Australia's National
Science Agency

Generation STEM

2024 Annual Review

Acknowledgement of Country

CSIRO recognises that Aboriginal and Torres Strait Islander peoples have made and will continue to make extraordinary contributions to Australian culture, economy and science and we aim to promote and support the vision of 'A science landscape in respectful partnership with Indigenous Australia delivering innovative, sustainable, holistic solutions to meet our greatest national challenges'.

Generation STEM is managed by CSIRO and made possible by the NSW Government's $25 million endowment to the Science and Industry Endowment Fund (SIEF).

SCIENCE AND INDUSTRY ENDOWMENT FUND

NSW GOVERNMENT

Contents

Executive summary

2024 was a significant year for Generation STEM, marking its transition from Operational Plan 2 to Plan 3. That is to say that Generation STEM shifted its focus from growth in program delivery to building a legacy and maximising impact by leveraging the insights, recommendations, and successes achieved throughout the program's journey. This transition also marked the commencement of new initiatives to address systemic challenges.

Generation STEM saw the continued delivery of three key programs in 2024: STEM Community Partnerships Program (STEM CPP), Deadly in Generation STEM and Generation STEM Links.

STEM CPP being the most established program has shifted its focus toward ensuring the program's legacy and long-term sustainability beyond the duration of the current funding. Many schools have become less reliant on the Generation STEM team in delivering STEM CPP, demonstrating the program's growing self-sufficiency.

Deadly in Generation STEM and Generation STEM Links continue to deliver impact while beginning to follow suit in the legacy journey. Our evaluation shows Deadly in Generation STEM has raised awareness and sparked greater interest in both STEM and understanding Culture. The success of Generation STEM Links in New South Wales has led to its model and insights being adapted for "spin-off" programs in other states and across specific industry sectors.

Alongside the growing momentum of Generation STEM's programs, the team has also commenced addressing systemic challenges in STEM education – an essential component of the program's long-term legacy. Various initiatives were launched to advocate for evidence-based practice, enhance industry capability in STEM education, demystify STEM, and better engage parents and families in the process.

As part of tackling these systemic challenges, the rebranded STEM INSIGHTS (formerly Evidence X) identified two projects that aim to transform STEM education programs through evidence. The first focuses on lifting the capability of the STEM education providers to generate, use, and share evidence to increase impact, and the second is a student-centred system to harvest insights from STEM education participants across time and experiences.

Looking ahead, the next three years will see Generation STEM maintaining a sharp focus on amplifying its impact and embedding the successful program elements, ensuring that the program leaves a lasting, meaningful imprint on the STEM education system

Generation STEM
2024 year in review

4737 students across three programs

63 teachers participated in Deadly in Generation STEM Teacher Professional Learning

68 Generation STEM Links placement completed with a further 32 underway

39,600 webpage views

First Deadly in Generation STEM Camp held in Moree/Narrabri regions

Expression of interest for STEM INSIGHTS attracted 1156 web views resulting in **157 applications**

Two industry breakfasts to build industry capability delivered in Western Sydney

>5500 community members at parent events

Monitoring and evaluation of the initiative shows that Generation STEM is...

increasing interest in STEM

increasing capability of educators to incorporate Indigenous knowledges in the classroom

increasing student confidence to pursue a STEM career

retaining underrepresented STEM tertiary students in STEM careers

Generation STEM is also...

...engaging with parents and families:

"Generation STEM brought such a valuable, and often overlooked, element to the Sydney Science Trail Community Day by focusing on parents as key enablers of STEM engagement. Their booth created a hub of excitement, with the CSIRO name drawing in families and the activities keeping them engaged. The activities and resources offered parents a chance to discover how they could play a pivotal role in nurturing their child's engagement with STEM, ensuring the impact could extend well beyond the event itself and into the everyday."

– Catherine Polcz, Learning Lead,
Australian Botanic Garden Mount Annan

...supporting all students to aspire to a STEM career:

"By integrating Indigenous perspectives and role models into STEM education, students not only deepen their understanding of cultural heritage but also explore potential career paths, fostering a sense of belonging and aspiration. By creating inclusive learning environments and offering access to resources and mentorship, students from diverse backgrounds are empowered to excel academically and pursue their aspirations in STEM fields."

– Aimee Woodley, Teacher,
Towradgi Public School

Strengthening impact through program delivery

STEM Community Partnerships Program (STEM CPP)

In 2024, the STEM Community Partnerships Program (STEM CPP) maintained its commitment to fostering long-term impact across schools and industries. This goal was advanced by deepening engagement with existing schools in the program and integrating feedback to refine key components.

Key achievements include:

- Providing tailored support to help schools engage more students with untapped STEM potential.
- Enhancing exposure to diverse career pathways through the annual #WithSTEMYouCan Career Expo.
- Expanding access to the TAFE Taster program.

Implementing teacher and industry feedback from 2023 focused on building both capability and capacity. Industry events were designed and delivered to enhance industry professionals' capacity to engage with young people in STEM as well as showcase STEM careers to students.

Efforts to build teacher capacity in less resourced schools included targeted professional development, additional site visits, and curriculum alignment support at the faculty level. These initiatives have boosted teacher confidence in delivering project inquiries and expanded the program into new school faculties.

These strategies have increased the number of low ICSEA[2] students participating to 51 per cent of the total cohort, (up from 44 per cent in 2023). Excitingly, the average number of students participating in each low ICSEA school is 148, compared to 41 in high ICSEA schools.

This shift is laying a strong foundation for long-term STEM engagement in underserved schools, enabling them to maintain program delivery and establish meaningful connections with local industry partners to continue providing impactful STEM education.

> "We have loved what has been offered by STEM CPP and are going to invest more time in it compared to other projects we have also been taking on. The industry exposure for students and the development of soft skills like creative thinking and communicating ideas was invaluable. Specifically, Amazon were amazing in what they provided for our students. With more time being able to be allocated, we will hopefully gain more out of the inquiry project next year."
>
> – STEM CPP Participating Teacher[1]

1 Quotes taken from: O'Brien, Mearon. STEM Community Partnerships Program Insights: 2024. Unpublished; 2025.

2 Index of Community Socio-Educational Advantage is a scale that provides an indication of the socio-educational backgrounds of students. 1,000 denotes the median score, so schools with a score of less than 1,000 are in the bottom half of relative advantage.

