

Programme for International Student Assessment (PISA)

PISA 2015: A first look at Australia's results

Sue Thomson
Lisa De Bortoli
Catherine Underwood



Programme for International Student Assessment (PISA)

PISA 2015: A first look at Australia's results

Sue Thomson
Lisa De Bortoli
Catherine Underwood

First published 2016
by Australian Council *for* Educational Research Ltd
19 Prospect Hill Road, Camberwell, Victoria, 3124, Australia

www.acer.edu.au
www.acer.edu.au/ozpisa/reports/

Text © Australian Council *for* Educational Research Ltd 2016
Design and typography © ACER Creative Services 2016

This report is copyright. All rights reserved. Except under the conditions described in the *Copyright Act 1968* of Australia and subsequent amendments, and any exceptions permitted under the current statutory licence scheme administered by Copyright Agency (www.copyright.com.au), no part of this publication may be reproduced, stored in a retrieval system, transmitted, broadcast or communication in any form or by any means, optical, digital, electronic, mechanical, photocopying, recording or otherwise, without the written permission of the publisher.

National Library of Australia Cataloguing-in-Publication entry

Thomson, S. (Susan), 1958– author.

PISA 2015: a first look at Australia's results / Sue Thomson, Lisa De Bortoli, Catherine Underwood.

9781742864174 (paperback)

9781742864181 (ebook)

Includes bibliographical references.

Programme for International Student Assessment.
Educational evaluation—Australia—Statistics.
Students, Foreign—Rating of—Australia—Statistics.
Young adults—Education—Australia—Statistics.

De Bortoli, Lisa Jean, 1968– author.

Underwood, Catherine, author.

Australian Council for Educational Research, issuing body.

The views expressed in this report are those of the authors and not necessarily those of the Commonwealth, state and territory governments.

The data contained in this report are in agreement with data provided by the OECD as at 1 November 2016.

Please note that there is the potential for minor revisions of data in this report.
Please check the online version at www.acer.edu.au/ozpisa for any amendments.

Contents

List of figures	iv	
List of tables	v	
Acknowledgements	vi	
Reader's Guide	vii	
Executive summary	xi	
Introduction	xiv	
Part A	PISA results in an international context	1
Section 1	Performance across countries in PISA 2015	2
Section 2	Trends in performance across countries	8
Section 3	Performance across countries by sex in PISA 2015	24
Part B	PISA results in a national context	29
Section 4	Performance across the Australian jurisdictions in PISA 2015	30
Section 5	Trends in performance across the Australian jurisdictions	35
Section 6	Performance across the Australian school sectors in PISA 2015	44
Section 7	Trends in performance across the Australian school sectors	47
Part C	PISA results across Australian demographic groups	49
Section 8	Results for male and female students	50
Section 9	Results for Indigenous students	53
Section 10	Results for school location	56
Section 11	Results for socioeconomic background	60
Section 12	Results for immigrant background	64
Section 13	Results for language background	68
Appendices	72	
References	80	

List of figures

Figure 0.1	Countries and economies participating in PISA 2015	xviii
Figure 0.2	Proficiency levels on the PISA scientific literacy scale	xxi
Figure 0.3	Proficiency levels on the PISA reading literacy scale	xxii
Figure 0.4	Proficiency levels on the PISA mathematical literacy scale	xxii
Figure 1.1	Average scores and proficiency levels in scientific literacy, by country	3
Figure 1.2	Average scores and proficiency levels in reading literacy, by country	5
Figure 1.3	Average scores and proficiency levels in mathematical literacy, by country	7
Figure 2.1	Average scientific literacy performance scores for PISA 2006 and 2015, and the differences between these two cycles, by country	9
Figure 2.2	Average scientific literacy performance and the differences over time, for Australia	11
Figure 2.3	Percentage of low and high performers in scientific literacy for PISA 2006 and 2015, by country	12
Figure 2.4	Percentage of low and high performers across the scientific literacy proficiency scale over time, for Australia	12
Figure 2.5	Average reading literacy performance scores for PISA 2009 and 2015 and the differences between these two cycles, by country	14
Figure 2.6	Average reading literacy performance and differences over time, for Australia	16
Figure 2.7	Percentage of low and high performers in reading literacy for PISA 2009 and 2015, by country	17
Figure 2.8	Percentage of low and high performers across the reading literacy proficiency scale over time, for Australia	18
Figure 2.9	Average mathematical literacy performance scores for PISA 2012 and 2015 and the differences between these two cycles, by country	19
Figure 2.10	Average mathematical literacy performance and differences over time, for Australia	21
Figure 2.11	Percentage of low and high performers in mathematical literacy for PISA 2012 and 2015, by country	23
Figure 2.12	Percentage of low and high performers across the mathematical literacy proficiency scale over time, for Australia	23
Figure 3.1	Average scores and differences in students' performance on the scientific literacy scale, by country and sex	25
Figure 3.2	Average scores and differences in students' performance on the reading literacy scale, by jurisdiction and sex	26
Figure 3.3	Average scores and differences in students' performance on the mathematical literacy scale, by country and sex	27
Figure 4.1	Average scores and proficiency levels in scientific literacy, by jurisdiction	30
Figure 4.2	Average scores and proficiency levels in reading literacy, by jurisdiction	32
Figure 4.3	Average scores and proficiency levels in mathematical literacy, by jurisdiction	34
Figure 5.1	Average scientific literacy performances and differences from PISA 2006 to 2015, by jurisdiction	36
Figure 5.2	Percentage of low and high performers on the scientific literacy proficiency scale over time	37
Figure 5.3	Average reading literacy performances and differences from PISA 2000 to 2015, by jurisdiction	39
Figure 5.4	Percentage of low and high performers on the reading literacy proficiency scale over time	40
Figure 5.5	Average mathematical literacy performances and differences from PISA 2003 to 2015, by jurisdiction	42
Figure 5.6	Percentage of low and high performers on the mathematical literacy proficiency scale over time	43
Figure 6.1	Average scores and proficiency levels in scientific, reading and mathematical literacy, by school sector (unadjusted for student- and school-level socioeconomic background)	45
Figure 7.1	Average students' performance for scientific, reading and mathematical literacy over time, by school sector (unadjusted for student- and school-level socioeconomic background)	48
Figure 8.1	Average scores and differences in students' performance on the scientific literacy scale, by jurisdiction and sex	50

Figure 8.2	Average scores and differences in students' performance on the reading literacy scale, by jurisdiction and sex	50
Figure 8.3	Average scores and differences in students' performance on the mathematical literacy scale, by jurisdiction and sex	51
Figure 8.4	Average student performance for scientific, reading and mathematical literacy performance over time, for Australia, by sex	52
Figure 9.1	Average scores and proficiency levels in scientific, reading and mathematical literacy, by Indigenous background	54
Figure 9.2	Average student performance for scientific, reading and mathematical literacy over time, by Indigenous background	55
Figure 10.1	Average scores and proficiency levels in scientific, reading and mathematical literacy, by geographic location	58
Figure 10.2	Average student performance for scientific, reading and mathematical literacy over time, by geographic location	59
Figure 11.1	Average scores and proficiency levels in scientific, reading and mathematical literacy, by socioeconomic background	61
Figure 11.2	Average student performance for scientific, reading and mathematical literacy over time, by socioeconomic background	63
Figure 12.1	Average scores and proficiency levels in scientific, reading and mathematical literacy, by immigrant background	66
Figure 12.2	Average student performance for scientific, reading and mathematical literacy over time, by immigrant background	67
Figure 13.1	Average scores and proficiency levels in scientific, reading and mathematical literacy, by language background	69
Figure 13.2	Average student performance for scientific, reading and mathematical literacy over time, by language background	71

List of tables

Table 0.1	Summary of the assessment domains in PISA	xv
Table 0.2	Number of Australian PISA 2015 schools, by jurisdiction and school sector	xix
Table 0.3	Number of Australian PISA 2015 students, by jurisdiction and school sector	xx
Table 0.4	Percentage of Australian PISA 2015 students, by jurisdiction and year level	xx
Table 2.1	Relative trends in scientific literacy performance, by country	10
Table 2.2	Relative trends in reading literacy performance, by country	15
Table 2.3	Relative trends in mathematical literacy performance, by country	20
Table 4.1	Average scores and multiple comparisons of scientific literacy performance, by jurisdiction	31
Table 4.2	Average scores and multiple comparisons of reading literacy performance, by jurisdiction	33
Table 4.3	Average scores and multiple comparisons of mathematical literacy performance, by jurisdiction	34
Table 6.1	Differences in average scientific, reading and mathematical literacy scores after adjustment for student- and school-level socioeconomic background	46
Table 9.1	Number and percentage of Australian PISA 2015 students, by Indigenous background	53
Table 10.1	Number and percentage of Australian PISA 2015 students, by geographic location	56
Table 12.1	Number and percentage of Australian PISA 2015 students, by immigrant background	64
Table 13.1	Number and percentage of Australian PISA 2015 students, by language background	68
Table A	Scientific literacy multiple comparison table for the Australian jurisdictions and PISA 2015 countries/economies	72
Table B	Reading literacy multiple comparison table for the Australian jurisdictions and PISA 2015 countries/economies	75
Table C	Mathematical literacy multiple comparison table for the Australian jurisdictions and PISA 2015 countries/economies	78

Acknowledgements



The Australian Government and the state and territory governments provided the funding for the Australian component of PISA 2015. All of Australia's share of the international overheads and half of the basic funding for PISA within Australia was contributed by the Australian Government Department of Education and Training, while each state and territory government education department provided funding in proportion to the numbers of 15-year-old students enrolled in their schools.

In Australia, PISA is guided by the International Assessments Joint National Advisory Committee (IAJNAC). ACER wishes to thank the IAJNAC members for their interest and commitment throughout every phase of the project. Their involvement included reviewing the frameworks and assessment items, assisting with the implementation of PISA in schools from their state or territory, and providing valuable information to ensure the success of PISA 2015 in Australia.

The undertaking of PISA 2015 was a collaborative effort. A national assessment such as PISA could not be successful without the cooperation of school systems, principals, teachers, students and parents. A high participation rate of the randomly selected schools and students is essential for the assessment to obtain high-quality data. It is thanks to this level of cooperation that Australia was able to satisfy the internationally set response criteria fully for PISA 2015. ACER gratefully acknowledges the assistance of education system officials Australia-wide, and the principals, teachers and students in the participating schools who so generously gave their time and support to the project.

Reader's Guide



Target population for PISA

This report uses '15-year-olds' as shorthand for the PISA target population. In practice, the target population was students who were aged between 15 years and 3 (complete) months and 16 years and 2 (complete) months at the beginning of the assessment period, and who were enrolled in an educational institution that they were attending full-time or part-time. Since the majority of the PISA target population is made up of 15-year-olds, the target population is often referred to as 15-year-olds.

Rounding of figures

Because of rounding, some numbers in tables may not exactly add to the totals reported. Totals, differences and averages are always calculated on the basis of exact numbers and are rounded only after calculation. When standard errors have been rounded to one or two decimal places and the value 0.0 or 0.00 is shown, this does not imply that the standard error is zero, but that it is smaller than 0.05 or 0.005 respectively.

Confidence intervals and standard errors

In this and other reports, student achievement is often described by an average score. For PISA, each average score is calculated from the sample of students who undertook PISA 2015 and is referred to as the sample average. The sample average is an approximation of the actual average score (known as the population average) that would have been obtained had all students in a country actually sat the assessment.

Since the sample average is just one point along the range of student achievement scores, more information is needed to gauge whether the sample average is an underestimation or overestimation of the population average. The calculation of confidence intervals can indicate the precision of a sample average as a population average. Confidence intervals provide a range of scores within which we are confident that the population average actually lies.

In this report, each sample average is presented with an associated standard error. The confidence interval, which can be calculated using the standard error, indicates that there is a 95% chance that the actual population average lies within plus or minus 1.96 standard errors of the sample average.

Statistical significance

The term 'significantly' is used throughout the report to describe a difference that meets the requirements of statistical significance at the 0.05 level, indicating that the difference is real, and would be found in at least 95 analyses out of 100 if the comparisons were to be repeated. It is not to be confused with the term 'substantial', which is qualitative and based on judgement rather than statistical comparisons. A difference may appear substantial but not statistically significant (due to factors that affect the size of the standard errors around the estimate, for example) while another difference may seem small but reach statistical significance because the estimate was more accurate.

Average performance

Average scores provide a summary of student performance and allow comparisons of the relative standing between different countries and different subgroups.

OECD average

The OECD average corresponds to the arithmetic average of the respective country estimates, and can be used to compare a country on a given indicator with a typical OECD country.

Proficiency levels

To summarise data from responses to PISA 2015, performance scales were constructed for each assessment domain. The scales are used to describe the performance of students in different countries, including in terms of described proficiency levels.

This report uses the following categories to describe students' levels of proficiency in PISA:

High performers: Students who are proficient at Level 5 or Level 6 are considered to demonstrate high levels of skills and knowledge and are highly proficient in the assessment domain.

Middle performers: Students who are proficient at Level 2, Level 3 or Level 4.

Low performers: Students who are below Level 2 proficiency are considered to demonstrate low levels of skills and knowledge in the assessment domain. Their proficiency is too low to enable them to participate effectively and productively in life.

PISA baseline proficiency level: In PISA, Level 2 is considered the international baseline proficiency level and defines the level of achievement on the PISA scale at which students begin to demonstrate the competencies that will enable them to actively and effectively participate in life situations.

National Proficient Standard in PISA: In Australia, the key performance measure in PISA has been set at the boundary between Level 2 and Level 3 on the PISA proficiency scales (as agreed in the *Measurement Framework for Schooling in Australia*). This level has been identified as the baseline because it represents 'a "challenging but reasonable" expectation of student achievement at a year level with students needing to demonstrate more than elementary skills expected at that year level' (ACARA, 2015, p. 5). Students performing at or above Level 3 have met or exceeded the National Proficient Standard.

Interpreting differences in the PISA scores

It is possible to estimate the score point difference that is associated with one year of schooling. This difference can be estimated for Australia because the Australian PISA 2015 sample included a sizeable number of students from different school year levels. Analyses of these data indicate that the difference between two year levels is, on average, 30 score points on the PISA scale.

Reporting of trends

Each cycle of PISA includes a number of items from previous cycles (referred to as trend items). This allows for comparisons with previous cycles to be made and trends (changes over time) to be measured.

