS following completion of their PhD!

The percentage of females (71%) in the Ambassador program also remains high – over 65% for the last 4 years – demonstrating our commitment and contribution to the national Women in STEM agenda to address gender inequity in STEM.

**YSA RETENTION**

<table>
<thead>
<tr>
<th>Year</th>
<th>NEW</th>
<th>RECURRING</th>
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<tbody>
<tr>
<td>2013</td>
<td>21</td>
<td>0</td>
</tr>
<tr>
<td>2014</td>
<td>28</td>
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</tr>
<tr>
<td>2015</td>
<td>21</td>
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<tr>
<td>2017</td>
<td>61</td>
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<tr>
<td>2018</td>
<td>107</td>
<td>107</td>
</tr>
<tr>
<td>2019</td>
<td>107</td>
<td>107</td>
</tr>
<tr>
<td>2020</td>
<td>110</td>
<td>110</td>
</tr>
</tbody>
</table>

**INSTITUTION BREAKDOWN**

- The University of Queensland: 69%
- Griffith University: 17%
- Queensland University of Technology: 13%
- James Cook University: <1%
- Bond University: <1%

**GENDER BREAKDOWN**

- 2016: 39% female
- 2017: 65% female
- 2018: 69% female
- 2019: 76% female
- 2020: 71% female

"I just want to congratulate the YSAs on their virtual YouTube presentations - very thorough and engaging for the learners they’re aimed at. The saying, “Necessity is the mother of all invention” is ringing true here! I feel like this will be a new chapter in the Wonder of Science journey. Thank you so much for these wonderful resources.”

Joanna Rickert
STEM Teacher
Roma State College
Taroom State School: Darling Downs Regional Conference

Happy Valley State School: Central/FNQ Virtual Regional Conference

Young Science Ambassador Virtual Lesson

Ambassador Judges: Metro Primary Regional Conference

PROMOTING A STEM CULTURE IN QUEENSLAND SCHOOLS

Edge Hill State School: Central/FNQ Virtual Regional Conference

Ambassador Lead Judges State Conference

WoS at the Foxwell State Secondary College Open Night

PROMOTING A STEM CULTURE IN QUEENSLAND SCHOOLS
VIRTUAL STUDENT CONFERENCES
10 regional conferences + 2 mini conferences were facilitated via predominantly Zoom video conferencing across the year. 16% of the winning teams from those conferences went on to participate in the Virtual State Conference, also provided via video conference on Friday, 27 November 2020. Students and teachers told us they learnt a lot in dealing with technology and internet challenges enabling them to effectively participate and enjoy the conferences – as the evaluation data opposite indicates.

THE 2020 STATE CHAMPION TEAMS
Year 5 - Kimberley Park State School
Year 6 - Stretton State College
Year 7 - St Peters Lutheran College
Year 8 - Cairns School of Distance Education
Year 9 - Narangba Valley State High School

Students and teachers told us they learnt a lot in dealing with technology and internet challenges enabling them to effectively participate and enjoy the conferences – as the evaluation data opposite indicates.

Well done to all participating students (and their teachers) and congratulations to the 2020 WoS State Champions – including Coby (team of one) from Cairns School of Distance Education.

THE 2020 STATE CHAMPION TEAMS

Coby Wonder of Science Year 8 State Champion

“In 2020 I had an amazing experience competing in the Wonder of Science competition. I had so much fun presenting my experiment and learning about other participants’ experiments. [Wonder of Science] has taught me a lot about presenting in front of others and how the science behind each experiment worked. All in all this was an awesome experience and I can’t wait to participate again next year.”

“Coby is a student at Cairns School of Distance Education (CSDE). CSDE students were unable to participate in group responses to their WoS challenge task, so Coby was our first-ever “individual” participant and State Champion.

STUDENT CONFERENCE EVALUATIONS

91% agree or strongly agree that presenting their team project at the conference was a valuable learning experience

86% agree or strongly agree that observing other team presentations was interesting and valuable

68% agree or strongly agree that they have a GREATER interest in studying STEM-related subjects in Years 11 & 12

95% agree or strongly agree that participating in the Wonder of Science conference was an exciting and challenging opportunity

STUDENT CONFERENCES
542 students attended a regional conference
150 teams participated in a regional conference
70% of students that attended State Conference were female
65% of State Conference Champions were female

Ben Cooke
Principal
Meandarra State School

“Great job on the conference this year, it was great to be involved in a year with so many things cancelled.”