2024 highlights

4,594 students from 86 schools

3,120 student-industry interactions including 72 site visits held

Nine end-of-year showcase events held with 1,200+ attendees, including 200+ parents and guardians

14 per cent increase in industry offering multiple site visits

Strengthening impact for students with untapped STEM potential

The program's focus on deepening its impact within schools has created opportunities to engage more students who are not currently involved in STEM but show potential (Group 3 students), as recommended in Generation STEM's 2019–2022 Evaluation Report. A pilot initiative prioritised three schools from Local Government Areas in Western Sydney and the Central West, each with an ICSEA value below 1000, and a strong commitment to engaging their Group 3 students.

By addressing teacher challenges in engaging these students and identifying areas for additional support, the team implemented tailored strategies, including:

- Bespoke planning sessions to align the program with the schools' specific needs.
- Project Officers attended parent and community STEM events hosted by schools to support teachers in launching the program.
- Offering priority access to STEM-related site visits.

A key insight from the pilot was the importance of maintaining clear and ongoing communication with schools, alongside providing a well-defined understanding of who Group 3 students are. Teachers involved in the pilot reported increased confidence in implementing project-based inquiry activities and emphasised the value of connecting students with local industry to boost STEM engagement.

The pilot's impact was significant: collectively, the three schools expanded the program to reach an additional 365 students – a remarkable increase of over 270 per cent compared to the previous year. This shift demonstrates a move away from limiting the program to high-performing groups, allowing more diverse participation.

Building on this success, the team will continue collaborating with schools and developing customised resources to expand the program to more schools in 2025, further broadening its reach and impact.

What we learnt in 2024	How we will improve in 2025
Further support and tailored resources are needed to ensure the ongoing implementation of STEM CPP in identified Group 3 schools.	Work closely with schools to understand their unique needs and keep consistent communication throughout the year. Additional resources and roadmaps to be created and established in collaboration with teachers to ensure needs are met.
There is a need for further support of mentor and teacher relationships to ensure they are embedded in the operations of both schools and industry prior to the end of Generation STEM.	Additional support and webinars will be offered throughout the year to provide guidance on how these partnerships can be utilised to their full potential.
Teacher feedback suggests a greater need for opportunities where teachers can develop their confidence and capabilities in delivering the program.	Bespoke teacher professional learning workshops and further support with curriculum alignment to be offered to schools. The aim will be to build a network of teachers who are confident in sharing their skills and knowledge with other teachers involved in the program to ensure durable long-term impact.

Impact and evaluation insights for STEM Community Partnerships Program

Outcomes

In 2024, STEM CPP continued to achieve short term outcomes for participants and stakeholders based on evaluation surveys and interviews. Data reported below are from the annual student survey, which had a response rate of 31 per cent (n=147/469) from students who had opt-in parental/guardian consent. Key outcomes included:

Increased interest in STEM

- all program elements that students reported participating in were associated with an increased interest in STEM, although some program elements had greater self-reported impact than others. For example, 52 per cent of student respondents reported that attending the showcase made them 'much more' interested in STEM, compared to only 29 per cent for visiting a local business or work site.

Change in attitudes and awareness of STEM

- the greatest change in retrospective pre and post self-reported attitudes, understanding, and awareness of STEM were that *"STEM is useful in everyday life"* and *"I am aware of the type of STEM jobs I can work in."*

Increase in transferable skills and awareness of STEM pathways and careers

- 92 per cent of respondents (n=106) indicated they strongly agree or agree that they were more confident about their problem-solving abilities
- 85 per cent of respondents (n=98) indicated they strongly agree or agree that they were more confident communicating their ideas to others
- 81 per cent of respondents (n=94) indicated they strongly agree or agree that they know more about potential STEM jobs they can work in
- The educator survey was distributed to n=234 teachers with a response rate of 11 per cent. Regarding the overall impact that STEM CPP has had on their students' likelihood of studying STEM after Year 10, 23 per cent reported they believe the program has had a significant impact and 62 per cent reported a moderate impact.

What worked

Based on surveys and interviews with stakeholders and program team feedback, several program elements and approaches were identified as working successfully:

- Targeting lower ICSEA schools (<1000) to offer dedicated and customised support to deliver the program regardless of target student cohort is beneficial for improving overall implementation feasibility of the program in those contexts.
- Industry professionals and educators reported high satisfaction with the #WithSTEMYouCan Careers Expo delivered in 2024. Educators were extremely positive in their feedback regarding this opportunity for their students to engage with STEM pathways and careers.
- Where matched mentorships have occurred between industry partners and schools in 2024, these have been highly valued by industry and educators.

Barriers and issues

Educators and industry professionals both report challenges with maximising the potential of the role of industry partnerships within schools, particularly through the industry mentor model. For example, 32 per cent of student respondents reported interacting with an industry professional at their school compared to 82 per cent at external events (e.g. site visits, Careers Expo, showcase).

Teachers involved in the test & learn initiative for Group 3 students reported difficulty engaging the target student cohort in the program, despite the piloted model of support delivered in 2024.

Educators continue to report that systemic issues, such as staffing, time, and broader school/faculty support and engagement with the program, made it difficult to successfully embed the STEM CPP model into their classrooms.

Deadly in Generation STEM

In 2024, Deadly in Generation STEM was delivered across Dharawal and Kamilaroi Countries, and laid groundwork for a lasting legacy in both regions.

The Teacher Professional Learning (TPL) workshop underwent a comprehensive redesign to better empower educators with the skills needed to deliver Indigenous STEM inquiries while fostering culturally responsive practices in schools.

These initiatives equipped teachers to effectively implement and localise Indigenous STEM inquiries for their students.

A key focus of the program was fostering strong partnerships between educators and support staff, such as Aboriginal Education Officers, to build networks for peer-to-peer support and provide support beyond the Generation STEM team.

A major milestone was the successful delivery of the inaugural Deadly in Generation STEM camp on Kamilaroi Country, attended by 10 students. This immersive on-Country experience provided participants with a unique opportunity to connect with Culture, deepen their understanding of how Aboriginal peoples engage with STEM concepts, and explore innovative and engaging learning methods.

Deadly in Generation STEM continues to see growing interest from schools in both Illawarra and Moree. More schools are expanding their involvement by enrolling additional teachers in the professional learning program.

The program's impact is evident in both schools and the wider community. Students report a stronger sense of wellbeing and pride after attending the camps, while growth in industry engagement is in recognition of the programs transformative influence on local youth.

The program's success lies in the trust and respect built with local communities, Cultural Knowledge Holders, and STEM professionals. These relationships form a resilient network, enabling key program improvements that will further strengthen its positive and lasting impact on schools and communities.

