

# Achievement in mathematics and statistics

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## Summary of results from the 2018 National Monitoring Study of Student Achievement



### NMSSA in 2018

The National Monitoring Study of Student Achievement (NMSSA) is designed to assess student achievement across the New Zealand Curriculum (NZC) at Year 4 and Year 8 in English-medium state and state-integrated schools.

In 2018 the study focused on mathematics and statistics and social studies. Mathematics and statistics (hereafter generally referred to as mathematics, for brevity) was last assessed in 2013, and social studies in 2014.

### The NMSSA mathematics study

In 2018 NMSSA assessed achievement in mathematics using a nationally representative sample of about 2100 students from 100 schools at each of Year 4 and Year 8. The assessment included one-to-one interviews, a collaborative team activity, and short computer-interactive and written-response tasks. The assessment included items from across the three content strands: number and algebra, geometry and measurement, and statistics.

Scores on the assessment were located on the Mathematics and Statistics (MS) measurement scale (see graph at top right). MS scale scores ranged from about 30 to 180 MS units, with an average of 100 and a standard deviation of 20. Tasks that were used in both 2013 and 2018 allowed score comparisons to be made.

Questionnaires were used to gather information about teaching and learning in mathematics from students, teachers, and principals.

### Key findings regarding achievement

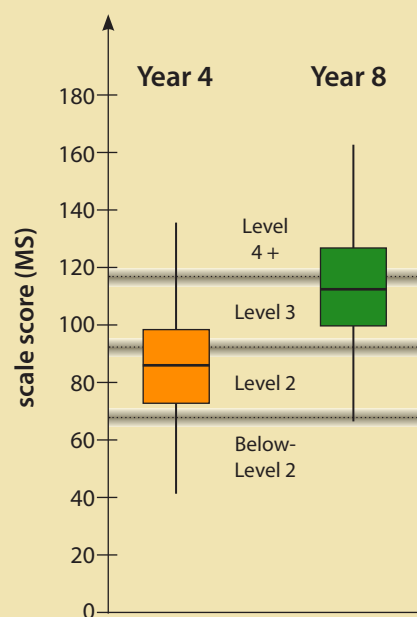
#### Results from 2018

- In Year 4, 81 percent of students achieved at or above curriculum expectations (Level 2). In Year 8, 45 percent of students achieved at or above curriculum expectations (Level 4).
- Between Year 4 and Year 8 students made, on average, about 8 MS units of 'progress' per year.
- Boys scored higher, on average, than girls by 3 MS units at Year 4 and 2 MS units at Year 8.
- Non-Māori students scored higher, on average, than Māori students by 11 MS units at both year levels.
- Non-Pacific students scored higher, on average, than Pacific students by 15 MS units at Year 4 and 13 MS units at Year 8.
- At both year levels, students from high decile schools scored higher, on average, than those from mid-decile schools, who, in turn, scored higher than those from low decile schools. At Year 4, the difference between the average scores for students in the high and low decile bands was 20 MS units. At Year 8, it was 18 MS units.

#### Changes in achievement between 2013 and 2018

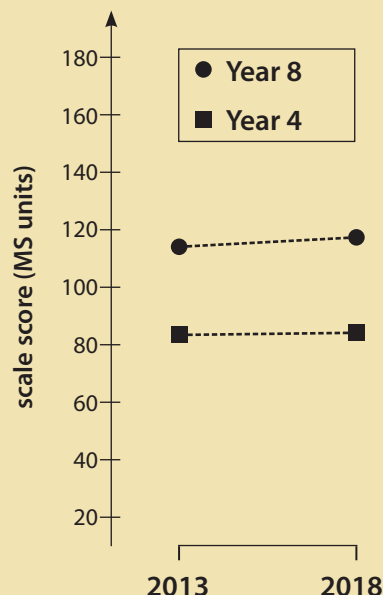
- Overall, average achievement in Year 8 was higher than in 2013 by 3 MS units. Differences in the overall average scores for Year 4 students between 2013 and 2018 were not statistically significant.
- Statistically significant increases in average achievement were recorded for Year 4 boys, Year 8 girls, Year 8 boys, Year 8 Pacific students, and for Year 8 students in low decile schools.

Distribution of Year 4 and Year 8 students' scores on the *Mathematics and Statistics* (MS) scale in 2018



The blurred lines (*above*) show the boundaries between curriculum levels. The lines are blurred to indicate the uncertainty involved in defining precise boundaries.

