



*From left to right: Josh Watson, Elizabeth Reid,
Justin Reich, Shayla Wood and Sharon Livingstone.*

Local Engineers

LEADING THE WAY



Brooke Willoughby, Jemima Reid, Hamish Edwards, Nicholas Tuckey and Isaac Flett with their entry.

Teaching and inspiring aren't normally part of an engineer's job description. But every year the Transpower Neighbourhood Engineers Awards give engineers of every description, from all around the country, the chance to do both.

The awards, administered by the Institution of Professional Engineers (IPENZ), link engineers with individual or groups of school children to mentor them as they conceive and execute a project in their school or community.

For civil engineer Justin Reid MIPENZ, the programme has meant spending a portion of the 2009 year working with two groups at Otatara School in Invercargill as they solved a rainwater problem and rebuilt a school playground fixture.

Mr Reid, a Member of IPENZ and on the school's board of trustees, built an outdoor chessboard with the children of the school for an earlier Neighbourhood Engineers Award entry.

This year, he was asked by new Principal Sharon Livingstone to take two groups, one of Year 4 and the other of Year 6 children.

The younger group went on to win this year's Junior award for their water-supply upgrade project, which started with a suggestion by the children that they would like to solve the problem of balls getting stuck on the school roof.

Mr Reid notes that he started each project by explaining what engineers do, focusing particularly on their problem-solving abilities.

Brainstorming took the group of five children about a month, using their maths skills to set criteria and apply weightings to

select the problem they would most like to solve from among those on offer.

Talking about balls getting stuck in the spouting led on to what the spouting was used for – collecting drinking water – and the fact that the school had previously had to boil its water after failing a water test because of contaminants in the gutters.

“We learned about what makes our drinking water dirty, such as possums on the roof, and leaves, and started talking about barriers to protect the water supply,” says Mr Reid.

The children arranged for suppliers to visit and demonstrate the various products available on the market to solve the problem. Then they asked several to install test equipment on the school roof.

The children monitored and recorded the results over time, something nine-year-old Nick Tuckey says was his favourite part of the project. “It wasn't that hard and it was fun.”

After collating their results, the team brainstormed the pros and cons of the various solutions, and made a recommendation to the board of trustees.

The school's senior engineering group used their project time to solve a problem the school's parents had been grappling with. Mr Reid says that the first idea to be trialled was a cricket net for the school. Eventually the plan for a fully enclosed cricket pitch had to be abandoned because of costs, so the children turned their attention to repairing a wooden boat in the playground, which was disintegrating.

The school's parents had been looking at possibilities for using the boat, but no agreement had been reached about the best way forward.

Designing, drawing plans and quantity surveying were among the tasks the children took on as they completed the project. The result was a playground fixture that is proving immensely popular with their classmates.

Mr Reid says that both groups learnt a great deal about teamwork in the process, as well as actual engineering skills, such as how to test and monitor properly. The tasks required a good deal of discipline.

“We set out roles for the children – team leader, photographer, note-taker etc – and I set tasks for them to accomplish each week before I returned,” says Mr Reid.

Principal Sharon Livingstone says the awards are of huge benefit to the students, linking problem-solving with real-life practice and skills.

“It gives them a real, purposeful, authentic learning experience. In the process they use numeracy, literacy and lovely oral language in a practical way.

“We will absolutely be doing it again,” she says.

For Mr Reid, the opportunity to show children what engineers do, exposing them to the thinking, creativity and problem-solving skills needed, was the most rewarding aspect of the projects.

“While it's not without its ups and downs, and it can be frustrating, when you see the benefits to the children, it's well worth it.”

He says he was surprised at the level of lateral thinking the children were capable of, which was perhaps due to their lack of preconceptions. He also enjoyed getting recognition for his

profession: “Engineers are not good at presenting and selling themselves. In my view, this project promotes interest and respect for the profession”.

Awards Co-ordinator, Fay Duncan, says that is precisely the aim of the awards, which were started in 2003 to raise the profile of engineers.

She says that engineers, as they mentor projects and exemplify best technological practice, become role models to kids – “They show them engineers are cool people.

“We want to show children engineering is a highly transportable, highly exciting career. They get to test things, blow things up and solve problems.”

Each year Mrs Duncan sends out letters and brochures to every school in the country, from primary to secondary. Schools respond with letters of intention to take part, putting forward ideas ranging from installing a sunshade to redesigning the swampy corner of a school.

Winning projects in the 2009 entries included one from a 10-year-old girl who wanted to make her mother’s life easier by saving her tramping up a hill behind the house with food and water in buckets for the animals.

She designed a cart for her mum to push, after considering such things as how high the sides would need to be to enable the buckets to be lifted on easily, and what colour it should be painted to least scare the deer.

A secondary-school boy designed a temperature-controlled window mechanism after he found himself wishing the windows would open automatically when classrooms became too hot.

The awards, which Mrs Duncan likens to the engineering version of the traditional school science fair, rely on engineers in the community volunteering their time to mentor the students involved. Finding engineers can sometimes be a lengthy task, and she approaches everyone from IPENZ Branch chairs to individual companies in her search for volunteers.

“I think it’s a win-win situation. The mentors get quite a bit back out of the process,” she says.

Engineer Veronica Maka GIPENZ, who worked with the children of Auckland’s Pointview Primary School to build a water wheel, says she loved the work.

“These kids taught me there was no physical limit to the way a child thinks, and that I often underestimated how creative and intelligent they were.

“Creativity was the key”, she laughed, “An engineer was supposed to work out how you could get water to go down a tube, change colour and make music at the same time!

“As engineers we advised on what was feasible, practical and possible. However, by no means were we there to directly tell them it was impossible. We felt it was important that these students reach these conclusions on their own, and determine why certain design concepts or ideas could not be carried out.”

For the 2010 awards, 22 schools are already planning on taking part, with plenty more to come, and each will need the help of one or more engineers.

Feeling inspired? Mrs Duncan will be glad to hear from you – as will budding engineers at schools across the country. ■

WRITER Fiona Clarkson

Pupils at Hukanui School mix ingredients to make bricks for their project.