2024 highlights

63 teachers and teachers support staff from 26 schools attended the teacher professional learning program (23 percent increase in teacher participation)

26 students participated at the STEM camps across the Illawarra and Moree/Narrabri regions.

First camp held in Moree/ Narrabri regions with positive feedback from students and stakeholders involved.

Five young Aboriginal STEM professionals engaged as camp leaders across both camps to act as mentors and role models for the younger participants.

CASE STUDY
Creating a STEM learning legacy

In 2024, our two *Deadly in Generation STEM* camps engaged 26 Aboriginal students in a transformative experience. Designed and delivered in collaboration with Cultural Knowledge Holders, STEM professionals, camp leaders, and community organisations, the camps provided a unique opportunity to connect culture and STEM in meaningful ways.

Students reported increased well-being, a stronger sense of cultural pride, and heightened interest in STEM and Indigenous Knowledge. Through the attendance of these camps, particularly through interactions with community, participants gained valuable insights and inspiration to pursue STEM pathways.

The camps which centred around the theme "*Caring for Country*," took students on a deeply personal journey of cultural pride and identity. Through art, dance, song, and storytelling, students connected to their own Country while expanding their understanding of Indigenous STEM Knowledge. They also explored local STEM career opportunities, seeing firsthand what's possible and finding inspiration from their community.

> "[Deadly in Generation STEM is so important] because students can see themselves in spaces, it shows they have a voice in STEM and ancestors have paved that path."
>
> – Cliodhna Maguire, *First Nations Youth Community Greening Officer, Botanic Gardens of Sydney, and Deadly in Generation STEM Camp Leader.*

Highlights included learning about Indigenous astronomy, the contemporary use of native grains, and crafting boomerangs. Students coded drones for koala conservation, planted native trees with rangers from the Illawarra Local Aboriginal Land Council, and explored the chemistry of dyes in traditional weaving practices.

These impactful experiences were made possible by the strong, trusting relationships the team has cultivated over the years with local communities, Cultural Knowledge Holders, and STEM professionals. Their support and investment underscore the importance of bridging Traditional Knowledges with modern science, creating pathways that empower and inspire the next generation of Aboriginal STEM leaders.

Supporting teachers to incorporate Indigenous perspectives in authentic and meaningful ways

A key focus for 2024 was to enhance and strengthen the Teacher Professional Learning (TPL) program. To enhance teacher expertise and achieve lasting impact, this reimagined initiative featured a blend of webinars, face-to-face workshops, and reflection sessions, and for the first time, was delivered across both regions.

The newly introduced webinar series was designed to connect teachers with their peers while providing practical and relevant insights into Indigenous Science in practice. These sessions showcased current examples of CSIRO science, illustrating how to effectively deliver inquiry-based learning and integrate Indigenous Knowledge into modern science education. By creating multiple points of contact with program partners , the webinars offered sustained support and guidance for implementing the program within schools.

The face-to-face workshops provided a platform for teachers to engage deeply, connect with local communities, experiment with inquiry-based approaches, and collaboratively plan for the year ahead. These workshops were pivotal in fostering ongoing engagement and equipping educators with the tools and confidence needed to succeed.

These activities laid the groundwork for schools to establish their own communities of practice – both internally and through connections with other schools in their regions. The revised program was designed to support beyond teachers to include school support staff and leadership, ensuring a holistic approach to professional development. This strategy is critical for the long-term durability and legacy of Generation STEM.

Participants expressed high levels of satisfaction with the professional learning program, highlighting its significant role in driving cultural change within the education system. The program was praised for authentically representing Aboriginal Culture, deepening teachers' understanding of Indigenous sciences, and building their confidence. By addressing educators' initial apprehensions, the program empowered them to implement inquiry-based learning authentically and effectively.

Feedback revealed that when multiple staff members from the same school participated, it was more likely to inspire a whole-school approach to the program. Additionally, the training's adaptability was noted, with teachers finding it easily transferable to new school environments if they relocated.

What we learnt in 2024	How we will improve in 2025
The camps shape the STEM journey of camp leaders, not just the students attending. They broaden their educational perspectives, leadership opportunities and contribute to their retention in STEM.	Support camp leaders to build their confidence and leadership skills with training and workshop activities prior to camps.
Early career and teachers new to the region may require more time to build community connections with local Cultural Knowledge Holders and Elders.	Continue to involve Cultural Knowledge Holders in the TPL and/or reflection sessions to support teachers to build on connections, and where unable to establish connections directly, provide teachers with options to connect to Country.
Teachers reflected the resources and support provided were incredibly useful, but to ensure they will continue to be used beyond the life of Generation STEM, resources need to be reformatted, built into units and re-ordered as they appear in the curriculum. There is also a need to connect the resources to today's science.	Create a new prototype based on an existing Indigenous STEM inquiry to be tested with a primary school and secondary schools. Redevelop the new Indigenous STEM resources in collaboration with other CSIRO Indigenous programs for use by current and future programs.

Impact and evaluation insights for Deadly in Generation STEM

Outcomes

In 2024, students participating in STEM camps were asked about their perspectives at the end of camp compared to before camp. Of all the potential areas of change, the areas with the highest self-reported change were in STEM awareness and interest, specifically:

- awareness of different STEM related jobs
- awareness of Indigenous STEM knowledges
- awareness of different STEM subjects to study
- interest in working in a STEM career in the future.

In 2024, 45 educators completed end-of-session surveys, and of these:

- 100 per cent of survey respondents were very (30 per cent) or extremely (70 per cent) satisfied with the session.

Educators' top three most valued elements of the session were:

1. hands-on activities with inquiries
2. linking Indigenous Knowledges to the curriculum
3. planning the inquiry project for the classroom.

Reflection sessions with primary school educators in 2024 identified progress in a number of program outcome areas. As a result of program participation, educators were:

- localising resources and adapting them to a range of student cohorts
- connecting STEM to Indigenous Knowledges
- accessing a range of local Indigenous information and resources to use in their inquiries.

Overall, primary and high school educators reported:

- increased student engagement when delivering the inquiries
- increased range of First Nations voices embedded in their schools throughout the year
- connecting more with their Aboriginal Education Officers and Deadly in Generation STEM team to support engagement with the local Aboriginal community
- a deeper understanding about Traditional Indigenous Knowledges and its connections between STEM and country.

