



Australia's National
Science Agency



Indigenous STEM Education Project

The BHP Foundation has funded the Indigenous STEM Education Project since 2014. The Project aims to increase participation and achievement of Aboriginal and Torres Strait Islander students in science, technology, engineering and mathematics (STEM) education and career pathways.

The latest Monitoring and Evaluation Report is demonstrating that the Indigenous STEM Education Project is having an impact of the engagement and achievement of Aboriginal and Torres Strait Islander students.

Now in the final year of BHP Foundation funding, this successful pilot Project has an opportunity to be taken to scale through other funders.

74%

of ASSETS participants intend to have a career in STEM after participating in the summer school.

66%

of Aboriginal and Torres Strait Islander students achieved an A, B or C grade after participating in the inquiry provided by the Inquiry for Indigenous Science Students (I2S2) program.

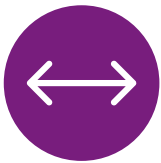
Engagement

of Elders and Rangers with the on-country Science Pathways activities and transferring Traditional Ecological Knowledge across multiple generations.

Science Pathways for Indigenous Communities

Supports remote Indigenous communities and schools to improve STEM education outcomes.

DELIVERY MODEL



Support to selected western and central desert community schools to develop and deliver integrated Two-way science teaching and learning programs.



Engagement with Indigenous teachers and Elders to identify the skills and knowledge required for their children to look after Country.



Training and resources to teachers to link Indigenous ecological knowledge with Western science and the Australian Curriculum.

OUTCOMES

Partnerships

formed between schools and Indigenous Ranger programs, scientists and land management organisations in delivering Two-way science.

Support

from Aboriginal people in schools and communities in the planning of learning programs with teachers.

ACHIEVEMENTS



YEAR 1
2014–15

Program initiation and planning



YEAR 2
2015–16

7 Communities

6 Schools

15 Teachers

20 Teacher-assistants

255 Indigenous Students



YEAR 3
2016–17

12 Communities

10 Schools

45 Teachers

60 Teacher-assistants

547 Indigenous Students



YEAR 4
2017–18

11 Communities

9 Schools

34 Teachers

35 Teacher-assistants

662 Indigenous Students

Three Indigenous STEM Award Winners



YEAR 5
2018–19

11 Communities

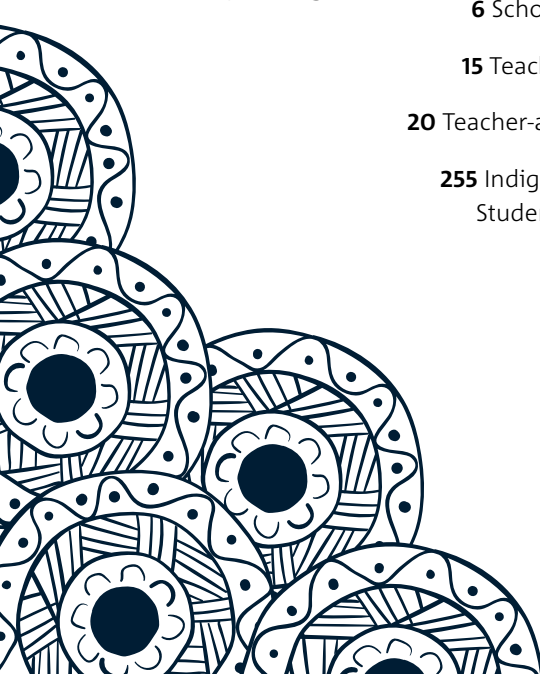
9 Schools

42 Teachers

36 Teacher-assistants

516 Indigenous Students

Areyonga School **won** the Indigenous STEM Education School Award 2018/2019





CASE STUDY

Wiluna Remote Community School

Wiluna Remote Community School is a school in the Goldfields region of Western Australia on the edge of the Western Desert. The school identified a need to create a learning program to maximise the unique cultural background of students and their families. The Science Pathways for Indigenous Communities program has been working with the school since 2016 to develop this concept into an integrated Two-way science learning program.