The most reliable way to establish a trend for an assessment domain is to compare results between cycles when that assessment domain was the major domain.

The first full assessment of each domain (the major domain) sets the scale and provides a starting point for future comparisons. Reading literacy was the major domain for the first time in 2000, and again in 2009. Mathematical literacy was first assessed as a major domain in 2003, and again in 2012. Scientific literacy was the major domain for the first time in 2006, and again in 2015. Thus, it is possible to measure changes in reading literacy between PISA 2000 and 2015, changes in mathematical literacy between PISA 2003 and 2015, and changes in scientific literacy between PISA 2006 and 2015.

Definition of background characteristics

There are a number of definitions used in this report that are particular to the Australian context, as well as many that are relevant to the international context. This section provides an explanation for those that are not self-evident.

Indigenous background

Indigenous background is derived from information provided by the school, which was taken from school records. Students were identified as being of Australian Aboriginal or Torres Strait Islander descent. For the purposes of this report, data for the two groups are presented together under the term Indigenous Australian students.

Socioeconomic background

Two measures are used by the OECD to represent elements of socioeconomic background. One is the highest level of the father's and mother's occupation (known as the highest international social and economic index, or HISEI), which is coded in accordance with the International Labour Organization's International Standard Classification of Occupations. The other measure is the index of economic, social and cultural status (ESCS), which was created to capture the wider aspects of a student's family and home background. The ESCS is based on three indices: the highest occupational status of parents (HISEI); the highest educational level of parents in years of education (PARED); and home possessions (HOMEPOS). The index of home possessions (HOMEPOS) comprises all items on the indices of family wealth (WEALTH), cultural resources (CULTPOSS), access to home educational and cultural resources and books in the home (HEDRES). It must be noted that there have been some adjustments to the computation of ESCS over the PISA cycles.

Geographic location

In Australia, participating schools were coded with respect to the Ministerial Council on Education, Employment, Training and Youth Affairs' Schools Geographic Location Classification (Jones, 2004). For the analysis in this report, only the broadest categories are used:

- ▶ metropolitan – including mainland capital cities or major urban districts with a population of 100 000 or more (e.g., Queanbeyan, Cairns, Geelong, Hobart)
- ▶ provincial – including provincial cities and other non-remote provincial areas (e.g., Darwin, Ballarat, Bundaberg, Geraldton, Tamworth)
- ▶ remote – including areas with very restricted or very little accessibility of goods, services and opportunities for social interaction (e.g., Coolabah, Mallacoota, Capella, Mount Isa, Port Lincoln, Port Hedland, Swansea, Alice Springs, and Bourke, Thursday Island, Yalata, Condingup, Nhulunbuy).

Immigrant background

Immigrant background is derived from students' self-report of the country they and their parents were born. For the analysis in this report, immigrant background has been defined by the following categories:

- ▶ Australian-born students – students born in Australia with both parents born in Australia
- ▶ first-generation students – students born in Australia with at least one parent born overseas
- ▶ foreign-born students – students born overseas with both parents also born overseas.

Language background

Language background is derived from students' self-report of the language they speak at home most of the time. For the analysis in the report, language background has been defined as follows:

- ▶ students speak English at home
- ▶ students speak a language other than English at home.

Sample surveys

PISA is a sample survey and is designed and conducted so that the sample provides reliable estimates about the population of 15-year-old students. The PISA 2015 sample was a two-stage stratified sample. The first stage involved the sampling of schools in which 15-year-old students could be enrolled. The second stage of the selection process randomly sampled students within the sampled schools. The following variables were used in the stratification of the school sample: jurisdiction; school sector; geographic location; sex of students at the school; and a socioeconomic background variable (based on the Australian Bureau of Statistics' Socio-economic Indexes for Areas, which consists of four indexes that rank geographic areas across Australia in terms of their relative socioeconomic advantage and disadvantage).

Reporting of country results

This report does not include results for Argentina, Malaysia and Kazakhstan, because their coverage is too small to ensure comparability.

This report does not include results for countries that achieved an average score lower than Mexico, the lowest performing OECD country. As a result, this report does not include:

- ▶ scientific literacy results for: Algeria, Brazil, the Dominican Republic, the Former Yugoslav Republic of Macedonia, Georgia, Indonesia, Jordan, Kosovo, Lebanon, Montenegro, Peru and Tunisia.
- ▶ reading literacy results for: Albania, Algeria, Brazil, the Dominican Republic, the Former Yugoslav Republic of Macedonia, Georgia, Indonesia, Jordan, Kosovo, Lebanon, Moldova, Qatar, Thailand and Tunisia.
- ▶ mathematical literacy results for: Algeria, Brazil, Costa Rica, Colombia, the Dominican Republic, the Former Yugoslav Republic of Macedonia, Georgia, Indonesia, Jordan, Kosovo, Lebanon, Peru, Qatar and Tunisia.

Executive summary

The Programme for International Student Assessment (PISA) is an international comparative study of student achievement directed by the Organisation for Economic Co-operation and Development (OECD). PISA 2015 represents the sixth such study since PISA was first conducted in 2000. Seventy-two OECD countries or partner economies participated in PISA 2015. In Australia, PISA is managed by the Australian Council for Educational Research (ACER) and is jointly funded by the Australian Government and the state and territory governments.

The goal of PISA is to measure how well 15-year-olds, who are nearing the end of their compulsory schooling in most participating educational systems, are prepared to use the knowledge and skills in particular areas to meet real-life opportunities and challenges. It also provides comparative perspectives on trends in achievement in the context of different education systems, school organisational approaches and instructional practices; to enable this, PISA collects a rich array of background data from students, schools and teachers.

This report is a first look at the results from PISA 2015. This report focuses on the achievement results in scientific, reading and mathematical literacy, and in early 2017, will be followed by the full Australian National Report, which will examine achievement more fully and incorporate descriptive and analytical findings based upon the background and demographic data.

Scientific literacy

- ▶ Australia's average score in scientific literacy was 510 points. This was significantly higher than the OECD average of 493 points.
- ▶ Australia was significantly outperformed by 9 countries: Singapore, Japan, Estonia, Chinese Taipei, Finland, Macao (China), Canada, Vietnam, and Hong Kong (China).
- ▶ Australia's performance was not significantly different to that of 8 other countries (Germany, Korea, the Netherlands, New Zealand, Slovenia, Switzerland, the United Kingdom and B-S-J-G (China)), and was significantly higher than all remaining countries.
- ▶ Australia and 12 other countries showed a significant decline in their scientific literacy performance between 2006 and 2015. For Australia this decline was 17 points.
- ▶ Australia's proportion of high performers (11%) was higher than the OECD average, which was 8%.
- ▶ Australia's proportion of low performers (18%) was lower than the OECD average (21%).
- ▶ 61% of Australian students achieved the National Proficient Standard in scientific literacy.
- ▶ The Australian Capital Territory, Western Australia, Victoria, New South Wales, South Australia and Queensland performed at a significantly higher level than the OECD average (493 points). The Northern Territory's performance was not significantly different to the OECD average and Tasmania's was significantly lower.
- ▶ The proportion of students who reached the National Proficient Standard in scientific literacy was 48% in Tasmania; 51% in the Northern Territory; 59% in New South Wales; 60% in Queensland and South Australia; 63% in Victoria; 65% in Western Australia; and 68% in the Australian Capital Territory.
- ▶ In Victoria and the Northern Territory there was no decline in scores between 2006 and 2015. All other jurisdictions experienced a significant decline. Queensland had the smallest decline (15 points), followed by the Australian Capital Territory and Western Australia (22 points each), Tasmania (23 points), South Australia (24 points) and New South Wales had the largest decline (27 points).

Reading literacy

- ▶ Australia achieved an average score of 503 points in reading literacy, which was significantly higher than the OECD average of 493 points.
- ▶ Australia's performance was significantly below 11 countries (Canada, Estonia, Finland, Ireland, Japan, Korea, New Zealand and Norway, Singapore, Hong Kong (China) and Macao (China)).
- ▶ Australia's performance was not significantly different from that of 13 countries (Belgium, Denmark, France, Germany, the Netherlands, Poland, Portugal, Slovenia, Sweden, the United Kingdom, the United States, Chinese Taipei and B-S-J-G (China)). This group of countries significantly outperformed all other countries.
- ▶ The reading literacy performance for Australia and eight other countries declined significantly between 2009 and 2015. For Australia this decline was 12 points.
- ▶ Australia's proportion of high performers (11%) was higher than the OECD average (8%).
- ▶ Australia's proportion of low performers (18%) was lower than the OECD average (20%).
- ▶ 61% of Australian students achieved the National Proficient Standard in reading literacy.
- ▶ All jurisdictions performed significantly higher than the OECD average, except for Tasmania and the Northern Territory, whose performances were significantly lower than the OECD average.
- ▶ The proportion of students who reached the National Proficient Standard in reading literacy was 48% in Tasmania and the Northern Territory; 59% in New South Wales; 60% in Queensland; 61% in South Australia; 63% in Victoria and Western Australia; and 65% in the Australian Capital Territory.
- ▶ The Australian Capital Territory, New South Wales, South Australia, and Tasmania had a significant decline in performance between 2000 and 2009. Victoria, Queensland, Western Australia and the Northern Territory were not significantly different between 2000 and 2009. Between 2009 and 2015, Queensland was the only jurisdiction to show a significant decline in performance (by 19 points). In 2015, the performances of all other jurisdictions were not significantly different to their performances in 2009.

Mathematical literacy

- ▶ Australian students achieved an average score of 494 points in mathematical literacy, which was significantly higher than the OECD average of 490 points.
- ▶ Australia's performance was significantly below 19 countries (Japan, Korea, Switzerland, Estonia, Canada, the Netherlands, Denmark, Finland, Slovenia, Belgium, Germany, Poland, Ireland and Norway, Singapore, Hong Kong (China), Macao (China), Chinese Taipei and B-S-J-G (China)).
- ▶ Australia's performance was not significantly different from that of 10 countries (Austria, New Zealand, Vietnam, the Russian Federation, Sweden, France, the United Kingdom, the Czech Republic, Portugal and Italy), and significantly higher than all remaining countries.
- ▶ Australia was one of 10 countries whose performance declined significantly between 2012 and 2015. The decline in Australia's performance was 10 points.
- ▶ Australia's proportion of high performers (11%) was consistent with the OECD average.
- ▶ Australia's proportion of low performers (22%) was about the same as the OECD average (23%).
- ▶ 55% per cent of Australian students achieved the National Proficient Standard in mathematical literacy.
- ▶ The Australian Capital Territory, Western Australia and Victoria performed at a significantly higher level than the OECD average. New South Wales, South Australia, Queensland and the Northern Territory were not significantly different to the OECD average. Tasmania performed significantly lower than the OECD average.

- ▶ The proportion of students who reached the National Proficient Standard in mathematical literacy was 44% in Tasmania; 47% in the Northern Territory; 53% in Queensland; 54% in South Australia; 55% in New South Wales; 58% in Victoria; 60% in Western Australia; and 61% in the Australian Capital Territory.
- ▶ In seven jurisdictions, the average mathematical literacy scores between 2003 and 2012 declined significantly. Queensland had the smallest decline (16 points), followed by New South Wales (17 points), the Australian Capital Territory and Tasmania (each 30 points), Western Australia (32 points), Northern Territory (45 points) and South Australia with the largest decline (46 points). The change in performance for Victoria was not significantly different between 2003 and 2012.

Introduction



What is PISA?

The Programme for International Student Assessment (PISA) is an international study that measures how well 15-year-olds,¹ who are nearing the end of their compulsory schooling in most participating education systems, are prepared to use their knowledge and skills in particular areas to meet real-life opportunities and challenges. This is in contrast to assessments that seek to measure the extent to which students have mastered a specific curriculum.

What are the main goals of PISA?

PISA looks to answer several important questions related to education, such as:

- ▶ How well are young adults prepared to meet the challenges of the future? Can they analyse, reason and communicate their ideas effectively? Will their skills enable them to adapt to rapid societal change?
- ▶ Are some ways of organising schools and school learning more effective than others?
- ▶ What influence does the quality of school resources have on student outcomes?
- ▶ What educational structures and practices maximise the opportunities of students from disadvantaged backgrounds?
- ▶ How equitable is the provision of education within a country and across countries?

What does PISA assess?

The assessment domains of scientific literacy, reading literacy and mathematical literacy are measured in PISA. The PISA 2015 cognitive assessment also included the additional domain of collaborative problem solving. The same students who sat PISA 2015 also sat an assessment of financial literacy. Results on the performance of Australian students in these additional domains will be released in two separate reports in 2017.

In the PISA context, the three assessment domains are defined as following.

Scientific literacy is the ability to engage with science-related issues, and with the ideas of science, as a reflective citizen. A scientifically literate person is willing to engage in reasoned discourse about science and technology, which requires the competencies to explain phenomena scientifically, evaluate and design scientific enquiry, and interpret data and evidence scientifically.

Reading literacy is an individual's capacity to understand, use, reflect on and engage with written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society.

Mathematical literacy is an individual's capacity to formulate, employ and interpret mathematics in a variety of contexts. It includes reasoning mathematically and using mathematical concepts, procedures, facts and tools to describe, explain and predict phenomena. It assists individuals to recognise the role that mathematics plays in the world and to make the well-founded judgments and decisions needed by constructive, engaged and reflective citizens.

(OECD, 2016, p. 13)

¹ Refer to the Reader's Guide for more information about the target population for PISA.

How often is PISA administered?

Since 2000, PISA has been conducted every three years. In each cycle, the three assessment domains are rotated so that one domain is the major focus (the major domain), with a larger amount of the assessment time being devoted to this domain compared to the other two assessment domains (the minor domains).

PISA 2015 was the sixth cycle of PISA and scientific literacy was the major domain, which allowed an in-depth analysis and the reporting of results by subscale to be undertaken. The assessment of scientific literacy as a major domain in PISA 2015 also allows for changes in performance to be reported over a nine-year period, from PISA 2006 when scientific literacy was first assessed as a major domain (Table 0.1).