What worked

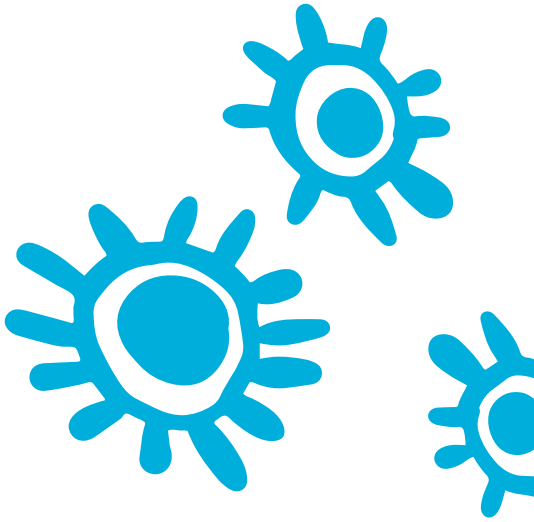
- For STEM camps, the inclusion of local Elders and Indigenous Knowledge Holders to directly engage with students supported student engagement and learning outcomes.
- Supporting Indigenous camp leaders in a culturally responsive way, including through training, pre-camp preparation activities, and on-camp peer support were enablers for a positive camp leader experience.
- For educators participating in the Teacher Professional Learning, most participants reported highly valuing the professional learning resources, particularly for their authenticity and flexible application in classrooms and across school event days.

Barriers and issues

In 2024, STEM camp challenges included:

- Securing Indigenous camp leaders to participate in camp and pre-camp planning and training sessions.
- Supporting all students to settle into the camp and form connections with their peers over a short period of time.

In 2024, educators engaging in TPL sessions primarily identified school system issues, such as a lack of resources, a lack of time, and educator turnover, as the biggest barriers to implementing STEM inquiries.



The value of retaining emerging Aboriginal STEM professionals

One of the key learnings from the camps was the pivotal role camp leaders play in supporting participants.

These leaders, who are young Aboriginal STEM professionals or undergraduate students, serve as mentors and role models for local students. Additionally, they inspired students by sharing their personal STEM journeys, highlighting achievable pathways to tertiary education and early career opportunities in STEM fields.

Reflections and feedback from camp leaders revealed that the experience profoundly impacted not only the student attendees but also the leaders themselves.

For the camp leaders, participating in the program shaped their educational perspectives, reinforced their commitment to STEM careers, and deepened their cultural understanding.

By learning local cultural knowledge alongside the participants, camp leaders strengthened their connection to community, enhancing the overall cultural impact of the camps.

To support and retain these emerging Aboriginal STEM professionals as camp leaders – and to ensure their continued success – Deadly in Generation STEM has developed several strategies for 2025:

1. **Re-engaging experienced camp leaders:** Inviting past leaders to mentor and guide new recruits, fostering continuity and knowledge-sharing across generations.
2. **Defining roles and expectations:** Clearly outlining responsibilities, expectations, and goals to ensure camp leaders fully understand their duties and the program's objectives.
3. **Pre-camp preparation:** Organising pre-camp gatherings to support leaders to develop their skills, build confidence, and enhance leadership abilities while fostering team connections.

These strategies are being planned with the goal of creating a robust and durable foundation for emerging Aboriginal STEM professionals.

By providing ongoing support and opportunities for growth, it will empower camp leaders to thrive in their leadership roles and STEM careers, ensuring long-term success and inspiration for future generations.

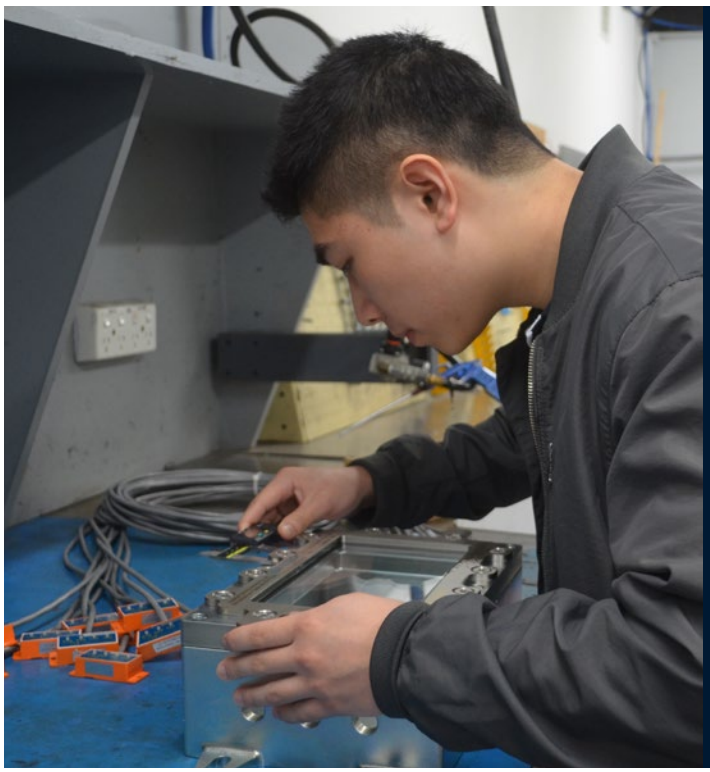
Generation STEM Links

Generation STEM Links has had a strong focus on diversifying and increasing the number of businesses hosting student interns this year, particularly in regional NSW. The team's targeted industry outreach to specific regions and collaboration with the STEM Community Partnership Program (STEM CPP) to leverage established partnerships, resulted in a 52 per cent increase in regional placements compared to 2023.

This year has also seen the program expand into new industries. Research and development; professional and financial services; and the energy sector now comprise a third of all student intern placements, while demand from advanced manufacturing and mining remains strong. This diversification demonstrates the program's ability to adapt to evolving workforce needs, offering students a wide array of STEM experiences across emerging and established industries.

A key achievement this year has been the program's positive contribution to breaking down systemic barriers to diversity and inclusion. Initial observations revealed the program places a higher percentage of students from underrepresented groups in STEM compared to traditional industry-led recruitment processes. Plans are underway to explore this trend further and collaborate with selected industry partners to enhance their diversity and inclusion practices, creating broader, lasting impacts.

The program's success in helping businesses recruit and retain junior STEM talent in NSW has been recognised with an extension approved by the Generation STEM Consultative Council. This additional 12-month extension will enable the program to further expand its reach into regional areas, strengthen its support for businesses, and solidify its role in fostering a robust, durable STEM talent pipeline.



