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Mathematics entrepreneurs Eddie Woo and Adam Spencer brought a bit of razzle dazzle to the subject at a one-off course for stage 6 high school students and their teachers in November.

More than 150 students and teachers, from Sydney and the Illawarra, tackled the numbers game, with the pair presenting maths in a light that rarely shines on a subject that people either love or hate, get it or don't.

"I would define mathematics as play, as exploration and a story, one of the finest humanity has ever come up with," Mr Woo, whose Wootube channel has more 106,000 subscribers around the world, said.



"Mathematics, if you see it right, is just like play. For teachers, next time you're planning a lesson, just think about how much play is there in the lesson. I would suggest play is a very good match with mathematics."

He then explained a version of the old-school, back-of-class favourite, the "boxes" game, but with a twist (see graphic). He calls it "mean boxes". The usual dot grid has random numbers inserted within each square, and when a player forms a box they are awarded the number it encloses. At the end, the player with the highest mean wins. Students learn how to calculate a mean in a fun way. A basic grid, without numbers, can be found in the worksheet section on his Wootube website.

Spencer brought his usual comedic and pared-back take on the subject, as well as his new book *The Number Games*, of which all attendees received a signed copy with registration.

Australia's funniest and most famous geek put the students and teachers through their paces with exercises taken from his book, which carries the subtitle *Numbers. Trivia. Puzzles. Fun!* and a tribute from Russell Crowe that says: "When Adam Spencer gets his geek on, it's a joy to behold."

Spencer admitted he has always had a love affair with maths. "At school, I loved maths," he said. "I'm not the best mathematician you'll ever meet but I'm really good at getting excited about it and explaining it.

"For all the different ways you want to look at the world and understand it, predict it and measure it, numbers are the most powerful tool we have. I'm not dissing poetry, it has a role, but numbers are this incredible tool we've got."

Mr Woo, who has been named NSW Local Hero as the state subset of the Australian of the Year award, said

another tenet of the discipline was its exploratory nature.

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“Mathematics is about exploring, it has that same heart to it,” he said. “W.S. Anglin, an English mathematician put it this way, ‘Mathematics is not a careful march down a well-cleared highway, but a journey into a strange wilderness, where the explorers often get lost’.

“Teachers in the room, just ponder that, a ‘careful march down a well-cleared highway’. Doesn’t that closely describe a textbook? It’s not the textbook’s fault, it’s not the highway’s fault, it’s just that if that’s what we think about learning mathematics, we’re in trouble.

“Because getting lost means you’ll find new things. Is memorising rules what mathematics is about? I would suggest a better metaphor for maths is exploring. Where are we going today? What do we think we might find?”

Spencer put into perspective the incredible human mathematical journey that has got us to where we are today.

“In 1932, there’s this guy called Chadwick who discovers the neutron,” he said. “So it took us the 200,000 or so years from the dawn of human intelligence to come up with three particles. In 2017, just one human lifetime later, we’ve gone from three particles to 61. It’s just an unbelievable time to be alive. Now is not the time to get off the physics bus.”

Spencer said the goal of the day, “was to get people enjoying being in an environment where there’s nothing weird about being someone who likes problem solving. The challenge is normalising for students the fact that you are not the maths nerd or the weird loner, there’s an entire community of people who love this stuff and it’s a great skill that you should embrace and be proud of.”

He has high praise for public education, with two daughters in the system, and definite thoughts about its treatment.

“I couldn’t support public education more and we are lucky in this country to have the system we have,” he said. “It gobsmacks me that we don’t realise how much luckier we could be if the system was treated with the respect and nurturing it deserves rather than flogging it the way we do occasionally.”

— Scott Coomber