In the adult learning program, Science Pathways for Indigenous Communities coordinators facilitate trips on On Country with teachers and Elders to give teachers context of local culture and Martu ecological knowledge. Teachers and Elders work together to connect Martu knowledge to the Western Australian Curriculum and design Two-way science inquiry activities.

In the student learning program, students go On Country with Martu Elders and undertake hands-on cultural and science activities. The program is connected to learning before and afterwards in the classroom. This method of On Country inquiry based learning has seen increased

attendance and engagement with students as well as stronger relationships between the community and the school which is crucial to the success of students.

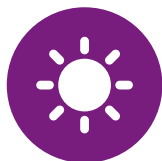
Using the traditional knowledge model provided by the Science Pathways for Indigenous Communities program, the school also took over the former TAFE site in 2017 and repurposed it as a Training Centre. This facility allows upper secondary students to work with Martu Rangers to facilitate intergenerational transfer of knowledge through Certificate I and II that correspond to On Country oriented employment. This multi-generational training program, has seen an increase in attendance, engagement and achievement in school students who previously were disengaged from schooling.

The method of On Country inquiry based learning has seen increased attendance and engagement with students.

Aboriginal Summer School for Excellence in Technology and Science (ASSETS)

Provides opportunities for high-achieving Aboriginal and Torres Strait Islander Year 10 students to explore available STEM study and career options.

DELIVERY MODEL



Annual nine-day residential summer schools incorporating cultural, academic and personal development strands.



Partnerships with universities and research organisations providing students with exposure to cutting-edge research and technology.



Alumni support including opportunity to participate in the CSIRO CREST Awards and work placements.

OUTCOMES

79% intend to study a STEM field at university (up from 58% before the summer school)

100% have a good understanding of STEM careers (up from 64% before the summer school)

74% intend to have a STEM career (up from 51% before the summer school)

ACHIEVEMENTS

YEAR 1
2015

1 Summer School

28 Indigenous students

Leadership & support program launched

YEAR 2
2016

3 Summer Schools

98 Indigenous students

YEAR 3
2017

3 Summer Schools

101 Indigenous students

11 Student Work placements

2 Indigenous STEM Award Winners

YEAR 4
2018

3 Summer Schools

104 Indigenous students

24 Student Work placements

2 Indigenous STEM Award Winners

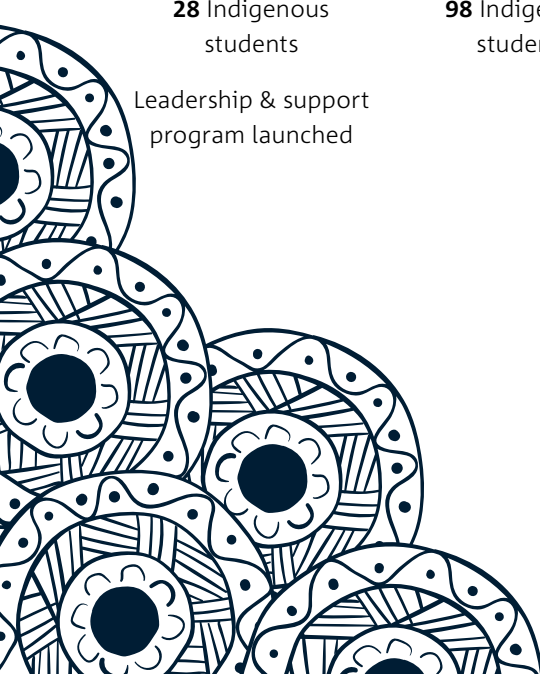
YEAR 5
2019

3 Summer Schools

99 Indigenous students

22 Student Work placements

1 Indigenous STEM Award Winners





CASE STUDIES

Grace Kalinin attended the Aboriginal Summer School for Excellence in Technology and Science (ASSETS) in 2015. After attending the summer school, she became more interested in science and changed her Year 11 and 12 subjects to include Physics. She also used the mentors she connected with at ASSETS to assist her in applying for internships and work placements. She is currently studying Food and Agribusiness at the University of Sydney and is a research technician with the CSIRO Agriculture and Food team, as part of the CSIRO Cadetship program.