2024 highlights

68 placements were completed with a further 32 underway^

1,971 students applied
(178 per cent increase from 2023)

70 per cent of student interns who completed internship in 2024 were offered ongoing employment

40 per cent of industry collaborators who applied in 2024 have applied for two or more student interns

89 per cent of student interns are from underrepresented groups in STEM

^placement underway indicates the internship started in the reporting year. The internship will finish the next year. Placement completed indicates that the internship finished in the reporting year. The internship may have started in the previous year.

Driving growth and opportunity

Generation STEM Links has achieved remarkable growth, with increasing demand for placements and in turn a higher number of student interns securing paid opportunities. The program continues to deliver exceptional results, with close to 80 per cent of student interns being offered ongoing employment throughout the lifetime of the program. This model has proven invaluable not only in providing students with hands-on STEM workforce experience before graduation but also in benefiting industry partners, who are choosing to retain interns as longer-term employees.

Key elements of Generation STEM Links that contributes to its success include comprehensive support during recruitment and placement, as well as a $2,500 financial contribution to participating businesses. Such features effectively lower barriers to hosting interns, enabling businesses – particularly small and medium enterprises (SMEs) – to invest in junior workforce development. The program has inspired a number of businesses to shift their strategies toward prioritising this investment.

"Aside from being able to practice my research skills, I learnt that remote work requires lots of communication and good time management. I enjoyed working in-person and came to realise that there are a lot of scientific opportunities in rural Australia for graduates."

– Generation STEM Links student intern

Impact and evaluation insights for Generation STEM Links

Outcomes

In 2024, 37 students responded to the end of placement survey, of these:

- 90 per cent of students agreed the internship met or exceeded their expectations
- 92 per cent of students were likely or extremely like to recommend the program to others.

Students rated their top three most valued placement experiences as:

1. access to and support from their supervisor
2. knowing their work contributed to the wider team
3. feeling like they were given meaningful work.

75 per cent of students who were surveyed agreed the internship had influenced future decisions about their careers. Of these:

- The majority described different ways their placement broadened their awareness and interests within STEM.
- A smaller number confirmed the placement encouraged them to continue with their STEM career.
- Two students described how their placement confirmed areas they did and did not want to pursue in STEM.

In 2024, 14 industry partners responded to the end of placement survey. The findings indicated that:

- Supervisors who were new to the program were surveyed about their expectations: 44 per cent of supervisors reported their expectations were met and 56 per cent that they were exceeded.
- Becoming an industry supervisor for the first time was easy (n=4) or very easy (n=5).
- 93 per cent of 13 supervisors were very (62 per cent) or extremely (31 per cent) satisfied with the performance of their student intern. One supervisor was moderately satisfied.
- Six out of eight supervisors experienced a positive improvement in their level of confidence to supervise student interns. Half of these supervisors had never supervised an intern previously.
- All seven new supervisors were extremely likely (n=5) or likely (n=2) to continue with the program.
- 100 per cent of supervisor respondents would recommend Generation STEM Links to other businesses.

Overall, supervisors observed the most change in their student interns in the following competencies:

- using their technical STEM skills to complete tasks
- using critical thinking to reason and draw conclusions
- communicating their ideas effectively to others.

What worked

- When student expectations were met, it was due to a range of enabling factors including doing meaningful work, a sense of independence within their project work, feeling like part of the team, a diversity of tasks, and an expectation going into the placement that matched the experience.
- Some supervisors noted that when student learning was structured progressively and a team approach was used to support their learning, this supported a successful placement experience.

Barriers and issues

In the small number of cases where student expectations were not met, students reported that it was due to a lack of guidance or supervision, or limited scope to their tasks/projects.

For industry partners, there were challenges in finding the right time for student placements to ensure they line up with available project work and supervisor availability.

Gaining operational insights for regional success

Attracting skilled employees poses a unique challenge for businesses in regional NSW. Through 76 placements across the life of the program in these areas, Generation STEM Links has uncovered key strategies that enhance the success of regional internships:

Foster a sense of belonging: Encourage student interns to connect with local organisations and participate in community events, building strong ties to the area.

Onboard with team integration: Include interns in team events during the onboarding process to help them feel welcomed and engaged.

Leverage the CSIRO brand: Utilise the trusted reputation of CSIRO to attract talent, particularly in roles that are traditionally hard to fill.

Tap into regional connections: Use Generation STEM Links' extensive recruitment pipeline to identify students with ties to regional areas, offering them opportunities to return to these communities for internships.

Provide practical support: Increase accessibility by offering on-site accommodation, along with covering food and travel expenses, in addition to the paid internship.

These insights highlight effective practices for addressing regional workforce challenges and creating meaningful opportunities for students and businesses alike.

"I was so happy to find a relevant and paid internship close to my family in Moree, and seeing it advertised by CSIRO was a huge motivating factor to apply. Brighann have been brilliant; it's a great culture, and I really feel like part of the community, while also learning new skills and gaining valuable experience as a mechanical engineer. It's been exactly what I've wanted to see and learn, and I've felt so supported by both Brighann Ginning and the Generation STEM Links team at CSIRO."

– Steven, University of Newcastle and Generation STEM Links intern

"Generation STEM Links successfully recruited a local student with the technical skills we needed, which were key criteria for us. The placement grant has been a real bonus in contributing to Steven's salary. Retaining local talent in regional areas is crucial for the success of businesses like ours, and programs like this play a vital role in achieving that. Steven's internship is a great example of sustaining jobs in the region – allowing him to move closer to his family and apply his mechanical engineering qualifications locally, rather than having to relocate."

– Damien, Operations Manager, Brighann Ginning and Generation STEM Links supervisor