TABLE 0.1 Summary of the assessment domains in PISA

PISA 2000	PISA 2003	PISA 2006	PISA 2009	PISA 2012	PISA 2015
Reading literacy	Reading literacy	Reading literacy	Reading literacy	Reading literacy	Reading literacy
Mathematical literacy	Mathematical literacy	Mathematical literacy	Mathematical literacy	Mathematical literacy	Mathematical literacy
Scientific literacy	Scientific literacy	Scientific literacy	Scientific literacy	Scientific literacy	Scientific literacy

■ ■ ■ Major domain
 ■ Minor domain

What has changed for PISA 2015?

A number of changes have been introduced to the test administration and scaling for PISA 2015. The changes relate to the assessment mode, scaling model, treatment of non-reached items, treatment of differential item functioning, and construct coverage across domains.²

Assessment mode

In PISA 2015, the main mode of assessment has moved from a paper-based delivery to a computer-based delivery. The computer-based assessment included trend items (that were originally developed for delivery as a paper-based assessment and were adapted for delivery on computer)³ and new scientific literacy items. The computer-based assessment allowed for a greater variety of contexts to be included in the scientific literacy assessment. Approximately 13% of new scientific literacy items were developed to incorporate interactive presentations, where students' actions determined what they saw on the screen.

Fifty-seven countries, including all OECD countries, administered PISA as a computer-based assessment. The 15 countries and economies that administered PISA as a paper-based assessment completed only trend items (which represent about half of all the items used in the computer-based assessments). Results for both the computer- and paper-based assessments are reported on the same scale.

² For more information about the changes in PISA 2015, please refer to the *PISA 2015 Technical Report* (OECD, forthcoming).

³ A mode study was undertaken in the field trial to assess the equivalence between the paper- and computer-based versions of trend items.

The computer-based delivery facilitated an improved test design. Students may perceive items as being of varying difficulty, or students may apply varying degrees of effort, depending on the position of the item in the test booklet. Rotating the positions of items across different versions of test booklets mitigates this effect. In previous cycles of PISA, there were 13 different test booklets; in PISA 2015, computer-based delivery allowed for 66 different test forms.

The computer-based software uses a 'lock-step' design, which prevents students from returning to a unit that has been previously completed. At the end of the unit, students are advised that they will be unable to return to the unit, and consequently once students reach the end of the test they are unable to review their answers.

Scaling model

In previous cycles, a one-parameter model was used to scale the items. In PISA 2015, a hybrid model was used, which incorporates the one-parameter model for the trend items as well as a two-parameter model on which new items were scaled.

Treatment of non-reached items

Items at the end of the assessment that students did not answer are referred to as 'not reached'. In this cycle of PISA, the not-reached items were treated as not administered, whereas in previous cycles they were treated as incorrect (when estimating student proficiency) and as not administered (when estimating the item parameters).

Treatment of differential item functioning

Some items function differently in one country compared to the majority of countries. In PISA 2015, the calibration allowed for unique item parameters to be applied to these items whereas in previous cycles, these items were treated as not administered.

Construct coverage across domains

In PISA 2015, the number of trend items were increased for all domains to improve the coverage of items between minor and major domains.

The results from PISA enable performance over time to be monitored. However, given the number of changes that have occurred in PISA 2015, comparisons between the results for this cycle and previous cycles should be interpreted with due caution.

What did participants do?

Students

Students completed a two-hour cognitive assessment. Students were also allowed up to 45 minutes to complete the student questionnaires, which they responded to after the completion of the PISA cognitive assessment. Students then undertook the financial literacy assessment.

Students were randomly assigned to a test form that comprised four 30-minute clusters of cognitive materials (scientific literacy, reading literacy, mathematical literacy, and collaborative problem solving),

with each cluster consisting of units that required them to construct responses to a stimulus and a series of questions. The stimulus material was typically a brief written passage or text accompanying a table, chart, graph, photograph or diagram. A range of item-response formats, such as multiple-choice questions and questions requiring students to construct their own responses, were used to cover the full range of cognitive abilities and knowledge identified in the Assessment Framework.⁴

Students were assigned three student questionnaires. These consisted of the internationally standardised student questionnaire, and two additional student questionnaires that were offered as international options: an information and communications technology (ICT) questionnaire and an educational career questionnaire. The student questionnaire sought information on students and their family background, aspects of students' lives, such as their attitudes towards learning, their habits and life in and outside of school, aspects of students' interest, motivation and engagement, and learning and instruction in science, including instructional time and class size. The ICT questionnaire collected information on the availability and use of ICT, students' perceptions of their competence in completing tasks, and their attitudes towards computer use. The educational career questionnaire gathered information about students' interruptions of schooling and their preparation for their future career.

School principals

Principals from participating schools were asked to complete a school questionnaire, which collected descriptive information about the school, including the quality of the school's human and material resources, decision-making processes, instructional practices, and school and classroom climate.

Teachers

A teacher questionnaire was also offered as an international option for the first time in PISA 2015, and Australia was one of the 19 countries that participated in this option. There were two questionnaire options: one which had a focus for science teachers and the other for non-science teachers. The questionnaires collected information about teachers' educational background and training, teaching practices, teacher-directed teaching and learning activities in science lessons.

Administration of PISA

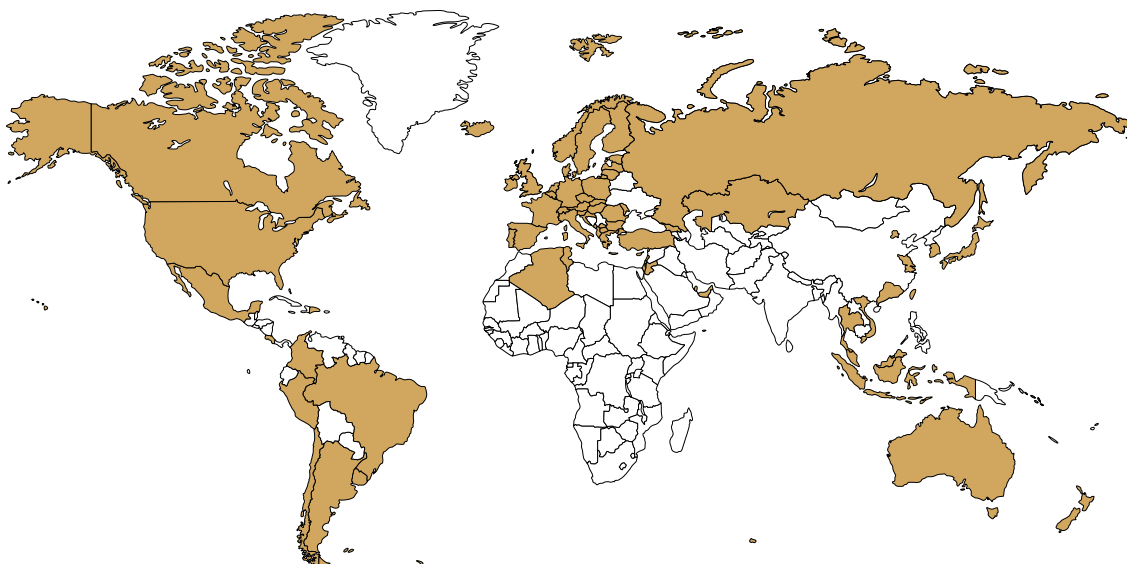
Students completed the cognitive assessment and questionnaires using computers and USB drives. The school principals and teachers completed their questionnaires online using logins to a secure website. In Australia, PISA 2015 took place during a six-week period from late July to early September 2015.

⁴ The Assessment Framework explains the guiding principles behind the PISA 2015 assessment. Refer to the *PISA 2015 assessment and analytical framework* (OECD, 2016).

Who participates in PISA?

Countries

Although PISA was originally an OECD assessment created by the governments of OECD countries, it has become a major assessment in many regions and countries around the world. There were 72 countries and economies that participated in PISA 2015, including 35 OECD countries and 37 partner countries or economies (Figure 0.1).⁵



OECD countries			Partner countries/economies		
Australia	Hungary	Norway	Albania	Former Yugoslav Republic of Macedonia	Moldova
Austria	Iceland	Poland	Algeria	Georgia	Montenegro
Belgium	Ireland	Portugal	Argentina†	Hong Kong (China)	Peru
Canada	Israel	Slovak Republic	Brazil	Indonesia	Qatar
Chile	Italy	Slovenia	B-S-J-G (China)*	Jordan	Romania
Czech Republic	Japan	Spain	Bulgaria	Kazakhstan†	Russian Federation
Denmark	Korea	Sweden	Chinese Taipei	Kosovo	Singapore
Estonia	Latvia	Switzerland	Colombia	Lebanon	Thailand
Finland	Luxembourg	Turkey	Costa Rica	Lithuania	Trinidad and Tobago
France	Mexico	United Kingdom	Croatia	Macao (China)	Tunisia
Germany	The Netherlands	United States	Cyprus	Malta	United Arab Emirates
Greece	New Zealand		Dominican Republic	Malaysia†	Uruguay
					Vietnam

* B-S-J-G (China) refers to the four PISA participating provinces: Beijing, Shanghai, Jiangsu and Guangdong.

† Results for Argentina, Malaysia and Kazakhstan have not been reported in this report because their coverage was too small to ensure comparability.

Note: 15 countries (Albania, Algeria, Argentina, Georgia, Indonesia, Jordan, Kazakhstan, Kosovo, Lebanon, Former Yugoslav Republic of Macedonia, Malta, Moldova, Romania, Trinidad and Tobago, and Vietnam) administered PISA as a paper-based assessment.

Although 72 countries and economies participated in PISA 2015, only those countries with an average score higher than the lowest scoring OECD country, Mexico, have been reported in this publication. Further details are provided in the Reader's Guide.

FIGURE 0.1 Countries and economies participating in PISA 2015

⁵ PISA 2015 assessed the economic regions of Beijing, Shanghai, Jiangsu and Guangdong (B-S-J-G) (China), Chinese Taipei, Hong Kong (China) and Macao (China). Economic regions are required to meet the same PISA technical standards as other participating countries. Results for an economic region are only representative of the region assessed and are not representative of the country. For convenience, this report refers to these economic regions as countries.

Schools

In most countries, 150 schools and 35 students within each school were randomly selected to participate in PISA. In some countries, including Australia, a larger sample of schools and students participated. This allowed countries to carry out specific national options at the same time as the PISA assessment and for meaningful comparisons to be made between different sectors of the population.

In Australia, a larger sample of schools and students participated in PISA to produce reliable estimates representative for each of the Australian jurisdictions⁶, and for Indigenous students. In order for comparisons to be made between jurisdictions, it was necessary to oversample the smaller jurisdictions, because a random sample proportionate to jurisdiction populations would not yield sufficient students in the smaller jurisdictions to give a result that would be sufficiently precise. Further, a sufficiently large sample of Australia's Indigenous students was required so that valid and reliable separate analyses could be conducted.

The Australian PISA 2015 school sample consisted of 758 schools (Table 0.2). The sample was designed so that schools were selected with a probability proportional to the enrolment of 15-year-olds in each school. Stratification of the sample ensured that the PISA sample was representative of the Australian population of 15-year-olds. Several variables were used in the stratification of the school sample including jurisdiction, school sector, geographic location, sex of students at the school and a socioeconomic background variable.⁷

TABLE 0.2 Number of Australian PISA 2015 schools, by jurisdiction and school sector

Jurisdiction	Sector			Total
	Government	Catholic	Independent	
ACT	25	8	9	42
NSW	105	44	28	177
VIC	75	30	25	130
QLD	81	27	25	133
SA	55	22	21	98
WA	57	20	21	98
TAS	33	12	8	53
NT	15	5	7	27
Australia	446	168	144	758

Note: These numbers are based on unweighted data.

Students

The target population for PISA is students who are aged between 15 years and 3 months and 16 years and 2 months at the beginning of the testing period and are enrolled in an educational institution, either full- or part-time. Since the largest part (but not all) of the PISA target population is made up of 15-year-olds, the target population is often referred to as 15-year-olds.

In each country, a random sample of 35 students was selected with equal probability from each of the randomly selected schools using a list of all 15-year-old students submitted by the school. More than half a million students took part in PISA 2015, representing approximately 35 million 15-year-old students internationally. In most Australian jurisdictions, 20 students and all age-eligible Indigenous students were sampled per school. In the Australian Capital Territory, 30 students and all age-eligible Indigenous students were sampled per school, and in the Northern Territory, 27 students and all age-eligible Indigenous students were sampled per school. The Australian PISA 2015 sample of

⁶ Throughout this report, the Australian states and territories will be collectively referred to as jurisdictions.

⁷ Based on the Australian Bureau of Statistic's Socio-Economic Indexes for Areas.

of 14 530 students, whose results feature in the national and international reports, was drawn from all jurisdictions and school sectors according to the distributions shown in Table 0.3.

TABLE 0.3 Number of Australian PISA 2015 students, by jurisdiction and school sector

Sector		Jurisdiction								Total
		ACT	NSW	VIC	QLD	SA	WA	TAS	NT	
Government	N students	496	2 053	1 253	1 905	922	1 104	654	275	8 662
	Weighted N	2 304	46 660	36 144	31 221	10 273	16 236	3 710	1 377	147 925
Catholic	N students	210	849	530	579	391	355	248	115	3 277
	Weighted N	1 406	20 634	14 810	10 784	4 039	5 635	1 296	259	58 863
Independent	N students	211	471	403	456	367	410	133	140	2 591
	Weighted N	822	12 906	13 252	10 903	3 887	6 356	944	472	49 542
Australia	N students	917	3 373	2 186	2 940	1 680	1 869	1 035	530	14 530
	Weighted N	4 532	80 200	64 206	52 908	18 199	28 227	5 950	2 108	256 330

Note: N students is based on the achieved (unweighted) sample; weighted N is based on the number of students in the target population represented by the sample.

As the sample is age-based in PISA, the students come from various year levels but they are mostly from Years 9, 10 and 11. There are some variations to the year-level composition of the sample in the different jurisdictions as shown in Table 0.4, because of differing school starting ages in different jurisdictions.

TABLE 0.4 Percentage of Australian PISA 2015 students, by jurisdiction and year level

Jurisdiction	Year level					
	7	8	9	10	11	12
ACT			12	81	7	
NSW	^	^	12	81	6	
VIC	^	^	23	75	1	^
QLD		^	2	51	47	^
SA		^	8	87	5	^
WA			1	86	13	
TAS			32	68	^	
NT	^	^	8	79	13	
Australia	^	^	11	75	14	^

^ denotes percentages ≤ 1

Note: These percentages are based on unweighted data; the jurisdiction totals are reported as whole numbers without rounding off decimal places.