Wayne Cawthorne attended the Aboriginal Summer School for Excellence in Technology and Science (ASSETS) in 2016 while he was a student at Townsville State High School. This experience allowed him to explore his love of science and the variety of study and career options he could pursue outside of school. He participated in the ASSETS work placement program in Years 11 and 12, working with a post-doctoral research fellow at James Cook University on chytridiomycosis in frogs, a medical practitioner in Townsville and GHD Australia. It was these experiences that spurred him on to pursue medical research as a career path. He is currently studying a Bachelor of Advanced Science, cell and molecular biology and chemistry at James Cook University and doing an internship with The Walter and Eliza Hall Institute for Medical Research.

Inquiry for Indigenous Science Students (I2S2)

Provides opportunities for Aboriginal and Torres Strait Islander students in Years 5-9 in metropolitan and regional schools to increase engagement and achievement in science.

DELIVERY MODEL



Development of Indigenous themed, hands-on science inquiry resources for teachers and schools.



Professional development and support for teachers to increase capacity to deliver inquiry-based activities and resources.



Recognition of the enduring relationship that Aboriginal and Torres Strait Islander peoples have with science underpins the development of resources and teacher professional development.

OUTCOMES

27% of students recorded an increase in academic achievement following participating in I2S2 inquiry

66% achieved an A, B, C grade after participating in I2S2 inquiry

89% showed improvement or similar engagement after participating in I2S2 inquiry

ACHIEVEMENTS



YEAR 1
2015

6 Clusters, 14 Schools

40 Teachers

204 Indigenous students



YEAR 2
2016

6 Clusters, 45 Schools

156 Teachers