542 students attended a regional conference

Spinifex State College Year 7 Teams - Mount Isa Regional Conference
Even with COVID-19 pandemic restrictions limiting our capacity, Wonder of Science still impacted over 8000 people across Queensland in 2020!

“Congratulations WoS team for organising a wonderful opportunity for our students at CSDE. With your efforts through WoS their lives have been enriched and the teachers have been inspired to extend their students. I’m of course super excited with the outcome and so proud of the students.”

Markus Honnef
Head of Department - Science
Cairns School of Distance Education

<table>
<thead>
<tr>
<th>Cluster/Region</th>
<th>Funding model(^1)</th>
<th>Number of schools</th>
<th>Number of classes</th>
<th>Total students</th>
<th>Conference attendees</th>
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<td></td>
<td>Darlington Primary (Year 7, 8 and 9) 2 39</td>
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<td>Total 7 87</td>
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<td>Year 5/6</td>
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<td>Year 9</td>
<td>7</td>
<td>South-East Primary (Year 5 and 6) 2 29</td>
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<td>351</td>
<td>Total 6 87</td>
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<td>South-East Primary (Year 5 and 6) 2 29</td>
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<td>Year 9</td>
<td>7</td>
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<td>161</td>
<td>Total 2 29</td>
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<td>9</td>
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<td>Year 7</td>
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<td>Year 9</td>
<td>3</td>
<td>Metro South Secondary (Year 7, 8 and 9) 4 66</td>
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<td></td>
<td></td>
<td></td>
<td>Total 52</td>
<td>1233</td>
<td>Total 21 224</td>
</tr>
</tbody>
</table>

Total in WoS STEM inquiry program: 36 students - North Coast Virtual Regional Conference

Additional school visits (Flying Scientists): 6 Years 1 - 12 9 274

Additional reach through other STEM activities (Prep - Year 12): 718

Bundaberg State High School students - North Coast Virtual Regional Conference
The Flying Scientists Program provides access to some of Queensland’s leading scientists for regional and remote communities. The Flying Scientists are building Queenslanders awareness and understanding of the incredible cutting-edge research happening right here in our state.

2020 highlighted the importance of enhancing community engagement with science and the scientific community empowering our citizens to make well-informed decisions about their health, as well as that of others and the planet. The Flying Scientists are looking forward to continuing this exciting work across Queensland in 2021!

**2020 FLYING SCIENTIST EVENTS**

<table>
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<tr>
<th>Date</th>
<th>Location</th>
<th>Flying Scientist</th>
<th>Number of Students</th>
<th>Other attendees</th>
<th>Number of Classes</th>
<th>Total participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday 17 August</td>
<td>Spinnifex State College, Mt Isa</td>
<td>Jyotsna Barta, Michela Mitchell and Kate Helmstedt</td>
<td>15</td>
<td>1</td>
<td>2</td>
<td>17</td>
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<tr>
<td>Wednesday 19 August</td>
<td>Happy Valley State School, Mt Isa (Year 6)</td>
<td>Derek Long</td>
<td>57</td>
<td>2</td>
<td>2</td>
<td>59</td>
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<tr>
<td>Thursday 20 August</td>
<td>Cairns School of Distance Education</td>
<td>Michela Mitchell, Shaneel Chandra, Catherine Kim and Linlin Ma</td>
<td>32</td>
<td>16</td>
<td>NA</td>
<td>48</td>
</tr>
<tr>
<td>Friday 21 August</td>
<td>Happy Valley State School, Mt Isa (Year 1)</td>
<td>Bronwyn Smithies</td>
<td>70</td>
<td>3</td>
<td>3</td>
<td>73</td>
</tr>
<tr>
<td>Friday 21 August</td>
<td>St Brendan’s College, Yeppoon</td>
<td>Jyotsna Batra, Jennifer Gunter and Carolyn Jacobs</td>
<td>100</td>
<td>4</td>
<td>3</td>
<td>103</td>
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<tr>
<td>Saturday 22 August</td>
<td>Gympie STEM Hub</td>
<td>Kaylene Butler</td>
<td>NA</td>
<td>16</td>
<td>NA</td>
<td>16</td>
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</table>