How are results reported in PISA?

PISA results are reported on a set of scales. Each scale was developed when an assessment domain was first assessed as a major domain (in 2006 for scientific literacy, in 2000 for reading literacy, and in 2003 for mathematical literacy). Each scale was originally constructed to have an average score of 500 and a standard deviation of 100 among OECD countries.

Averages and standard errors

Similar to other international studies, PISA results are reported as average scores, which provide a summary of student performance and allow for comparisons of the relative standing between different countries and different subgroups. The OECD average⁸ is the average of the data values

⁸ Although the OECD average is comparable between cycles, changes in the average can not only reflect the change in the performance of OECD countries over time, but may also reflect the addition of new member countries of the OECD.

across all OECD countries, and can be used to compare a country on a given indicator with a typical OECD country.

Interpreting differences in PISA scores

It is possible to estimate the score point difference that is associated with one year of schooling. For Australia, one year of schooling corresponds to 30 score points for all three assessment domains.

Proficiency levels

PISA also provides a profile of students' scientific, reading and mathematical performance using proficiency levels – categories that summarise the skills and knowledge which students are able to display. The performance scale is divided into levels of difficulty, referred to as proficiency levels. Students at a particular level not only typically demonstrate the knowledge and skills associated with that level, but also the proficiencies required at lower levels.

Seven levels of proficiency, ranging from Level 1b (the lowest proficiency level) to Level 6 (the highest proficiency level), have been defined for the domain of scientific literacy and the domain of reading literacy. A difference of 75 score points represents one proficiency level on the PISA scientific literacy scale, while a difference of 73 score points represents one proficiency level on the PISA reading literacy scale. For mathematical literacy, there are six levels, ranging from Level 1 (the lowest proficiency level) to Level 6 (the highest proficiency level), with 62 score points representing one proficiency level on the PISA mathematical literacy scale.

Figures 0.2, 0.3 and 0.4 provide a description of the skills and knowledge that students typically demonstrate for scientific literacy, reading literacy and mathematical literacy.

	Proficiency level	Students at this level can
High performers	6	draw on a range of interrelated scientific ideas and concepts and use content, procedural and epistemic knowledge in order to offer explanatory hypotheses; discriminate between relevant and irrelevant information; distinguish between arguments that are based on scientific evidence and theory; and evaluate competing designs of complex experiments, field studies or simulations and justify their choices.
	5	use abstract scientific ideas or concepts to explain unfamiliar and more complex phenomena, events and processes involving multiple causal links; apply more sophisticated epistemic knowledge to evaluate alternative experimental designs; evaluate ways of exploring a given question scientifically; and identify limitations in interpretations of data sets.
Middle performers	4	use more complex or more abstract content knowledge to construct explanations of events and processes; conduct experiments involving two or more independent variables; interpret data drawn from a moderately complex data set or less familiar context; draw appropriate conclusions that go beyond the data and provide justifications for their choices.
	3	draw upon moderately complex content knowledge to identify or construct explanations of familiar phenomena; draw on elements of procedural or epistemic knowledge to carry out a simple experiment in a constrained context; and distinguish between scientific and non-scientific issues and identify the evidence supporting a scientific claim.
	2	draw on everyday content knowledge and basic procedural knowledge to identify an appropriate scientific explanation; interpret data; use basic or everyday scientific knowledge to identify a valid conclusion from a simple data set; demonstrate basic epistemic knowledge and identify questions that can be investigated scientifically.
Low performers	1a	use everyday content and procedural knowledge to recognise or identify explanations of simple scientific phenomenon; with support, undertake structured scientific enquiries with no more than two variables; identify simple causal or correlational relationships and interpret graphical and visual data that require a low level of cognitive demand.
	1b	use basic scientific knowledge to recognise aspects of familiar or simple phenomenon; identify simple patterns in data; recognise basic scientific terms; and follow explicit instructions to carry out a scientific procedure.
	below Level 1b	not demonstrate even the most basic types of scientific literacy that PISA measures.

FIGURE 0.2 Proficiency levels on the PISA scientific literacy scale

	Proficiency level	Students at this level can
High performers	6	make multiple inferences, comparisons and contrasts; demonstrate a full and detailed understanding of one or more texts; integrate information from more than one text; and deal with unfamiliar ideas in the presence of prominent competing information.
	5	locate and organise several pieces of deeply embedded information, inferring which information in the text is relevant; and critically evaluate or hypothesise, drawing on specialised knowledge.
Middle performers	4	locate and organise several pieces of embedded information; interpret the meaning of nuances of language in a section of text; and demonstrate an accurate understanding of long or complex texts whose content or form may be unfamiliar.
	3	locate (and in some cases recognise the relationship between) several pieces of information; integrate several parts of a text in order to identify a main idea; locate required information that is not prominent or where there is much competing information; and demonstrate a fine understanding of the text in relation to familiar, everyday knowledge.
	2	locate one or more pieces of information; recognise the main idea in a text; and understand relationships, or construe meaning within a limited part of the text, when the information is not prominent and the reader must make low-level inferences.
Low performers	1a	locate one or more independent pieces of explicitly stated information; recognise the main theme or author's purpose in a text about a familiar topic; and make simple connections.
	1b	locate a single piece of explicitly stated information in a prominent position in a short, syntactically simple text with a familiar context and text type in which there is a high level of support for the reader.
	below Level 1b	not demonstrate even the most basic types of reading literacy that PISA measures.

FIGURE 0.3 Proficiency levels on the PISA reading literacy scale

	Proficiency level	Students at this level can
High performers	6	conceptualise, generalise and use information; use advanced mathematical thinking and reasoning; have a mastery of symbolic and formal mathematical operations and relationships; and formulate and precisely communicate their findings, interpretations and arguments.
	5	develop and work with models for complex situations; select, compare and evaluate appropriate problem-solving strategies for dealing with complex problems; work strategically using broad, well-developed thinking and reasoning skills; and reflect on their work and formulate and communicate their interpretations and reasoning.
Middle performers	4	work effectively with explicit models for complex, concrete situations; select and integrate different representations, including symbolic representations; utilise their skills and reason with insight; and construct and communicate explanations and arguments.
	3	execute clearly described procedures, including those that require sequential decisions; select and apply simple problem-solving strategies; interpret and use representations; typically show some ability to handle percentages, fractions and decimal numbers, and to work with proportional relationships; and provide solutions that reflect that they have engaged in basic interpretation and reasoning.
	2	interpret and recognise situations in contexts that require no more than direct inference; extract relevant information from a single source and make use of a single representational mode; employ basic algorithms, formulas, procedures or conventions to solve problems involving whole numbers; and make literal interpretations of the results.
Low performers	1	answer questions involving familiar contexts where all relevant information is present and the questions are clearly defined; identify information and carry out routine procedures; and perform actions that are almost always obvious and follow immediately from the given stimuli.
	below Level 1	not demonstrate even the most basic types of mathematical literacy that PISA measures.

FIGURE 0.4 Proficiency levels on the PISA mathematical literacy scale

Organisation of the report

This report provides the initial results from PISA 2015 for Australia. Part A presents results in an international context, Part B presents results in a national context, and Part C presents results of different Australian demographic groups.

Further information

The full report on Australian results from PISA 2015 will be released in February 2017. This report will provide a more comprehensive discussion of Australian students' performance in PISA 2015, an overview of the assessment domains, a discussion of Australian students' motivation and beliefs in science, the school learning environment, and the relationship between socioeconomic background and performance.

Further information about PISA in Australia is available from the national PISA website at www.acer.edu.au/ozpisa



PISA results in an international context

PART

A

1.1 Scientific literacy

- ▶ Australia achieved an average score of 510 points in scientific literacy, which was significantly higher than the OECD average of 493 points.
- ▶ Australia's performance was significantly below 9 countries (4 OECD: Canada, Estonia, Finland and Japan; 5 partner: Chinese Taipei, Hong Kong (China), Macao (China), Singapore, and Vietnam).
- ▶ Australia's performance was not significantly different from that of 8 countries (7 OECD: Germany, Korea, the Netherlands, New Zealand, Slovenia, Switzerland, the United Kingdom; 1 partner: B-S-J-G (China)).
- ▶ Australia's performance was significantly higher than the remaining participating countries, which included 23 OECD countries.
- ▶ Singapore was the highest performing country in scientific literacy in PISA 2015 with a score of 556 points. Australia's score of 510 points was equivalent to around one-and-a-half years of schooling lower than Singapore's achieved score.
- ▶ While the spread between the 5th and 95th percentiles for the OECD countries was 309 points, Malta had the largest spread between highest and lowest achievers (384 points) and Costa Rica and Mexico had the smallest spread (around 230 points). Australia was one of the countries with the broadest range of student abilities (336 points), which is similar to the spread between highest and lowest achievers in Israel (346 points), New Zealand (341 points), and Singapore (340 points).
- ▶ Australia's proportion of high performers (11%) was higher than the OECD average, which was 8%. However, 24% of students in Singapore and between 15% and 10% of students from Chinese Taipei, Japan, Finland, B-S-J-G (China), New Zealand, Canada, the Netherlands, the United Kingdom, Korea, Slovenia, Germany and Switzerland were high performers. All other countries had fewer than 11% of students who were high performers.
- ▶ Australia had a lower proportion of low performers (18%) compared to the OECD average (21%), while countries that performed significantly higher than Australia had between 6% and 12% of low performers.
- ▶ 61% of Australian students achieved the National Proficient Standard in scientific literacy.
- ▶ Figure 1.1 lists the average scientific literacy scores, along with the standard errors, confidence intervals around the average and the difference between the 5th and 95th percentiles. This figure also shows the proportions of high, middle and low performers on the scientific literacy scale for countries.

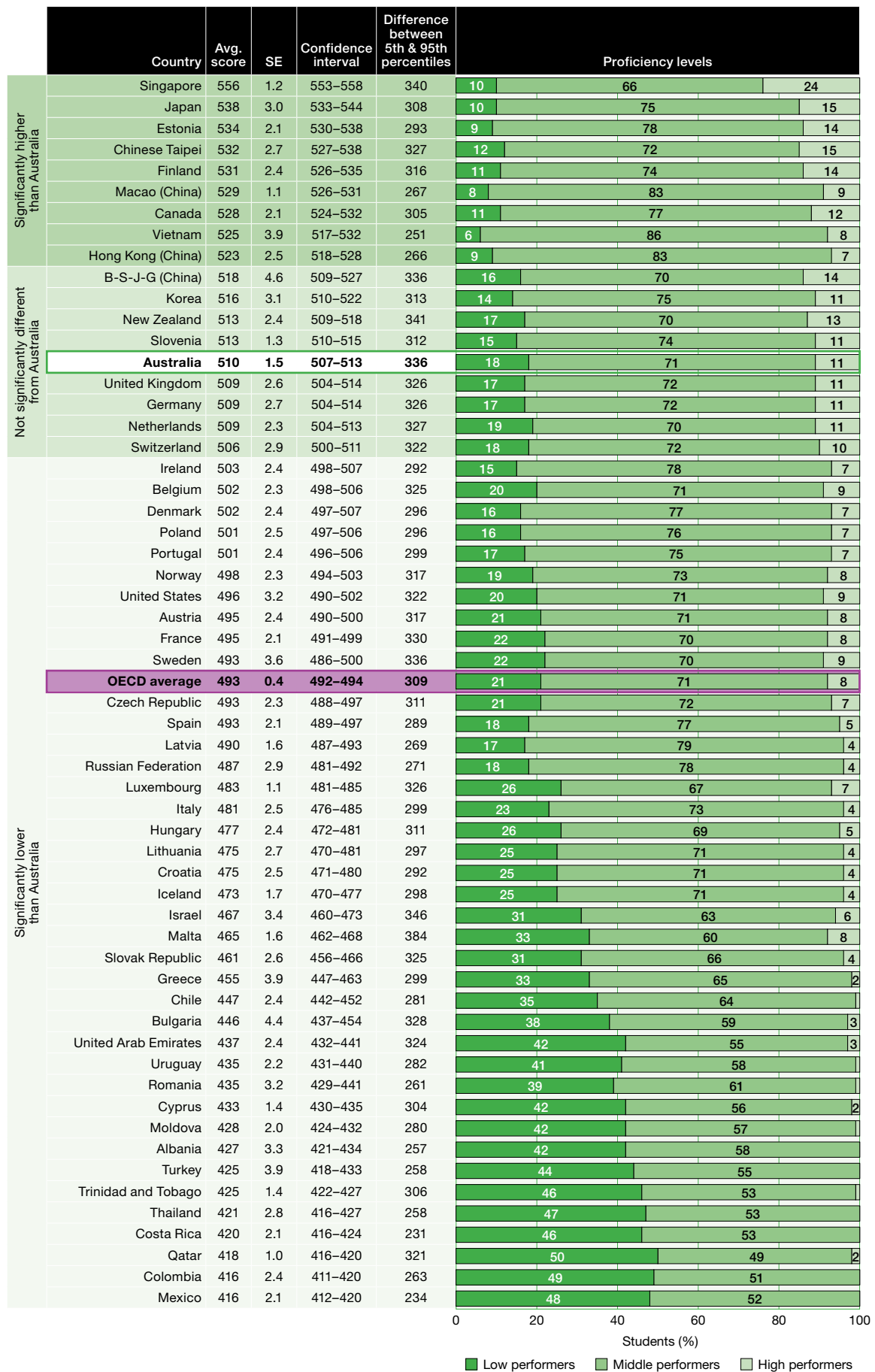


FIGURE 1.1 Average scores and proficiency levels in scientific literacy, by country

1.2 Reading literacy

- ▶ Australia achieved an average score of 503 points in reading literacy, which was significantly higher than the OECD average of 493 points.
- ▶ Australia's performance was significantly below 11 countries (8 OECD: Canada, Estonia, Finland, Ireland, Japan, Korea, New Zealand and Norway; 3 partner: Singapore, Hong Kong (China) and Macao (China)).
- ▶ Australia's performance was not significantly different from that of 13 countries (11 OECD: Belgium, Denmark, France, Germany, the Netherlands, Poland, Portugal, Slovenia, Sweden, the United Kingdom and the United States; 2 partner: Chinese Taipei and B-S-J-G (China)).
- ▶ Australia's performance was significantly higher than the remaining participating countries, which included 15 OECD countries.
- ▶ Singapore was the highest performing country in reading literacy in PISA 2015, with an average score of 535 points, which is 32 points or equivalent to around one year of schooling higher than the Australian average and 44 points higher than the OECD average.
- ▶ The narrowest spread of scores between the lowest and highest achieving students was found in Vietnam (239 points) and the widest spread of scores was found in Malta (395 points). In Australia, the difference between the lowest and highest achieving students was 338 points, which was similar to Austria, Sweden, Cyprus and the Slovak Republic, but wider than the OECD average (315 points).
- ▶ Australia's proportion of high performers (11%) was higher than the OECD average (8%). However, Singapore had the largest proportion of high performers with 18% of their students achieving at this level. Other high-performing countries (Canada, Finland, Hong Kong (China), Korea, New Zealand, and Norway) had between 12% and 14% of high performers. Around 40 countries had fewer than 10% of high performers, and of these countries, around half had fewer than 5% of high performers in reading literacy.
- ▶ On average, 20% of students across OECD countries were low performers. The countries that performed significantly higher than Australia had between 9% and 17% of low performers. Hong Kong (China) and Ireland had 9% and 10% of low performers. Estonia, Canada, Finland, and Singapore had 11% of low performers and Japan, Korea, Norway and New Zealand had between 13% and 17% of low performers. In Australia, 18% of students were low performers, which was also the case for Latvia, the United Kingdom, the Netherlands and Sweden.
- ▶ 61% of Australian students achieved the National Proficient Standard in reading literacy.
- ▶ Figure 1.2 lists the average reading literacy scores, along with the standard errors, confidence intervals around the average, and the difference between the 5th and 95th percentiles. This figure also shows the proportions of high, middle and low performers on the reading literacy scale for countries.

