Evaluating I2S2 (Inquiry for Indigenous Science Students) 
An inquiry-based Indigenous Science Program for Years 5 to 9
Indigenous STEM Education Project

ACKNOWLEDGEMENT OF COUNTRY
The Indigenous STEM Education Project team acknowledges the Traditional Owners of the lands on which this Project operates and their vibrant living cultures and knowledge systems. We pay our respects to Elders past and present and thank all community members who are providing the leadership to ensure meaningful and effective engagement with Aboriginal and Torres Strait Islander communities for the six distinct but complementary STEM education programs that make up this Project.

WHAT IS I2S2?
I2S2 – or Inquiry for Indigenous Science Students – uses hands-on inquiry-based projects in an Indigenous context to increase student engagement and achievement in science. I2S2 draws on best practice in inquiry-based science education and Indigenous science education to support teachers to implement the Australian Curriculum. The program is aimed at students in Years 5 to 9 and involves multimodal delivery, assessment procedures and practical learning experiences, such as What’s Cooking (chemical sciences), Throw it Far (physical sciences), and Burn and Grow (biological sciences). The assessment techniques allow all students to demonstrate their higher order thinking skills in diverse modalities.

CSIRO I2S2 Coordinators work with schools to train and support science teachers in their delivery of authentic learning inquiries, and deepen their understandings about broader Aboriginal and Torres Strait Islander cultural considerations. Over 7600 Aboriginal and Torres Strait Islander students and 1754 teachers have been involved with I2S2 since 2016.

WHY THIS APPROACH?
Research indicates that students achieve better learning outcomes in school – that is, they are more engaged, achieve higher academic results and have improved attendance levels – when they are active learners in contexts that are authentic and related to their everyday lives (Savigny, 2014). For Aboriginal and Torres Strait Islander students, drawing on both Indigenous and Western knowledges has been shown to improve learning outcomes and is particularly relevant for STEM subject areas (Throsby & Petetskaya, 2016). I2S2 provides teachers and students with the tools to embed Aboriginal and Torres Strait Islander perspectives into the Australian science curriculum, offering a unique mix of science and cultural learning opportunities. The I2S2 program resources were designed to be adaptable to varying classroom pedagogies and student groups, enabling teachers to adjust the program according to their local context and make learning more engaging.

Teacher: ‘I noticed a huge change in engagement, purely because I think it [the inquiry] was relevant to them, so they were engaged in the content and just the whole inquiry process – a definite improvement in engagement’.

Student: ‘I2S2 inquiry was a lot more fun, a lot more hands-on. We got more fresh air and not being cooped up… so when you come to science, you’re not going to be bored and going, “Oh, it’s science again.” You get to use something you learn and you get a bit excited for it.’

DISCUSSION
Findings indicate that I2S2 is having a substantial positive impact on participants, principally in terms of academic achievement and engagement.

RESULTS
Academic results
38% of Aboriginal and Torres Strait Islander students improved their results after participating in the inquiries; and 66% of Aboriginal and Torres Strait Islander students achieved an A, B or C grade after inquiry lessons (up from 49%). The proportion of students assessed as D or E decreased from 51% to 35%. The data suggests that the program is also providing benefits for non-Indigenous students, with 68% of non-Indigenous students at the D or E level improving their academic results after the inquiries.

Student engagement
The overall engagement of Aboriginal and Torres Strait Islander students increased. For example, 84% improved or displayed similar levels of engagement after the inquiry. Engagement of non-Indigenous students also increased with 89% improving or maintaining engagement levels.

Attendance
Student attendance in I2S2 classrooms was measured, however no apparent positive influence on student attendance was observed. Taking into consideration that I2S2 inquiry lessons constitute only a relatively small portion of total class time over a year, and the potential influence of a range of factors on attendance not related to curriculum and activities, this indicator may not provide the most robust measure of I2S2 success.

FURTHER INFORMATION
Caja Gilbert
e caja.gilbert@csiro.au
w www.csiro.au/education

The Indigenous STEM Education Project, funded by BHP Foundation and delivered by CSIRO, aims to increase participation and achievement of Aboriginal and Torres Strait Islander students in science, technology, engineering and mathematics (STEM) education and improve career pathways. It consists of six programs that cater to the diversity of students as they progress through primary, secondary and tertiary education and into employment.

References: