

# Eyes Wide Open

## Pennant Hills Public School: SPECTRA Science Open Day



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### Many exciting lightbulb moments The SPECTRA Program at our school

**WARNING:** The following report contains whirligigs, volcanic eruptions, fake snot, pooters and pint-sized problem solvers.

"Students studying science and technology are encouraged to question and seek solutions to problems through collaboration, investigation, critical thinking and creative problem-solving. Students are provided with opportunities to apply thinking skills and develop an appreciation of the processes they can apply as they encounter problems, unfamiliar information and new ideas. These attributes are fundamental to the development of students who use evidence to make decisions and solve problems."  
(Science and Technology Rationale, NES)

The SPECTRA program was introduced to Pennant Hills Public School as an extracurricular activity to help support the science and technology discipline, and more broadly STEM connections, for students in Stage 3. There are currently 35 students of mixed ability completing the program. Throughout their involvement in the SPECTRA program, these students are encouraged to embrace new ideas by means of authentic, open-ended learning experiences, which include researching, testing, observing, trialling and refining ideas.

Students meet weekly at lunchtime to present projects, review concepts and provide useful feedback. During these collaborative discussions, many exciting lightbulb moments occur. Students are challenged to expand their thinking or change their approach altogether as they support one another along the journey of scientific discovery.

In addition to these face-to-face meetings, we have set up a Google Classroom, initially with the goal of improving communication and providing a safe, paperless method for returning and storing assignments. However, this online 'classroom' has quickly expanded to become a platform for students to continue their scientific discussions online in a non-confronting way.

### **The Teacher has a lightbulb moment. Expanding SPECTRA's reach beyond the classroom**

Toward the end of term 1, it occurred to me that the skills and knowledge being gleaned by our SPECTRA participants ought to be shared. I began thinking about ways the students could showcase their newly acquired knowledge and expertise and extend SPECTRA's reach beyond our lunchtime meetings. It was at this point that I proposed the idea of organising a SPECTRA Science Open Day to coincide with National Science Week with the goal of promoting STEM learning across the school. The response from both the school executive and the SPECTRA students themselves was overwhelmingly supportive.

At our very next SPECTRA meeting, we began preparations and discussed the importance of an effective presentation. Our target audience had suddenly transformed from 35 keen Stage 3 SPECTRA scientists to a much wider K–6 cohort. The students came to understand that passing on scientific knowledge was only one part of the process of building a successful presentation.

We posed the question: How can we communicate our scientific knowledge and skills in an effective, engaging and stimulating way that takes into consideration our K–6 audience?

We brainstormed creative solutions, including:

- Slideshows using slide presentation software;
- Video presentations;
- Procedural texts;
- Information reports to explain the science behind the practice;
- Graphing tools to present data;
- Hands-on activities to provide direct practical experience; and
- Live demonstrations.

Then we considered how we could accurately deliver meaning without baffling our audience with confusing scientific jargon. To do this, students had to think critically about their SPECTRA projects in view of the language required (both verbal and written) to adequately explain their findings as well as the science behind these findings.

There really is no greater test of a student's understanding than calling upon them to teach other students what they have learned. As a result, I watched as literacy and science overlapped seamlessly, helping develop competencies in both learning areas. Our committed and capable SPECTRA 'scientists' went away to consider their topics and begin preparations.

In the meantime, I invited our local high school, Pennant Hills High School, to partner with us on the showcase event. The proposal was met with great enthusiasm. Before I knew it, Stage 5 students, under the supervision of Melodie Frida (head teacher: science), were tasked with the responsibility of choosing and building an appropriate science or STEM-based display to accompany our Stage 3 exhibits.

Over the next three months, what had begun as a small idea started to take shape, all the while growing and evolving. With the school hall booked, tables and chairs set up, risk assessment completed, and exhibits ready, it was finally time to unveil our first-ever SPECTRA Science Open Day. Excitement among the students was palpable.

## Countless more lightbulb moments SPECTRA Science Open Day

With over 40 stalls, the displays were as varied and interesting as the students themselves. Whether it was trying your hand at soil testing or coming to grips with the science of biodiversity or blushing, there was something for everyone. We had rockets on standby, a whirligig at the ready, volcanoes erupting, lava lamps to astound and electrical circuits to thrill. Some went crazy for oobleck, while others tried their hand at construction or were completely blindsided by the optical illusions. We even managed to fit the entire Solar System inside our school hall. In fact, it was with considerable difficulty that teachers extracted their classes from the event.

I watched with great pride as the SPECTRA students interacted with our wider school community, competently answering questions and delivering STEM learning in a meaningful and engaging way. With mouths agape and eyes wide open in awe, it was clear that our visitors were experiencing countless more lightbulb moments.

In the end, our SPECTRA Science Open Day was an enormous success, providing our dedicated SPECTRA students with an opportunity to showcase their love of all things scientific by sharing their expertise and insights. The collaboration with our local feeder high school further enriched the experience and has cultivated improved school connections, which we hope to further nurture and develop in the future.

The ultimate goal of this event was to support and promote STEM learning across the school. Did we achieve this goal? To answer this, I will leave it to Pennant Hills Public School's principal and a parent from our school community to provide their insights.

"The hall was a buzz of excitement and exploration. All the students were engaged in the variety of science activities. The work of Mrs Macnaughtan and the SPECTRA students was outstanding and it was obvious the passion each of them has for Science. It was wonderful to see our local high school, Pennant Hills High School, involved in the day. I can't wait to see the next year's SPECTRA Science Open Day." (Matt

Pinchbeck, principal, Pennant Hills Public School)

"My daughter is always busy doing SPECTRA, talking to me about it, and has been prioritising it above all other schoolwork this year. I think it really appeals to her like of open-ended projects, and is a great preparation for high school and life. She is the type of learner that prefers to dive deeply into one topic, rather than doing a little bit about many topics. The work that she presents to the SPECTRA meetings and at the SPECTRA Open Day last week, is just the tip of the iceberg to the amount of reading, research, thinking and discussions that have been going on at home. She is sometimes shy in these contexts at school and does not talk very much about all the ideas and knowledge she has, but her discussions at home have been very interesting." (Jillian Taylor, parent of SPECTRA student)

### Background:

Rebecca Macnaughtan is a Grade 6 teacher who has supervised the running of the SPECTRA program at two schools in Sydney's northern suburbs. She is currently coordinator of the program at Pennant Hills Public School.