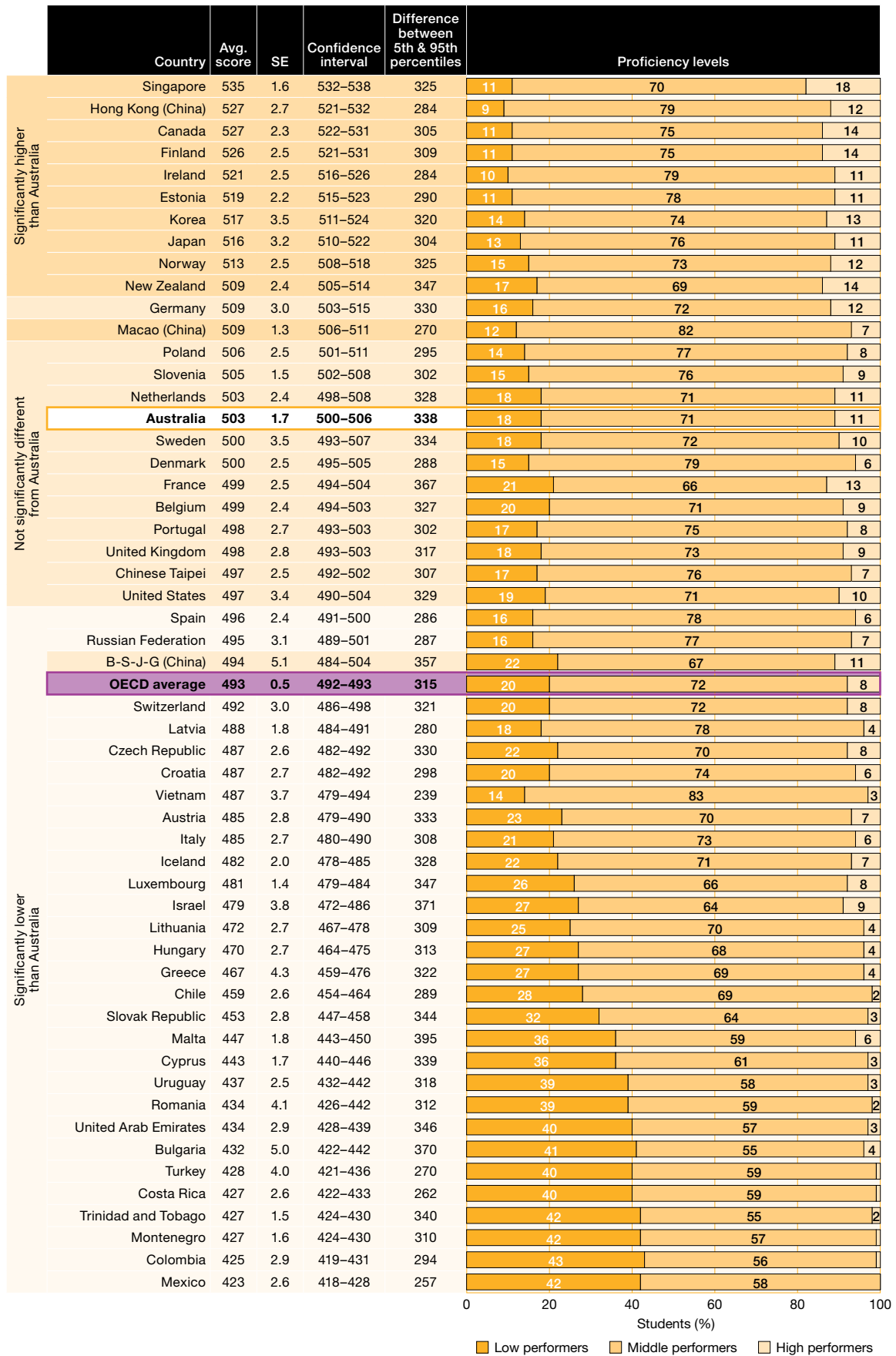


FIGURE 1.2 Average scores and proficiency levels in reading literacy, by country

1.3 Mathematical literacy

- ▶ Australian students achieved an average score of 494 points in mathematical literacy, which was significantly higher than the OECD average of 490 points.
- ▶ Australia's performance was significantly below 19 countries (14 OECD: Japan, Korea, Switzerland, Estonia, Canada, the Netherlands, Denmark, Finland, Slovenia, Belgium, Germany, Poland, Ireland and Norway; 5 partner: Singapore, Hong Kong (China), Macao (China), Chinese Taipei and B-J-S-G (China)).
- ▶ Australia's performance was not significantly different from that of 10 countries (8 OECD: Austria, New Zealand, Sweden, France, the United Kingdom, the Czech Republic, Portugal and Italy; 2 partner: Vietnam and the Russian Federation).
- ▶ Australia's performance was significantly higher than the remaining participating countries, which included 10 OECD countries.
- ▶ Singapore was the highest performing country in mathematical literacy in PISA 2015 with a score of 564 points. Australia's score of 494 points was equivalent to around two-and-a-third years of schooling lower than Singapore's achieved score.
- ▶ The spread between the 5th and 95th percentiles was about mid-range for the OECD average with 293 points. The largest spread in achievement between the lowest and highest achievers was found in Malta (359 points) and B-S-J-G (China) (345 points). The smallest spread between low and high achievers was found in Mexico (248 points) and Latvia (255 points). Among the highest performing countries, the spread between the low and high achievers varied: Singapore's spread was 312 points, Hong Kong (China)'s was 298 points, Macao (China)'s was 261 points and Chinese Taipei's was 337 points. In Australia, there were 306 points between students in the 5th and 95th percentiles.
- ▶ On average, 11% of students across the OECD countries were high performers, which was the same proportion of high performers as Australia, France, Portugal, New Zealand, Norway, the United Kingdom, and Italy. Thirty-five per cent of students in Singapore performed at this level while approximately 25% of students in Chinese Taipei, Hong Kong (China) and B-S-J-G (China), and around 20% of students in Macao (China), Korea and Japan were highly proficient in mathematical literacy. A number of countries had fewer than 3% of high-performing students.
- ▶ On average, 23% of students across OECD countries were low performers. Australia, New Zealand, the United Kingdom, the Czech Republic, Austria and Spain had 22% of low performers. In the high-performing countries, Macao (China), Singapore and Hong Kong (China) had fewer than 10% of low performers on the mathematical literacy proficiency scale. In some low-performing countries, such as Turkey, Montenegro, Trinidad and Tobago, Uruguay, Albania, Thailand and Mexico, more than half the students were low performers.
- ▶ 55% of Australian students achieved the National Proficient Standard in mathematical literacy.
- ▶ Figure 1.3 lists the average mathematical literacy scores, along with the standard errors, confidence intervals around the average, and the difference between the 5th and 95th percentiles. This figure also shows the proportions of high, middle and low performers on the mathematical literacy scale for countries.

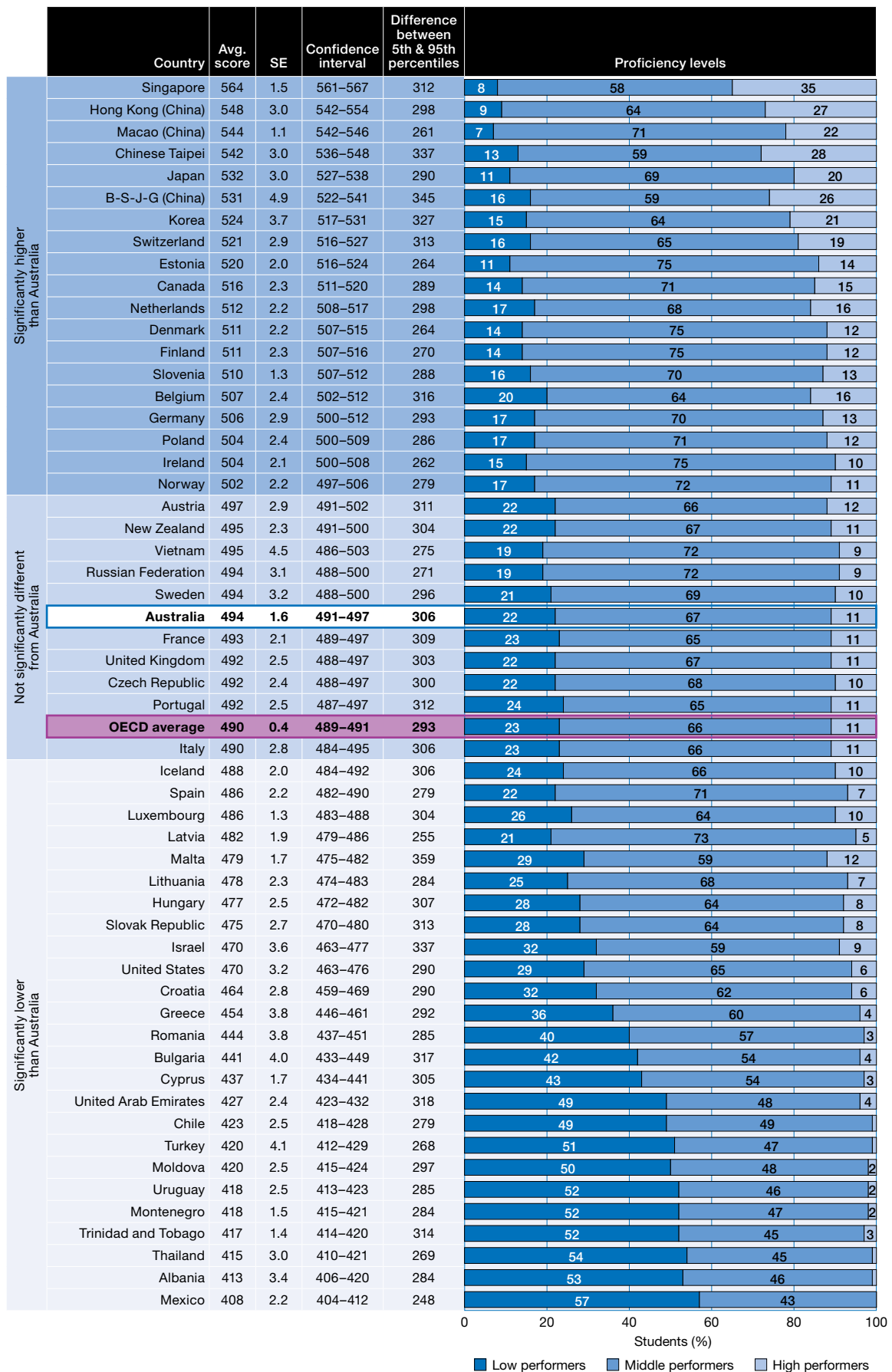


FIGURE 1.3 Average scores and proficiency levels in mathematical literacy, by country

2.1 Scientific literacy

- ▶ The OECD average in PISA 2006 was not significantly different to the OECD average in PISA 2015.
 - ▶ 6 countries (Qatar, Colombia, Portugal, Macao (China), Romania and Norway) significantly improved their performance in scientific literacy between 2006 and 2015.
 - ▶ Australia and 12 countries (Finland, the Slovak Republic, Hungary, Czech Republic, Hong Kong (China), Greece, Croatia, Iceland, New Zealand, the Netherlands, Austria and Lithuania) showed a significant decline in their scientific literacy performance between 2006 and 2015.
 - ▶ Australia's performance in scientific literacy declined significantly by 17 points between 2006 and 2015.
 - ▶ Figure 2.1 shows the average scores for scientific literacy in PISA 2006 and 2015, and graphically shows the difference in average scores between 2006 and 2015.
-
- ▶ Table 2.1 shows a country's relative position to Australia's in scientific literacy performance for PISA 2000 to 2015.⁹
 - ▶ There were 34 countries (21 OECD; 13 partner) whose scientific literacy performances over time have consistently been significantly lower than Australia's.
 - ▶ The performances of Finland, Hong Kong (China), Shanghai (China) and Singapore have been consistently significantly higher than Australia's.
 - ▶ The performances of the Netherlands and Liechtenstein have consistently not been significantly different to Australia's.
 - ▶ The relative performances of a number of countries to Australia have changed over time:
 - Canada's performance was significantly higher than Australia's in 2006 and 2015; however, its performance was not significantly different to Australia's in 2009 and 2012.
 - Macao (China) performed significantly lower in 2006 and 2009, and not significantly different to Australia (in 2012) but performed significantly higher than Australia in 2015.
 - Japan's, Estonia's and Chinese Taipei's performances in 2006 were on par with Australia's, but each country's performance was significantly higher in 2015.
 - Germany, Slovenia, Switzerland and the United Kingdom performed significantly lower in PISA 2006; however, each of their performances in 2015 was not significantly different to Australia's.
 - Korea's and New Zealand's performances in 2006 and 2015 were not significantly different to Australia's.