Systemic initiatives

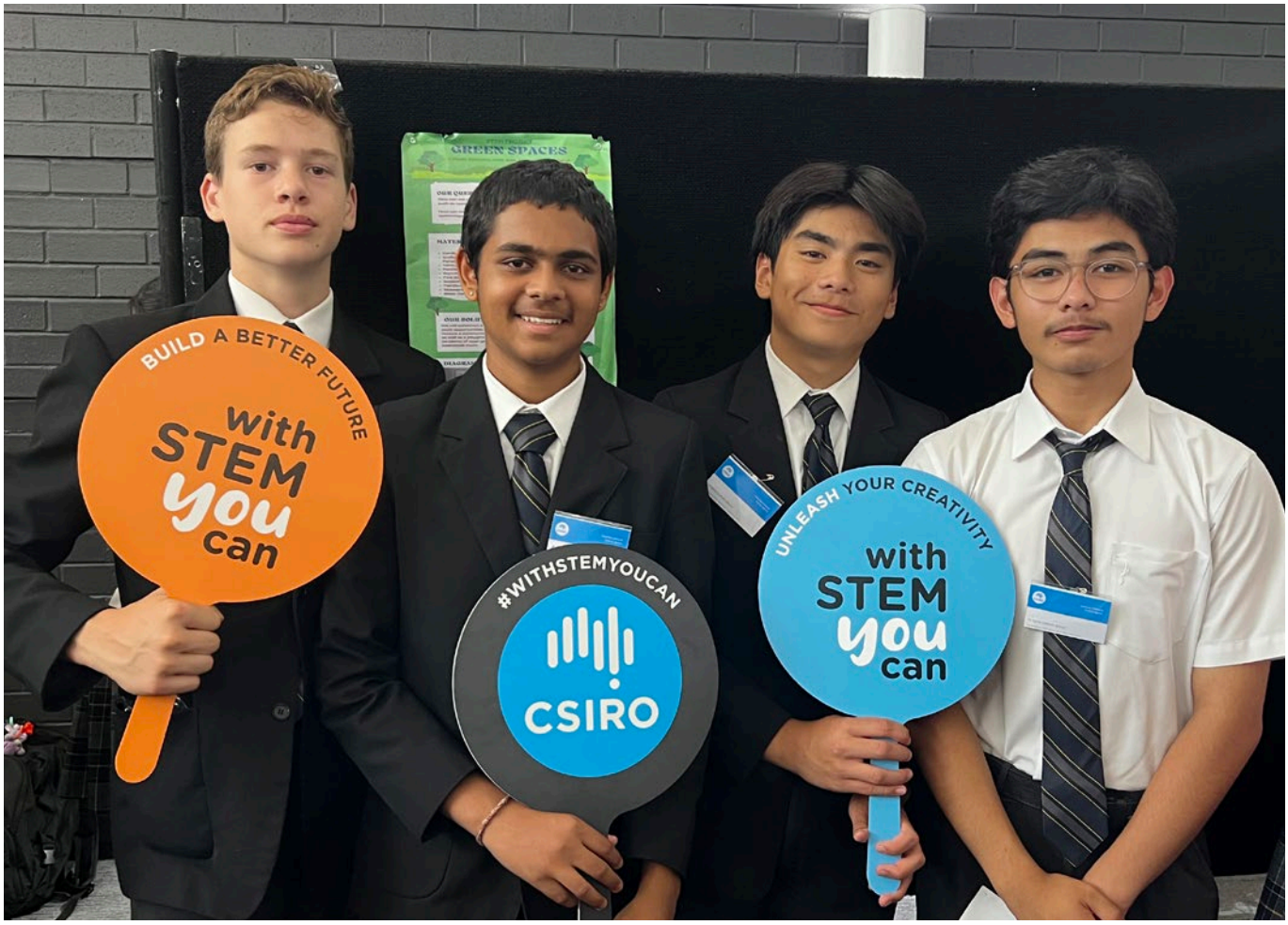
Generation STEM working towards systemic change

Various initiatives were launched in 2024 in line with systemic challenges outlined in Operational Plan 3.

Systemic initiative	What we've done	Where we are now	Where we're going
Advocating for evidence-based practices in STEM education	STEM-INSIGHTS launched. Engaged key stakeholders and audiences in a co-design process with Portable. Project focus narrowed and tailored through ON Prime.	Pre-implementation stage for two projects that STEM-INSIGHTS will deliver: • Capability Enhancer • Student Longitudinal Data System	Delivery of two pivotal projects that are poised to transform the landscape of STEM education programs.
Enhancing industry engagement and capability	Held two Industry breakfasts with approximately 150 attendees. Created a toolkit to support SMEs recruit interns. Increased awareness of benefits to industry in engaging with STEM education activities. Provided additional support to Mentor-Teacher partnerships.	Increased awareness of the benefits to industry in engaging with STEM education activities. Increased pool of STEM businesses and professionals participating in STEM education activities. 14 per cent increase of business offering multiple site visits in STEM CPP.	Establish foundations to support strong and collaborative STEM industry-education ecosystems, harnessing relationships with stakeholders such as Amazon and Australian Catholic University.
Addressing misconceptions of 'STEM'	Showcased more diverse industry sectors and careers in both Generation STEM Links and STEM CPP. Completed planning for bigger and better #With STEM You Can (WSYC) Campaign for 2025. CSIRO social post featuring #WithSTEMYouCan received 11,300 post engagements and 5900 click throughs.	92 per cent of Generation STEM Links interns are students from underrepresented groups. More low ICSEA[3] schools now participating in STEM CPP. Deadly in Generation STEM Teachers more confident in making links to their local community to represent Indigenous Knowledges in the classroom.	Leverage the #WSYC Campaign, with diversified platforms and content.
Engaging parents and families	Created tools and resources to support parents talking to their children about STEM. Revamped STEM CPP showcases to allow more parents to attend. Delivered parent session built into Deadly in Generation STEM camps. Underwent planning for a research project around 'what works' in parent engagement.	Over 200 parents attended showcases, a >250 per cent increase. Parent session at camps opened dialogue between parents and STEM education programs. Better understand of which community events are best to attend for maximum impact.	Create pool of evidence to support recommendations for best practice with engaging with parents and families about STEM education.

Tools and resources Leveraging communications Building sustainable relationships

3 Index of Community Socio-Educational Advantage is a scale that provides an indication of the socio-educational backgrounds of students. 1,000 denotes the median score, so schools with a score of less than 1,000 are in the bottom half of relative advantage.


BUILD A BETTER FUTURE
with STEM you can
#WITHSTEMYOUCAN
CSIRO
UNLEASH YOUR CREATIVITY
with STEM you can


Rooftop Garden

Advocating for evidence-based practices in STEM education: STEM-INSIGHTS

Project establishment

A STEM-INSIGHTS project plan has been developed and is continuing to be iterated as the project develops further and implementation begins. Project KPIs and milestones have been developed to track progress and ensure accountability. Recruitment took place in late 2024 to establish a project team, including specialist staff in user experience design, evaluation capability, data analysis, and implementation science.

In 2024, STEM-INSIGHTS undertook both external and internal development activities, described in 'Project Activities' below. From the extensive research and consultation work undertaken, and insights garnered through these activities, two projects were developed under the STEM-INSIGHTS initiative: Capability Enhancer and Student Longitudinal Data System.