<table>
<thead>
<tr>
<th>6 events</th>
<th>Total National Science Week</th>
<th>11 Scientists</th>
<th>274</th>
<th>42</th>
<th>10</th>
<th>316</th>
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<tbody>
<tr>
<td>28 – 29 February</td>
<td>Chinchilla – World Science Festival</td>
<td>Dr Maryam Shirmohammadi</td>
<td>3370</td>
<td></td>
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</tr>
</tbody>
</table>

| 7 events | Totals | 12 Scientists | 274 | 42 | 10 | 3686 |

**2020 FLYING SCIENTIST VIDEOS**

<table>
<thead>
<tr>
<th>Title</th>
<th>Flying Scientist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtual Flying Scientist Promo</td>
<td>Bonnie Quigley, Andreas Kupz, Ben Allen, Michela Mitchell</td>
</tr>
<tr>
<td>Flying Scientists - Investigating Viruses</td>
<td>Bonnie Quigley, Andreas Kupz, Ben Allen, Michela Mitchell</td>
</tr>
<tr>
<td>Flying Scientists respond to burning science questions</td>
<td>Michela Mitchell, Ben Allen, Carolyn Jacobs</td>
</tr>
<tr>
<td>Flying Scientists respond to burning Marine Science questions</td>
<td>Michela Mitchell, Laura Blamey</td>
</tr>
<tr>
<td>Flying Scientists respond to burning Physics questions</td>
<td>Carolyn Jacobs</td>
</tr>
<tr>
<td>Flying Scientists respond to burning Environmental Science questions</td>
<td>Michela Mitchell</td>
</tr>
</tbody>
</table>

**6 videos** **6 Scientists**
FINANCIAL OVERVIEW 2020

Income ($'000)
- Partner contributions: 155
- Ambassador funding (all universities): 120
- The University of Queensland additional contribution*: 95
- Queensland Department of Education: 150
- Advance Queensland (Flying Scientists Program): 30
- School participation fees: 50
- Total: 600

*support for salaries and program delivery

Expenditure ($'000)
- Staff salaries: 435
- Programs delivery cost: 28
- Young Science Ambassador award payments: 49
- State Conference cost: 1
- Total: 513

Operating result: 87
Committed forward 2021: 357
2020 BALANCE: 444

*The University of Queensland provides additional in-kind support to host Wonder of Science and support the team.

The Wonder of Science team was privileged to be awarded the 2020 UQ Research and Innovation Portfolio “Love your work!” Award for their work providing opportunities for higher degree research students to engage in a meaningful way with schools and broader community; and their fast response enabling the program to continue in a meaningful way despite the ongoing COVID-19 situation. This is the second consecutive year that Wonder of Science has received a UQ Research and Innovation Portfolio Award having received the team “Impact Award” in 2019.

Once again, Wonder of Science continued their impressive work positively impacting students and teachers, as well as the broader community across Queensland – as they pivoted to produce and implement virtual programs and online resources in response to the COVID-19 disruptions of 2020. We were so impressed with their efforts that we awarded them a ‘Love Your Work’ Award as part of the UQ Research and Innovation Portfolio Awards for 2020 – photo opposite.

Through the efforts of this small team, over 100 Young Science Ambassadors continued to support authentic STEM inquiry in classrooms, helping to inspire the next generation of scientists and STEM professionals that are vital for our future. 2020 certainly demonstrated the importance of STEM and highlighted how scientific research is fundamental to a safe and secure future for our communities. Congratulations, Wonder of Science - I can’t wait to see what 2021 brings and I look forward to helping you celebrate “10 Years partnering with Queensland schools”!

Schools that participated in Wonder of Science
- Regional Conference Winners
- State Conference Champions

Professor Bronwyn Harch
Deputy Vice-Chancellor (Research) and Vice-President (Research), BEnvSc(Hons) Griff., BEd QUT, PhD Qld., FTSE, FQAAS, GAICD

Professor Bronwyn Harch presenting the WoS Team with the Research and Innovation Portfolio “Love your work!” Award

Through the efforts of this small team, over 100 Young Science Ambassadors continued to support authentic STEM inquiry in classrooms, helping to inspire the next generation of scientists and STEM professionals that are vital for our future. 2020 certainly demonstrated the importance of STEM and highlighted how scientific research is fundamental to a safe and secure future for our communities. Congratulations, Wonder of Science - I can’t wait to see what 2021 brings and I look forward to helping you celebrate “10 Years partnering with Queensland schools”!

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PARTNERS

Wonder of Science would not be possible without our valued partners - thank you to all!

PARTNER WITH US

We welcome organisations, philanthropic foundations, universities, and other STEM agencies as partners.

For further information, please contact:
Robyn Bull, Wonder of Science Director

CONTACT

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DIRECTOR

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robyn.bull@uq.edu.au

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