⁹ With the exceptions of Liechtenstein, Serbia and Shanghai (China), which are placed at the bottom of the table as they did not participate in PISA 2015, or did not participate in PISA 2015 as the same entity.



Note: only countries that participated in PISA cycles in 2006 and 2015 are shown.

■ Performance between 2006 and 2015 significantly different
□ Performance between 2006 and 2015 not significantly different

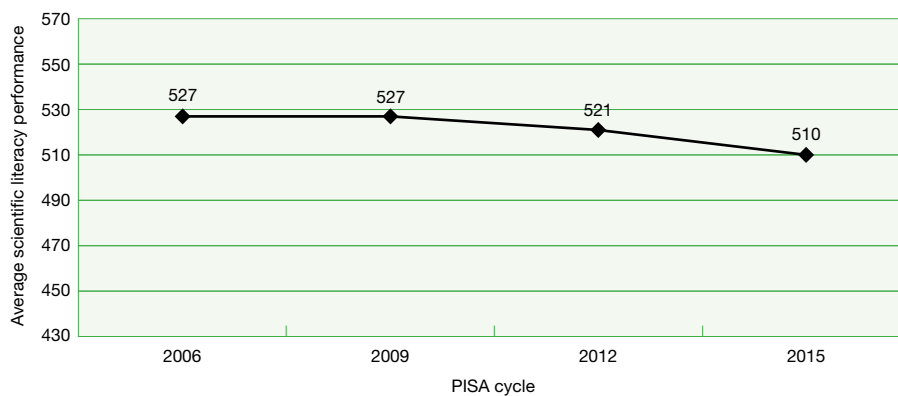
FIGURE 2.1 Average scientific literacy performance scores for PISA 2006 and 2015 and the differences between these two cycles, by country

TABLE 2.1 Relative trends in scientific literacy performance, by country

Country	Position relative to Australia in			
	PISA 2015	PISA 2012	PISA 2009	PISA 2006
Singapore	▲	▲	▲	–
Japan	▲	▲	▲	●
Estonia	▲	▲	●	●
Chinese Taipei	▲	●	●	●
Finland	▲	▲	▲	▲
Macao (China)	▲	●	▼	▼
Canada	▲	●	●	▲
Hong Kong (China)	▲	▲	▲	▲
Korea	●	▲	▲	●
New Zealand	●	▼	●	●
Slovenia	●	▼	▼	▼
Australia				
United Kingdom	●	●	▼	▼
Germany	●	●	●	▼
Netherlands	●	●	●	●
Switzerland	●	●	▼	▼
Ireland	▼	●	▼	▼
Belgium	▼	▼	▼	▼
Denmark	▼	▼	▼	▼
Poland	▼	●	▼	▼
Portugal	▼	▼	▼	▼
Norway	▼	▼	▼	▼
United States	▼	▼	▼	▼
Austria	▼	▼	–	▼
France	▼	▼	▼	▼
Sweden	▼	▼	▼	▼
Czech Republic	▼	▼	▼	▼
Spain	▼	▼	▼	▼
Latvia	▼	▼	▼	▼
Russian Federation	▼	▼	▼	▼
Luxembourg	▼	▼	▼	▼
Italy	▼	▼	▼	▼
Hungary	▼	▼	▼	▼
Lithuania	▼	▼	▼	▼
Croatia	▼	▼	▼	▼
Iceland	▼	▼	▼	▼
Israel	▼	▼	▼	▼
Slovak Republic	▼	▼	▼	▼
Greece	▼	▼	▼	▼
Chile	▼	▼	▼	▼
Bulgaria	▼	▼	▼	▼
United Arab Emirates	▼	▼	▼	–
Uruguay	▼	▼	▼	▼
Romania	▼	▼	▼	▼
Albania	▼	▼	▼	–
Turkey	▼	▼	▼	▼
Thailand	▼	▼	▼	▼
Costa Rica	▼	▼	▼	–
Qatar	▼	▼	▼	▼
Colombia	▼	▼	▼	▼
Mexico	▼	▼	▼	▼
Liechtenstein	–	●	●	●
Serbia	–	▼	▼	▼
Shanghai (China)	–	▲	▲	–

Note: ▲ Score significantly higher than Australia's
● Score not significantly different to Australia's
▼ Score significantly lower than Australia's
– Did not participate in this cycle or comparisons cannot be made
B-S-J-G (China), Cyprus, Malta, Trinidad and Tobago, and Vietnam are not included in this table.

- ▶ Figure 2.2 shows Australia's performance in scientific literacy across four PISA cycles, from 2006 to 2015.
- ▶ Between 2006 and 2015, Australia's average score in scientific literacy declined significantly by 17 points; from 2012 to 2015 there was a significant decline of 12 points.



	Difference between years					
	2012		2009		2006	
2015	-12	▼	-17	▼	-17	▼
2012			-6		-5	
2009					0	

Note: read across the table row to determine whether the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

FIGURE 2.2 Average scientific literacy performance and differences over time, for Australia

- ▶ Figure 2.3 shows the proportions of low and high performers for countries that participated in PISA cycles 2006 and 2015.
- ▶ For 7 countries in PISA 2015 (Australia, the Czech Republic, Greece, Finland, Hungary, New Zealand and the Slovak Republic), there were significantly higher proportions of low performers and a significantly lower proportion of high performers. The increase in low performers ranged from 4% in New Zealand to 11% in the Slovak Republic and Hungary. In Australia, there was a 5% increase in the proportion of low performers to 18% in 2015. The decrease in high performers ranged from 1% in Greece to 5% in New Zealand. In Australia, the proportion of high performers declined by 3% to 11% in 2015.
- ▶ In Macao (China), Portugal and Qatar, there were significantly lower proportions of low performers and significantly higher proportions of high performers in 2015 than in 2006. The decline for low performers ranged from 2% in Macao (China) to 29% in Qatar, while the increase for high performers was 1% in Qatar to 4% in Macao (China) and Portugal.
- ▶ Six countries (Austria, Hong Kong (China), Iceland, Ireland, Slovenia and the United Kingdom) experienced a significant decline in the proportions of high performers between 2006 and 2015. The decline of high performers ranged from 2% in Austria, Ireland and Slovenia to 9% in Hong Kong (China).
- ▶ Four countries experienced significant changes in the proportions of low performers between 2006 and 2015. In Sweden, the Netherlands and Croatia, there were significant increases in the proportions of low performers, which ranged from 5% in Sweden to 8% in Croatia, while in Colombia, the proportion of low performers significantly decreased by 11%.
- ▶ Figure 2.4 provides more details about the proportion of students in each of the proficiency levels for the four PISA cycles for Australia.
- ▶ Between 2006 and 2012, the proportion of low- and high-performing students remained constant; however, from 2012 to 2015, there was a 3% decrease in the proportion of high performers and a 4% increase in the proportion of low performers.

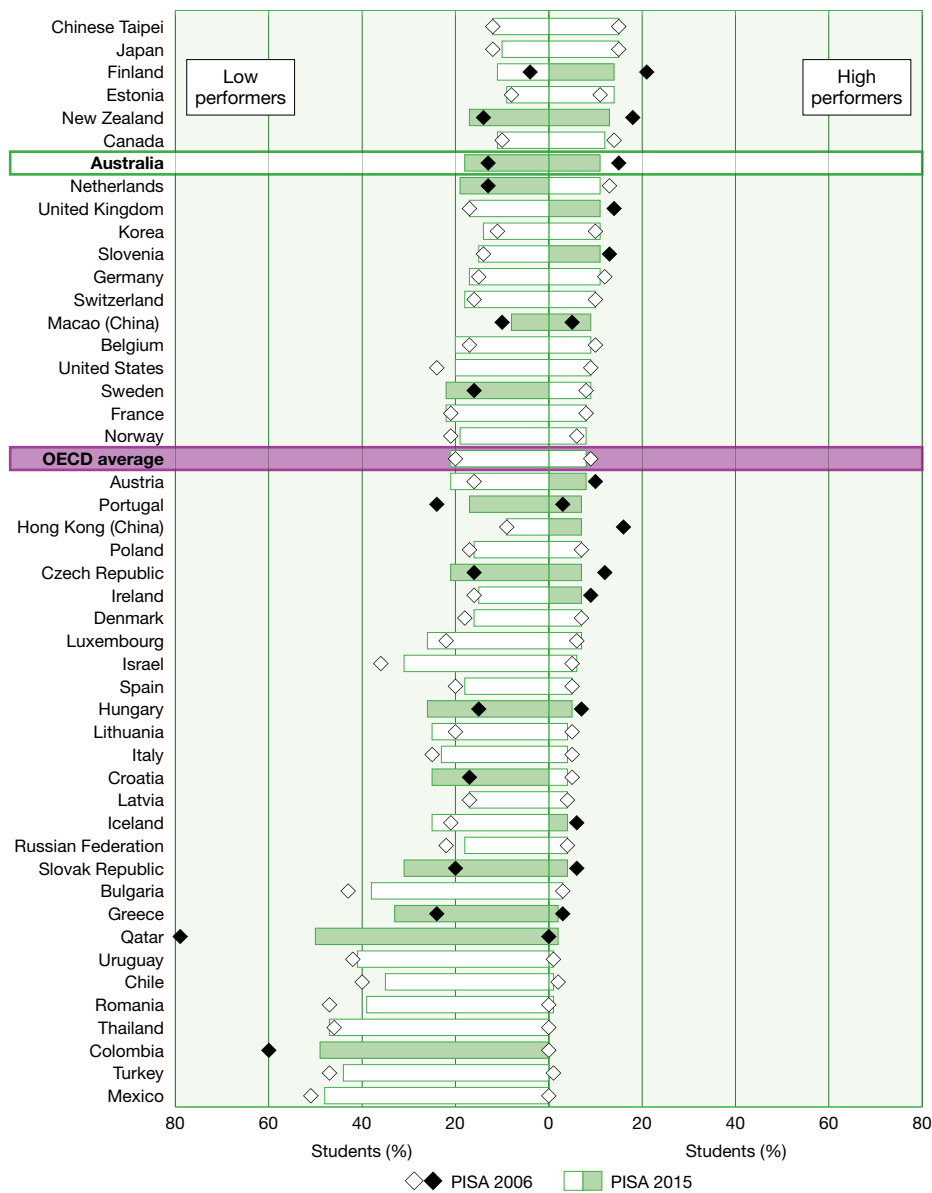


FIGURE 2.3 Percentage of low and high performers in scientific literacy for PISA 2006 and 2015, by country

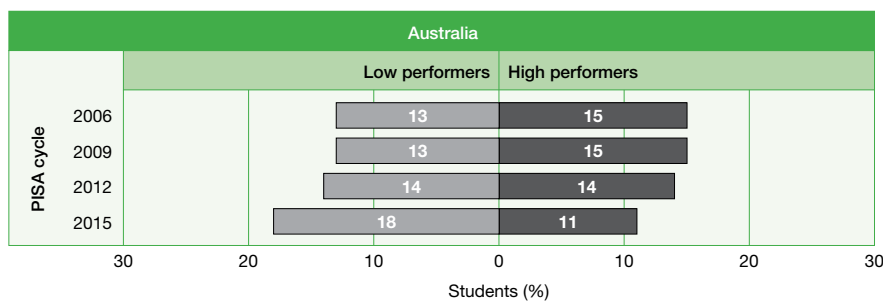


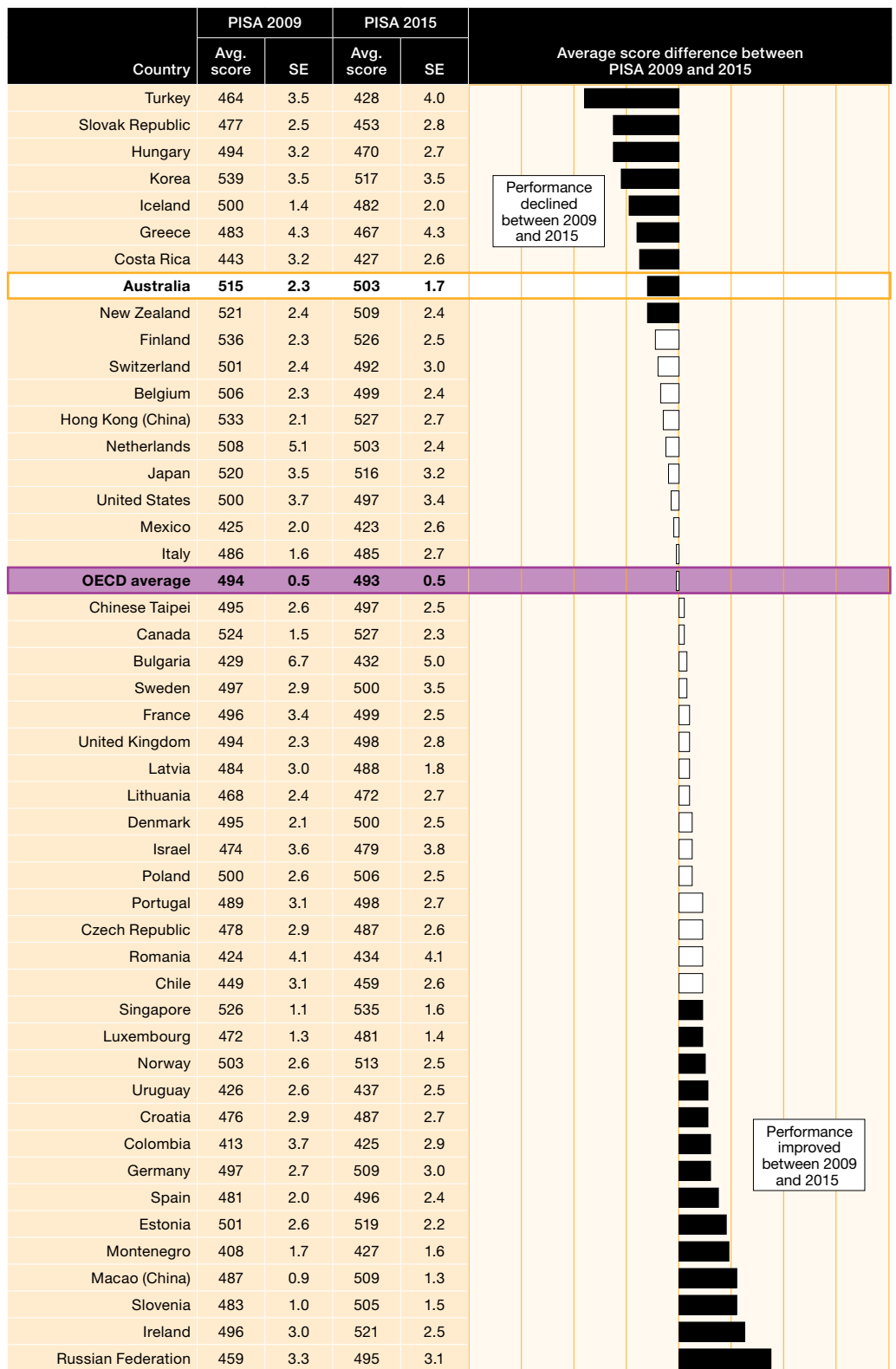
FIGURE 2.4 Percentage of low and high performers across the scientific literacy proficiency scale over time, for Australia