Project activities

Portable co-design

CSIRO partnered with the design consultancy Portable (November 2023 to April 2024) to engage key stakeholders and audiences in a co-design process. The project sought to demonstrate evidence-based relationships between key STEM outcomes and potential interventions. A process was implemented to collectively design tools, methods, and/or services that would help improve STEM education outcomes and be widely utilised and impactful. From December 2023 to February 2024, an expression of interest process was undertaken for Evidence X (now called STEM-INSIGHTS) to garner engagement with STEM education ecosystem stakeholders. There was a total of 167 EOI respondents, with the dedicated web page receiving 1,156 web views. Portable activities resulted in 175 participant engagements (i.e. interviews, workshops, collaboration sessions, surveys, and validation sessions). As a result of this work, foundational documents, strategies and recommendations were created that paved the way for the work that took place in ON Prime.

ON Prime

Two staff members from STEM-INSIGHTS participated in ON Prime, a nine-week CSIRO accelerator program (April to July 2024) focussed on customer discovery, project clarity and impact planning. 112 customer conversations occurred from relevant market segments including students, educators, program delivery organisations, government, community and parents, industry, evidence and evaluation professionals and funders. From these conversations, the project focus was narrowed and tailored to meet the clear needs of the target audiences and to produce the greatest impact. Key insights included the 'pains' of assessing impact and navigating inconsistent data and feedback mechanisms. Stakeholder discussions (internal and external) highlighted the need for the project's re-brand, and after consultation, Evidence X became STEM-INSIGHTS.

Centre for Evidence and Implementation (CEI)

CEI is a social purpose organisation that helps generate, find, translate, use, and implement evidence. STEM-INSIGHTS sought the expertise of CEI to provide implementation advice and support to review all materials and plans for STEM-INSIGHTS before launching the two projects. A brief written report was provided to CSIRO at the end of December 2024 for consideration and provided endorsement of the approach and some recommended adjustments.

Pre-implementation activities

In late 2024, the two STEM-INSIGHTS projects entered a pre-implementation stage.

The Capability Enhancer project developed an expression of interest process (with tiered levels of involvement), resolved intellectual property issues, developed needs assessments and screening tools, and drafted collaboration agreements.

The Student Longitudinal Data System built on the Portable and ON Prime processes to further refine the vision and requirements of the project, in advance of detailed design and build work to occur in 2025.

Michael Winters – Bards Eye View, Courtesy of Cumberland City Council

Enhancing industry capability to engage in STEM education programs

Generation STEM hosted two *Educate to Innovate* industry breakfast events in Western Sydney, offering a valuable platform for businesses to collaborate and explore strategies for fostering lasting connections between industry and education. These events highlighted the critical need for ongoing capability building within industry and generated enthusiasm for creating opportunities to engage with young people and support a diverse talent pipeline.

The events also directly contributed to industry applications for Generation STEM Links, while strengthening relationships with organisations such as the Australian Catholic University (ACU), Thermo Fisher, and Western Parkland City Authority.

In 2024, Generation STEM developed new relationships, notably partnering with Amazon to redesign and implement a series of student immersion days, providing valuable insights and expertise to support Amazon's staff in planning and delivering a series of highly successful events that provide students with a real taste of what a career in STEM could look like. This fruitful collaboration has paved the way for Amazon to expand its commitment to STEM education by funding 30 site visits and the development of new educational materials in 2025.

Generation STEM Links also achieved a significant milestone this year with the completion of its industry toolkit. This resource, developed through industry education collaborations in 2023, provides businesses – particularly SMEs – with practical guidance on engaging and supporting tertiary student interns. Given that SMEs account for 84 per cent of all internships to date, the toolkit is expected to play a pivotal role in capacity building, complementing the program's highly regarded facilitation support during recruitment and placement.

Normalising and addressing misconceptions of "STEM"

The 2024 **#WithSTEMYouCan Careers Expo** showcased the diversity of STEM industries and career pathways, connecting 408 students with 25 industry exhibitors spanning aviation, manufacturing, water, energy, and higher education. Students had the chance to engage directly with STEM professionals, gaining valuable insights into the breadth of roles and opportunities within STEM fields.

In response to feedback from teachers and students in 2023, this year's expo introduced additional interactive workshops. These sessions, covering topics like environmental sustainability, data design, water management, and engineering, provided hands-on activities to spark curiosity and illustrate what a STEM career can look like in practice. The event concluded with a panel discussion featuring STEM professionals, emphasising the diverse and often non-linear paths a STEM career can take. Students were highly engaged throughout the event and expressed appreciation for these unique opportunities.

The **TAFE Taster Program** further expanded STEM career exploration, offering practical insights into potential pathways at three TAFE campuses. Through hands-on activities linked to STEM-related disciplines, students explored alternative routes into STEM careers. The program highlighted the skills and experiences available locally through TAFE, showcasing how vocational training can lead to rewarding STEM opportunities.

By blending training with practical, real-world activities, the TAFE Taster Program demonstrates an alternative, accessible pathway to a successful STEM career. Plans are underway to continue expanding the program to new Local Government Areas, providing even more students with opportunities to explore STEM pathways close to home.

"[The TAFE Taster program] was a really great and unique opportunity. Our teachers were great. Everyone was really helpful, and I recommend this experience to others like me!

...it provides opportunities and experiences to students, like myself, to explore new things and step out of [our] comfort zone to express our ideas and thoughts."

– Student attending TAFE Taster Program[4]

#WithSTEMYouCan Careers Expo survey findings

Students

At least half of respondents Strongly agreed they are **more confident about my ability to work or study in STEM** (54 per cent) and **more interested in learning about STEM** (50 per cent).

Teachers

Three quarters of respondents (75 per cent) reported that their **awareness of potential STEM careers greatly increased** from the Careers Expo.

"I found the booth on welding careers very interesting, as I was taught about all the different parts and components, and that it isn't just sticking two pieces of metal together. It was interesting to me because I got to see all the different careers there are in welding also." – Student attending #WYSC Career Expo[4]

4 Quotes taken from: O'Brien, Mearon. STEM Community Partnerships Program Insights: 2024. Unpublished; 2025.

Parent and family engagement

Generation STEM strengthened its engagement with parents and families, recognising their vital role as key influencers in students' subject choices and career decisions. Both the STEM Community Partnerships Program (STEM CPP) and Deadly in Generation STEM programs integrated parent-focused sessions into their activities, including the design and testing of a dedicated session at the start of the Illawarra Deadly in Generation STEM camp.