2,312 Indigenous students



YEAR 3
2017

15 Clusters, 75 Schools

275 Teachers

2,895 Indigenous students

3 Indigenous STEM Award Winners



YEAR 4
2018

15 Clusters, 73 Schools

333 Teachers

2,969 Indigenous students

1 Indigenous STEM Award Winner



YEAR 5
2019

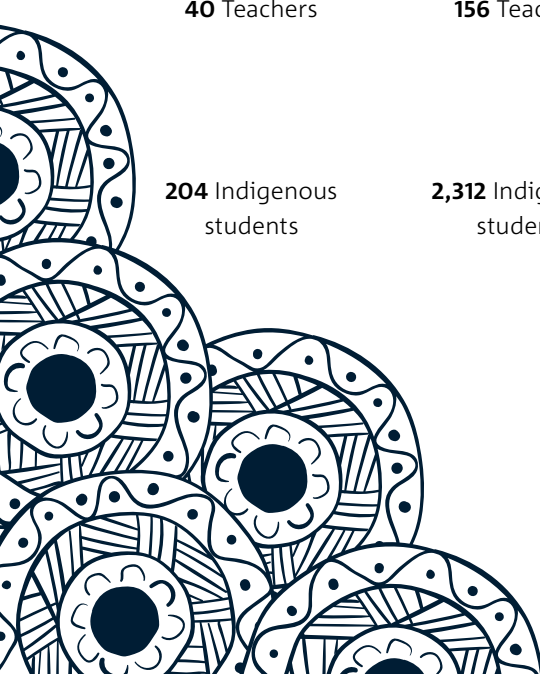
15 Clusters, 72 Schools

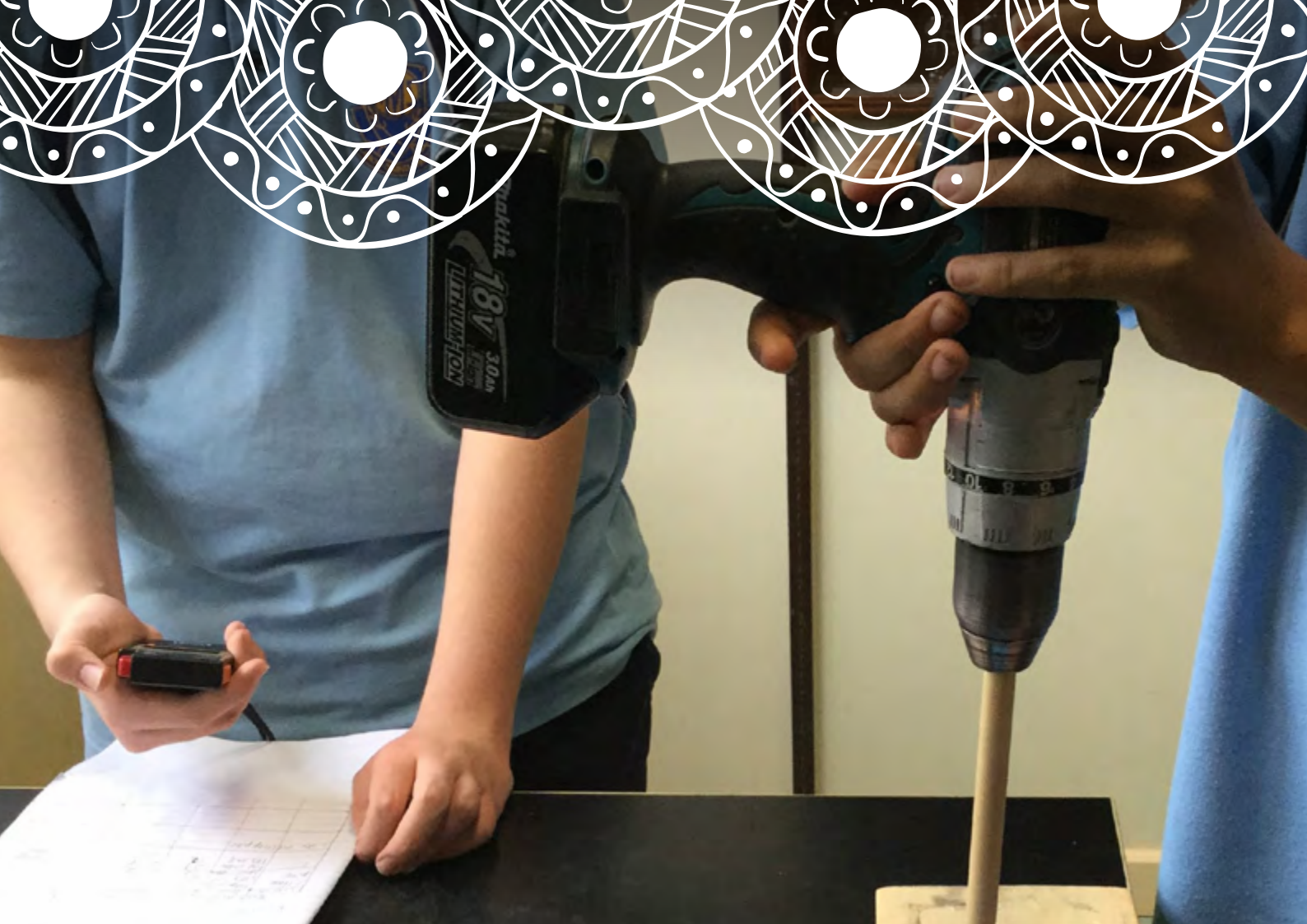
317 Teachers

172 Teachers using Online Learning Environment

3,549 Indigenous students

1 Indigenous STEM Award Winner





CASE STUDY

Glenala State High School

Glenala State High School is a secondary school in South West Brisbane. Students come from a variety of backgrounds with different values towards education. Almost 23% of students at Glenala State High School identify as Aboriginal and/or Torres Strait Islander.

Teachers identified the need for further training in engaging Aboriginal and Torres Strait Islander students in science. Participating in the program since 2016, one of the immediate results the school saw was students who had previously not submitted work had become actively engaged with the content, handing in work which showed critical thinking.

Teachers actively started using the resources and engaging with both the science and cultural components of inquiries. Teachers used the Dandiiri Schools and Community Library to get resources such as videos on starting fire and fish traps as well as having spears and woomeras for students to examine and handle. Many of the teachers had previously not known the library existed until the I2S2 program.

Adopting I2S2 has seen Glenala State High School incorporate Indigenous perspectives into other science subjects including Year 11 and 12 subjects.

Students who previously hadn't engaged with science before the I2S2 have chosen to study science subjects at a senior school level.

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