2.2 Reading literacy

- ▶ The OECD average in 2009 was not significantly different to the OECD average in 2015.
 - ▶ Between 2009 and 2015, 14 countries (the Russian Federation, Ireland, Slovenia, Macao (China), Montenegro, Estonia, Spain, Germany, Colombia, Croatia, Uruguay, Norway, Luxembourg and Singapore) showed significant improvements in their reading literacy performances.
 - ▶ The reading literacy performance for Australia and 8 countries (Turkey, the Slovak Republic, Hungary, Korea, Iceland, Greece, Costa Rica and New Zealand) declined significantly between 2009 and 2015.
 - ▶ Australia's performance in reading literacy declined significantly by 12 points between 2009 and 2015.
 - ▶ The average scores for reading literacy in PISA 2009 and 2015 and the difference in average scores between 2009 and 2015 for countries are shown in Figure 2.5.
-
- ▶ Table 2.2 shows a country's relative position to Australia's in reading literacy performance for PISA 2000 to 2015.¹⁰
 - ▶ There were 25 countries (14 OECD; 11 partner), for which reading literacy performances over time have consistently been significantly lower than Australia's.¹¹
 - ▶ In PISA, the performances of Finland, Shanghai (China) and Singapore have been consistently significantly higher than Australia's.
 - ▶ The relative performances of a number of countries to Australia have changed over time:
 - In 2000, Canada, Hong Kong (China), Ireland Japan, Korea, and New Zealand performed on par with Australia; however, in 2015 their performances were significantly higher than Australia's.
 - Estonia, Macao (China), and Norway's performances in their first PISA cycle was significantly lower than Australia's; however, in 2015, their performance was significantly higher than Australia's.
 - In 13 countries (11 OECD: Belgium, Denmark, France, Germany, the Netherlands, Poland, Portugal, Slovenia, Sweden, the United Kingdom and the United States; 2 partner: Chinese Taipei and Liechtenstein), the performances in reading literacy were initially significantly lower than Australia's; however, in their last participation in PISA, their performances were not significantly different to Australia's.

¹⁰ With the exceptions of Liechtenstein, Serbia and Shanghai (China), which are placed at the bottom of the table as they did not participate in PISA 2015, or did not participate in PISA 2015 as the same entity.

¹¹ With the exception of PISA 2012, in which Switzerland's performance was not significantly different to Australia's.



Note: only countries that participated in PISA cycles in 2009 and 2015 are shown.

80 60 40 20 0 20 40 60 80

■ Performance between 2009 and 2015 significantly different

□ Performance between 2009 and 2015 not significantly different

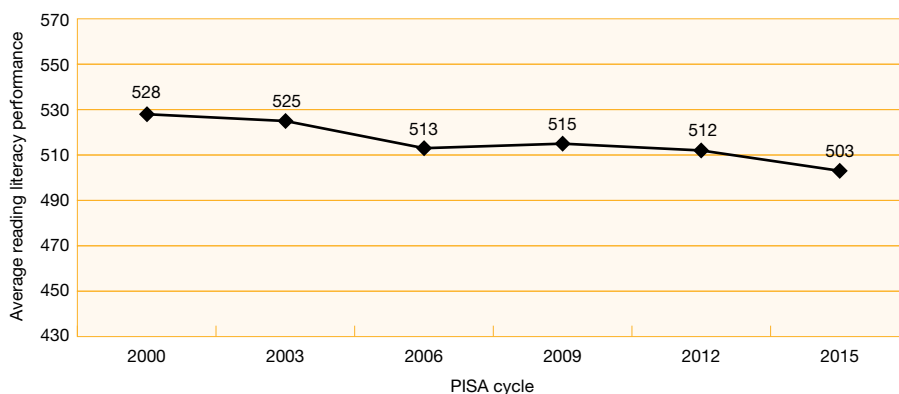
FIGURE 2.5 Average reading literacy performance scores for PISA 2009 and 2015 and the differences between these two cycles, by country

TABLE 2.2 Relative trends in reading literacy performance, by country

Country	Position relative to Australia in					
	PISA 2015	PISA 2012	PISA 2009	PISA 2006	PISA 2003	PISA 2000
Singapore	▲	▲	▲	–	–	–
Hong Kong (China)	▲	▲	▲	▲	▼	●
Canada	▲	▲	▲	▲	●	●
Finland	▲	▲	▲	▲	▲	▲
Ireland	▲	▲	▼	●	▼	●
Estonia	▲	●	▼	▼	–	–
Korea	▲	▲	▲	▲	▲	●
Japan	▲	▲	●	▼	▼	●
Norway	▲	▼	▼	▼	▼	▼
New Zealand	▲	●	●	▲	●	●
Germany	●	●	▼	▼	▼	▼
Macao (China)	▲	●	▼	▼	▼	–
Poland	●	●	▼	●	▼	▼
Slovenia	●	▼	▼	▼	–	–
Netherlands	●	●	●	●	▼	–
Australia						
Sweden	●	▼	▼	●	▼	▼
Denmark	●	▼	▼	▼	▼	▼
France	●	●	▼	▼	▼	▼
Belgium	●	●	▼	▼	▼	▼
Portugal	●	▼	▼	▼	▼	▼
United Kingdom	●	▼	▼	▼	–	–
Chinese Taipei	●	▲	▼	▼	–	–
United States	●	▼	▼	–	▼	▼
Spain	▼	▼	▼	▼	▼	▼
Russian Federation	▼	▼	▼	▼	▼	▼
Switzerland	▼	●	▼	▼	▼	▼
Latvia	▼	▼	▼	▼	▼	▼
Czech Republic	▼	▼	▼	▼	▼	▼
Croatia	▼	▼	▼	▼	–	–
Austria	▼	▼	–	▼	▼	▼
Italy	▼	▼	▼	▼	▼	▼
Iceland	▼	▼	▼	▼	▼	▼
Luxembourg	▼	▼	▼	▼	▼	–
Israel	▼	▼	▼	▼	–	▼
Lithuania	▼	▼	▼	▼	–	–
Hungary	▼	▼	▼	▼	▼	▼
Greece	▼	▼	▼	▼	▼	▼
Chile	▼	▼	▼	▼	–	▼
Slovak Republic	▼	▼	▼	▼	▼	–
Uruguay	▼	▼	▼	▼	▼	–
Romania	▼	▼	▼	▼	–	▼
United Arab Emirates	▼	▼	▼	–	–	–
Bulgaria	▼	▼	▼	▼	–	▼
Turkey	▼	▼	▼	▼	▼	–
Costa Rica	▼	▼	▼	–	–	–
Montenegro	▼	▼	▼	▼	–	–
Colombia	▼	▼	▼	▼	–	–
Mexico	▼	▼	▼	▼	▼	▼
Liechtenstein	–	●	▼	●	●	▼
Serbia	–	▼	▼	▼	–	–
Shanghai (China)	–	▲	▲	–	–	–

Note: ▲ Score significantly higher than Australia's
● Score not significantly different to Australia's
▼ Score significantly lower than Australia's
– Did not participate in this cycle or comparisons cannot be made
B-S-J-G (China), Cyprus, Malta, Trinidad and Tobago, and Vietnam are not included in this table.

- ▶ Figure 2.6 shows Australia's performance in reading literacy across six PISA cycles, from 2000 to 2015.
- ▶ In 2000, when the majority of the assessment time was devoted to reading literacy, Australia achieved an average score of 528 points.
- ▶ In 2009, when reading literacy was next assessed as the major domain, Australia's performance was an average of 515 points, which was a significant decline of 13 points.
- ▶ In 2015, Australia achieved an average score of 503 points, which was significantly lower (by 12 points) than the average score achieved in 2009, and significantly lower (by 25 points) than the average score achieved in 2000.



	Difference between years				
	2012	2009	2006	2003	2000
2015	-9	-12 ▼	-10	-23 ▼	-25 ▼
2012		-3	-1	-14 ▼	-16 ▼
2009			2	-11 ▼	-13 ▼
2006				-13 ▼	-15 ▼
2003					-3

Note: read across the table row to determine whether the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

FIGURE 2.6 Average reading literacy performance and differences over time, for Australia

- ▶ Figure 2.7 shows the proportion of low and high performers for PISA 2009 and PISA 2015 in reading literacy.
- ▶ In 7 countries (Estonia, Ireland, Macao (China), Montenegro, the Russian Federation, Slovenia and Spain), the proportions of low performers decreased significantly and the proportions of high performers increased significantly, that is, there were fewer low performers and more high performers in 2015 than in 2009. The improvement in the proportions of low performers ranged from 3% in Estonia, Macao (China) and Spain to 11% in the Russian Federation while the decline in the proportions of high performers ranged from 1% in Montenegro to 5% in Estonia.
- ▶ In 4 countries (Greece, Hungary, Iceland and Turkey), the proportions of low performers significantly increased and the proportions of high performers significantly decreased, that is, there were more low performers and fewer high performers in 2015 than in 2009. The decline in the proportions of low performers ranged from 5% in Iceland to 15% in Turkey, whereas the decline in the proportions of high performers ranged from 1% in Turkey to 2% in Greece, Hungary and Iceland.

- ▶ In 5 countries (Australia, Finland, Korea, New Zealand and the Slovak Republic), there were significantly higher proportions of low performers in 2015 than in 2009. The increase in the proportions of low performers ranged from 3% in New Zealand and Finland to 10% in the Slovak Republic. In Australia, there was a 4% increase in the proportion of low performers, from 14% in 2009 to 18% in 2015.
- ▶ 14 countries (Chile, Croatia, the Czech Republic, Denmark, France, Germany, Latvia, Lithuania, Luxembourg, Malta, Norway, Portugal, Romania, and Singapore) significantly increased their proportions of high performers between 2009 and 2015. The increase in the proportions of high performers ranged from 1% in Chile, Malta, Romania and Latvia to 4% in Germany and Norway.

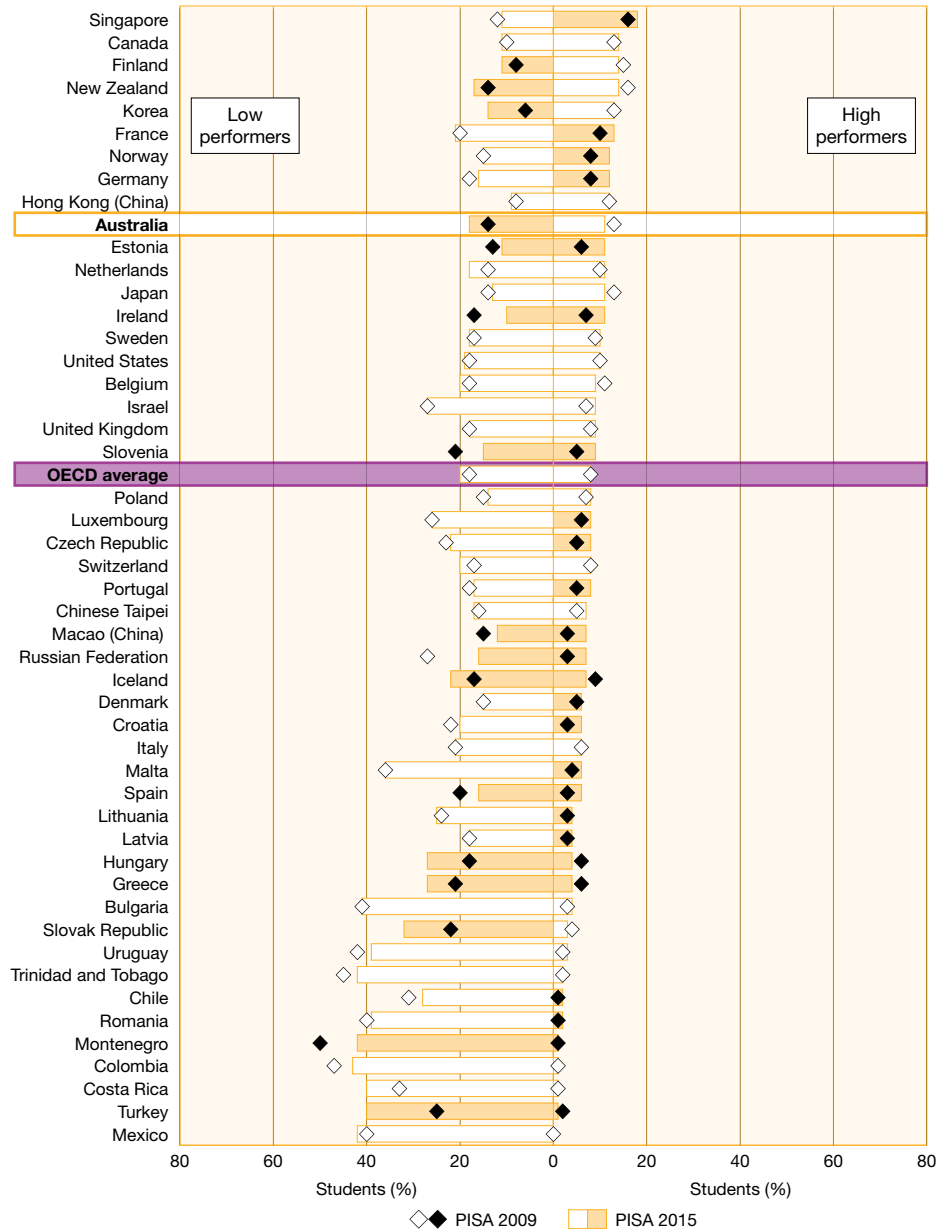


FIGURE 2.7 Percentage of low and high performers in reading literacy for PISA 2009 and 2015, by country

- ▶ Figure 2.8 provides details about the proportions of low and high performers for Australia across the six PISA cycles reporting reading literacy and shows that there has been a downward shift, with fewer high performers and more low performers.
- ▶ Between 2000 and 2009 (when reading literacy was assessed as the major domain), the proportion of low performers increased by 2% and the proportion of high performers declined by 4%.
- ▶ Between 2009 and 2015, a similar pattern was observed with an increase in the proportion of low performers (by 4%) and a decline in the proportion of high performers (by 2%).