The student showcases within STEM CPP were also redesigned to better accommodate parents and guardians, resulting in a remarkable **250 per cent increase in attendance, with over 270 parents and guardians participating.**

Building on the success of 2023, Generation STEM redesigned activities for community events such as the Australian Botanic Garden Mount Annan Community Day and parent information sessions Parramatta Library. The additional resources were developed to ensure more meaningful conversations with parents, and are designed for reuse, ensuring a lasting impact and contributing to Generation STEM's enduring legacy.

The team has gathered valuable insights into the most effective events and strategies for engaging parents. This growing understanding has informed the planning of a dedicated action research project on parent engagement, set to launch in 2025.

Building a legacy

In 2024, Generation STEM made significant progress in building a lasting legacy. Strong, sustainable partnerships were established with key stakeholders in the STEM ecosystem, including Australian Catholic University and Amazon. The alignment of strategic goals between these organisations and Generation STEM ensures that the initiative's impact will continue, carried forward by these collaborators even after Generation STEM concludes... The early signs of success are evident by both these organisations financially contributing to the #WithSTEMYouCan Careers Expo.

At program level, STEM CPP, now its sixth year, continues to thrive. While the number of participating schools remains steady, the student cohort has grown by 26 per cent compared to 2023. Additionally, more teachers are delivering the program across various faculties and year groups, signalling the embedding of a STEM culture within schools. These developments contribute to the program's durability beyond Generation STEM's funding period.

Additional support was provided for teachers to connect with local Aboriginal communities through Deadly in Generation STEM, with teachers reporting increased confidence and a deeper understanding of how to build these relationships in a respectful and sustainable manner. The process review for mentor-teacher partnerships in STEM CPP also led to an increase in successful collaborations. Over time, these relationships will require less facilitation from the Generation STEM team. The current efforts to solidify these connections lay a strong foundation, significantly increasing the likelihood of their continuation in the future.

Drawing from valuable teacher feedback, both Deadly in Generation STEM and STEM CPP have revamped their professional learning programs and resources to better support the integration of the initiatives within schools.

This ongoing focus on embedding the programs has led to greater engagement from teachers within each participating school, fostering more peer-to-peer support and reducing dependence on the Generation STEM team. This shift is crucial for ensuring the sustainability and long-term impact of the programs and these efforts will play a central role in shaping Generation STEM's legacy resources.

Furthermore, Generation STEM Links developed a comprehensive toolkit to assist Small to Medium Enterprises (SMEs) in recruiting student interns – a resource that will continue to provide value well beyond the program's duration.

Generation STEM Links: A scalable and replicable model

A cornerstone of Generation STEM Links' legacy lies in its replicable and scalable model. Its outcomes and insights can be extended to other states and territories or adapted to create tailored, industry-specific facilitated internship programs.

The program's influence is already evident. In 2024, CSIRO launched the Western Australia Food Industry Education Collaboration Program, a new initiative operating within WA's food and beverage sector. Drawing directly from the Generation STEM Links framework, this program supports businesses in recruiting WA undergraduates, postgraduates, and international students, aiming to replicate the high-quality results and retention rates of the original model.

This example underscores the adaptability and impact of the Generation STEM Links model. By leveraging its distinctive features, proven outcomes, and CSIRO's expertise, this model can be tailored for diverse industry sectors and regions. The result is a blueprint for high-quality internship programs that address specific workforce needs, foster talent development, and drive measurable, lasting impact.

Program management

Governance

The Generation STEM Consultative Council was appointed in April 2018.

The current membership is (as of 31 December 2024):

- Dr Ian Oppermann, Co-founder ServiceGen; Industry Professor, University of Technology Sydney
- Ms Elanor Huntington, Executive Director, CSIRO Digital, National Facilities and Collections
- Ms Gail Fulton, Director, CSIRO Science Connect
- Ms Gabrielle Trainor AO, Chair of the Construction Industry Culture Taskforce
- Mr Martin Graham, Deputy Secretary of Teaching, Learning and Student Wellbeing, NSW Department of Education.

Appendices

This section details the characteristics of the student/schools that participated in Generation STEM in 2024.

STEM Community Partnerships Program

Number of students participated by year

	Year 7	Year 8	Year 9	Year 10	Total
2019–20	n/a	n/a	358	91	449
2021	n/a	n/a	757	365	1122
2022	n/a	n/a	1171	1150	2321
2023	278	818	1407	1136	3639
2024	670	1113	1560	1251	4594
Percentage change in 2024	**+141 per cent**	**+36 per cent**	**+11 per cent**	**+10 per cent**	**+26 per cent**

Number of schools participated by sector and year

	Government	Catholic	Independent	Total
2019–20	15	1	6	22
2021	27	12	8	47
2022	43	19	16	78
2023	44	22	19	85
2024	46	20	20	86
Percentage change in 2024	**+5 per cent**	**-9 per cent**	**+5 per cent**	**+1 per cent**

Number of schools participated by LGA/region and sector

	Government	Catholic	Independent	Total
Albury	0	0	2	2
Blacktown	3	2	2	7
Blue Mountains	1	0	1	2
Camden	3	0	1	4
Campbelltown	4	0	2	6
Canterbury Bankstown	7	2	1	10
Cumberland	4	1	2	7
Central Coast	1	2	2	5
Central West	1	2	0	3
Dubbo	1	0	1	2
Fairfield	2	2	0	4
Hawkesbury	1	0	0	1
Liverpool	3	3	2	8
Parramatta	3	2	0	5
Penrith	6	2	2	10
Queanbeyan	2	0	1	3
The Hills Shire	2	2	1	5
Wollondilly	1	0	0	1
Yass Valley	1	0	0	1
Total	**46**	**20**	**20**	**86**

Deadly in Generation STEM

Number of participants by region

	Illawarra	Moree	Total
Students	16	10	26
Teachers and teachers support staff	45	18	63

Generation STEM Links

	2023	2024	Percentage change in 2024
Number of placements confirmed*	62	80	**+29 per cent**
Number of placements completed^	40	68	**+70 per cent**
Number of placement requests	103	112	**+9 per cent**
Number of new industry collaborators applied	43	40	-7 per cent
Number of student applications	709	1,971	**+178 per cent**
Percentage of student interns from underrepresented groups placed	97	89	-8 per cent

*Placement confirmed indicates the internship contract was signed in the reporting year. The internship may start the next year.

^placement completed indicates that the internship finished in the reporting year. The internship may have started in the previous year.

As Australia's national science agency, CSIRO is solving the greatest challenges through innovative science and technology.

CSIRO. Creating a better future for everyone.

Contact us
1300 363 400
csiro.au/contact
csiro.au

For further information
csiro.au/generationSTEM

B&M | 25-00015