Change in average scores for Year 4 and Year 8 students on the *Mathematics and Statistics* (MS) scale between 2013 and 2018

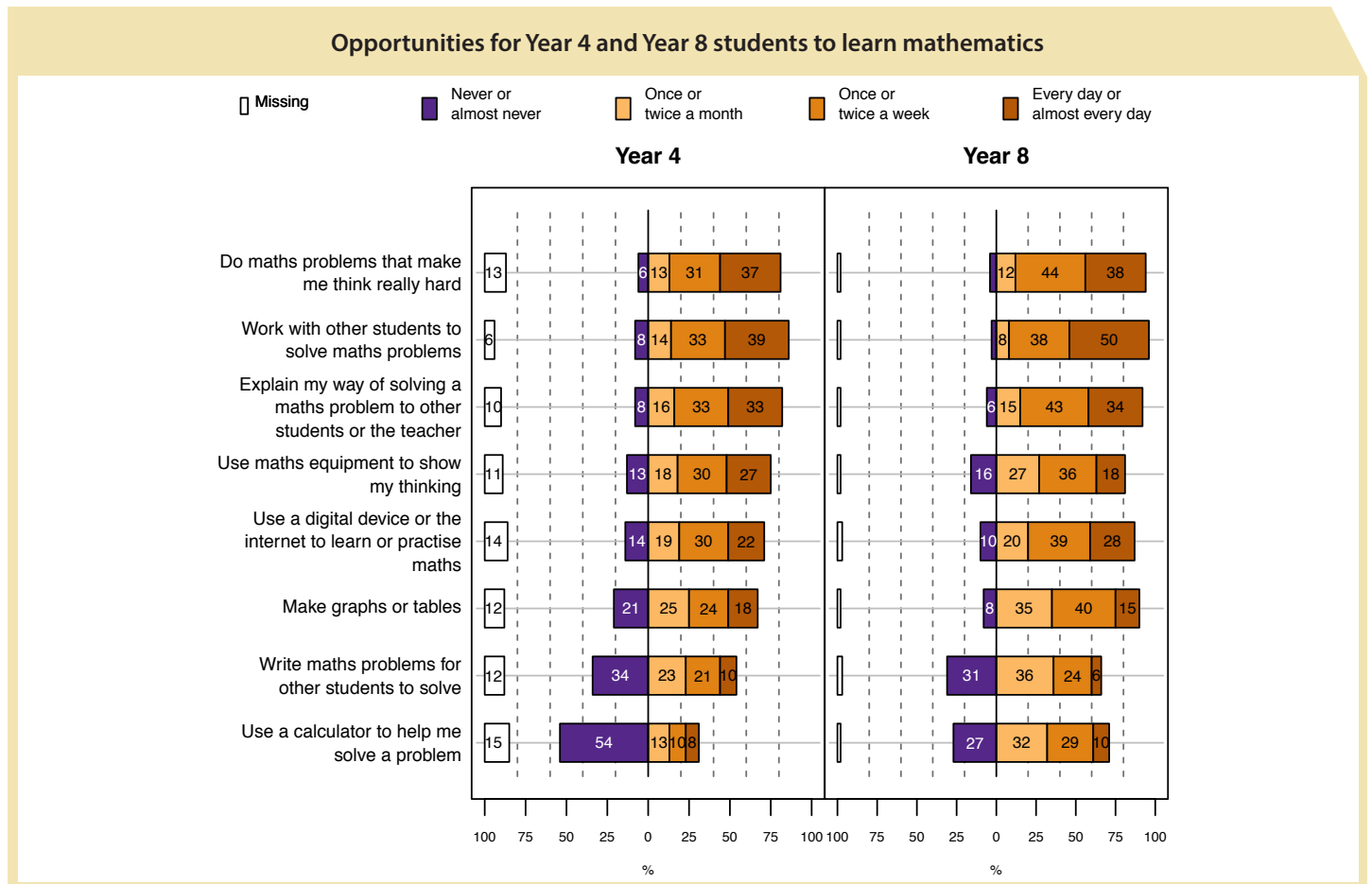


## Students' attitude to mathematics and confidence in mathematics

- Most students were positive about learning mathematics at school and expressed confidence as mathematics learners.
- Boys, in general, were more positive than girls about mathematics and expressed greater levels of confidence.
- Most students rated the difficulty of their mathematics learning as 'about right for me'.

## Opportunities to learn mathematics at school

Students indicated how often they were involved in a range of opportunities to learn mathematics at school (see figure below). For the majority of students, most activities happened 'at least once or twice a month'. 'Using a calculator to help solve problems' and 'writing maths problems for other students to solve' stood out in terms of the proportion of students who responded with 'never'.



## Teachers' and principals' perspectives on mathematics

- Year 8 teachers were more likely than Year 4 teachers to indicate that they had a qualification related to mathematics.
- Most teachers indicated that they enjoyed teaching mathematics and were confident about teaching it.
- Most teachers (at least 90 percent) at both year levels indicated students spent at least 3 hours a week learning mathematics at school.
- Around 80 to 85 percent of teachers at each year level reported using ability group-based activities on at least a weekly basis.
- Over half of teachers reported that they observed a colleague teach mathematics no more than once a year.
- About half of teachers rated the professional support they received for teaching mathematics as 'good' or 'very good'.
- Over 80 percent of principals rated their school's provision for learning in mathematics as either 'good' or 'very good'.
- In general, principals at both year levels were positive about the capabilities of the teachers in their schools to deliver the mathematics curriculum.