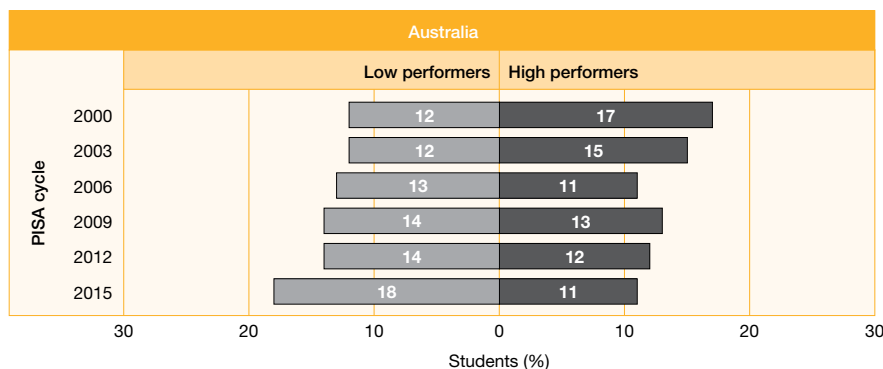


FIGURE 2.8 Percentage of low and high performers across the reading literacy proficiency scale over time, for Australia

2.3 Mathematical literacy

- ▶ The OECD average in 2012 was not significantly different to the OECD average in 2015.
- ▶ Between 2012 and 2015, 8 countries (Albania, Sweden, Norway, the Russian Federation, Denmark, Slovenia, Uruguay and Montenegro) showed significant improvement in their mathematical literacy performances.
- ▶ Australia was one of 10 countries whose performance declined significantly between 2012 and 2015. The other countries were Singapore, the Netherlands, the United States, Poland, Hong Kong (China), Vietnam, Chinese Taipei, Turkey and Korea.
- ▶ Between 2012 and 2015, Australia's performance in mathematical literacy declined significantly by 10 points.
- ▶ Figure 2.9 shows countries' average scores for mathematical literacy in PISA 2012 and 2015 and the average score difference between these two cycles.
- ▶ Table 2.3 shows a country's relative position to Australia's in mathematical literacy performance for PISA 2003 to 2015.¹²
- ▶ There were 22 countries (12 OECD; 10 partner) whose performances have been consistently significantly lower than Australia's across the PISA cycles.
- ▶ There were 10 countries (5 OECD; 5 partner) whose performances have been consistently significantly higher than Australia's in PISA.¹³

¹² With the exceptions of Liechtenstein, Serbia and Shanghai (China), which are placed at the bottom of the table as they did not participate in PISA 2015, or did not participate in PISA 2015 as the same entity.

¹³ With the exception of PISA 2006, in which Japan's and Liechtenstein's performances were not significantly different to Australia's.

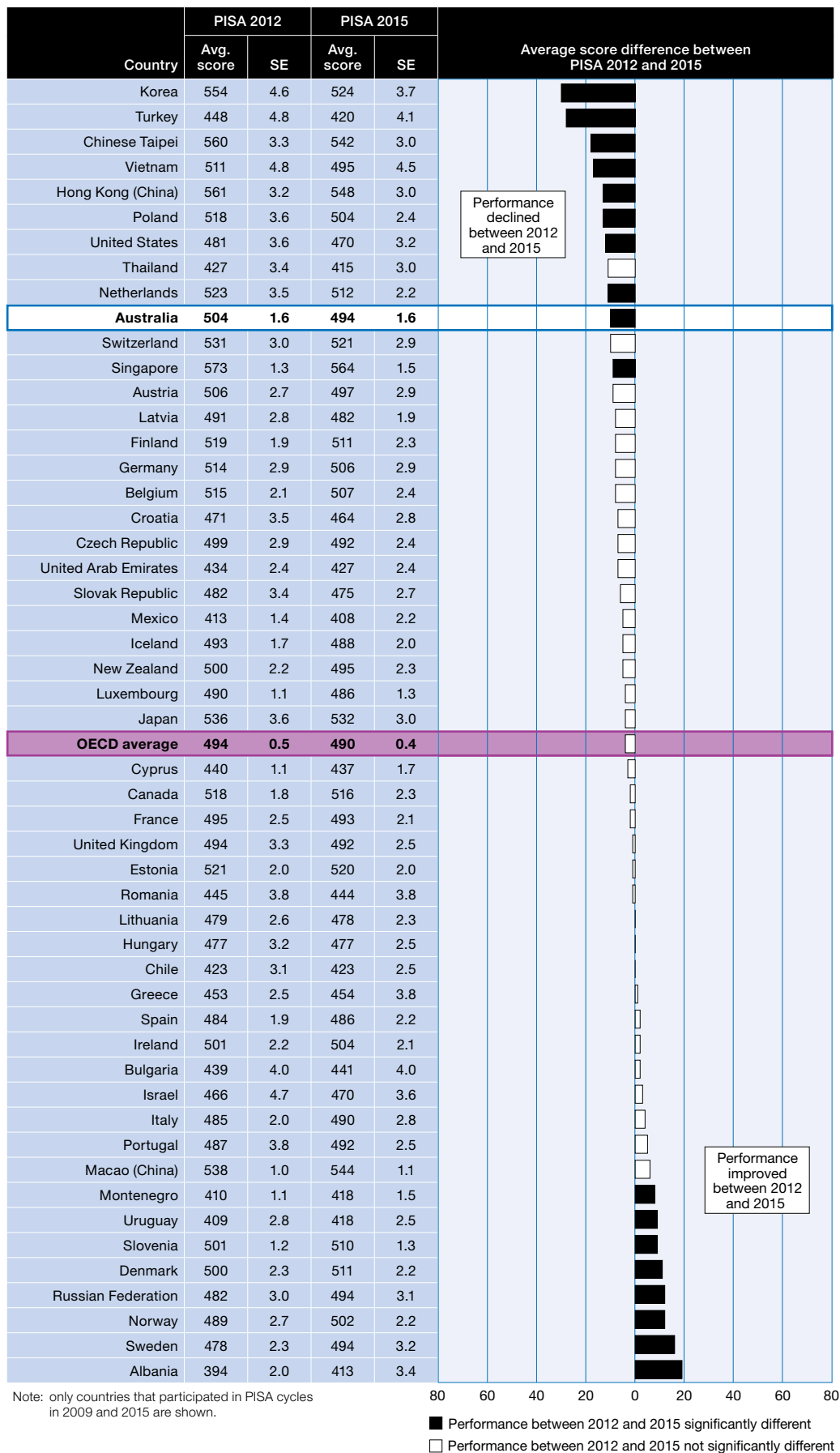


FIGURE 2.9 Average mathematical literacy performance scores for PISA 2012 and 2015 and the differences between these two cycles, by country

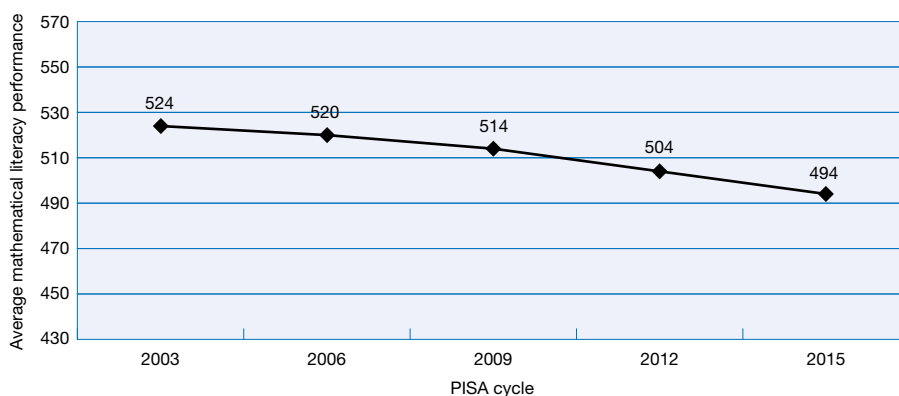
TABLE 2.3 Relative trends in mathematical literacy performance, by country

Country	Position relative to Australia in				
	PISA 2015	PISA 2012	PISA 2009	PISA 2006	PISA 2003
Singapore	▲	▲	▲	—	—
Hong Kong (China)	▲	▲	▲	▲	▲
Macao (China)	▲	▲	▲	▲	●
Chinese Taipei	▲	▲	▲	▲	—
Japan	▲	▲	▲	●	▲
Korea	▲	▲	▲	▲	▲
Switzerland	▲	▲	▲	▲	●
Estonia	▲	▲	●	●	—
Canada	▲	▲	▲	▲	▲
Netherlands	▲	▲	▲	▲	▲
Denmark	▲	●	▼	▼	▼
Finland	▲	▲	▲	▲	▲
Slovenia	▲	●	▼	▼	—
Belgium	▲	▲	●	●	●
Germany	▲	▲	●	▼	▼
Poland	▲	▲	▼	▼	▼
Ireland	▲	●	▼	▼	▼
Norway	▲	▼	▼	▼	▼
Austria	●	●	—	▼	▼
New Zealand	●	●	●	●	●
Russian Federation	●	▼	▼	▼	▼
Sweden	●	▼	▼	▼	▼
Australia					
France	●	▼	▼	▼	▼
United Kingdom	●	▼	▼	▼	—
Czech Republic	●	●	▼	▼	●
Portugal	●	▼	▼	▼	▼
Italy	●	▼	▼	▼	▼
Iceland	▼	▼	▼	▼	▼
Spain	▼	▼	▼	▼	▼
Luxembourg	▼	▼	▼	▼	▼
Latvia	▼	▼	▼	▼	▼
Lithuania	▼	▼	▼	▼	—
Hungary	▼	▼	▼	▼	▼
Slovak Republic	▼	▼	▼	▼	▼
Israel	▼	▼	▼	▼	—
United States	▼	▼	▼	▼	▼
Croatia	▼	▼	▼	▼	—
Greece	▼	▼	▼	▼	▼
Romania	▼	▼	▼	▼	—
Bulgaria	▼	▼	▼	▼	—
United Arab Emirates	▼	▼	▼	—	—
Chile	▼	▼	▼	▼	—
Turkey	▼	▼	▼	▼	▼
Uruguay	▼	▼	▼	▼	▼
Montenegro	▼	▼	▼	▼	—
Thailand	▼	▼	▼	▼	▼
Albania	▼	▼	▼	—	—
Mexico	▼	▼	▼	▼	▼
Liechtenstein	—	▲	▲	●	▲
Serbia	—	▼	▼	▼	—
Shanghai (China)	—	▲	▲	—	—

Note: ▲ Score significantly higher than Australia
● Score not significantly different to Australia's
▼ Score significantly lower than Australia's
— Did not participate in this cycle or comparisons cannot be made
B-S-J-G (China), Cyprus, Malta, Trinidad and Tobago, and Vietnam are not included in this table.

- ▶ A number of countries whose relative performances to Australia have changed over the PISA cycles:
 - the performances of 4 countries (3 OECD: Belgium, Estonia and Switzerland; 1 partner: Macao (China)) in their first PISA cycle were not significantly different to Australia's; however, in 2015, these countries' performances were significantly higher than Australia's.
 - the performances of 6 OECD countries (Denmark, Germany, Ireland, Norway, Poland and Slovenia) in their first PISA cycle were significantly lower than Australia's; however, in 2015, these countries' performances were significantly higher than Australia's.
 - the performances of 7 countries (6 OECD: Austria, France, Italy, Portugal, Sweden and the United Kingdom; 1 partner: the Russian Federation) in earlier PISA cycles were significantly lower than Australia's; however, their performances in 2015 were not significantly different to Australia's.
 - there were 2 OECD countries (the Czech Republic and New Zealand) whose performances in 2003 and in 2015 were not significantly different to Australia's.

- ▶ Figure 2.10 shows Australia's performance in mathematical literacy, from 2003 to 2015.
- ▶ In 2003, when mathematical literacy was first assessed as the major domain, Australia achieved an average score of 524 points.
- ▶ Between 2003 and 2006, and between 2006 and 2009, the changes in performance were not significant, whereas between 2009 and 2012, there was a significant decline (by 10 points) in performance, and between 2012 and 2015, there was a further decline in performance (by 10 points), which was also significant.
- ▶ Between 2003 and 2015, mathematical literacy performance declined by 30 points to an average score of 494 points in 2015.



	Difference between years			
	2012	2009	2006	2003
2015	-10 ▼	-20 ▼	-26 ▼	-30 ▼
2012		-10 ▼	-16 ▼	-20 ▼
2009			-6	-10 ▼
2006				-4

Note: read across the table row to determine whether the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

FIGURE 2.10 Average mathematical literacy performance and differences over time, for Australia

- ▶ Figure 2.11 shows the proportion of low and high performers in mathematical literacy for PISA 2012 and 2015 for countries that participated in both cycles.
 - ▶ Across the OECD countries, there was no change in the proportion of low performers, while there was a 2% decrease in the proportion of high performers, which was significant between 2012 and 2015.
 - ▶ In Sweden, there was a significant decrease in the proportion of low performers and there was a significant increase in the proportion of high performers, that is, there were fewer low performers and more high performers in 2015 than in 2012.
 - ▶ In 2015, in Korea and Turkey, there were significant increases in the proportions of low performers and there were significant decreases in the proportions of high performers than in 2012.
 - ▶ The proportions of low performers in 5 countries (Albania, Macao (China), Norway, the Russian Federation and Slovenia) decreased significantly between 2012 and 2015. This decrease ranged from 4% in Macao (China) and Slovenia to 7% in Albania.
 - ▶ The proportions of high performers in 12 countries (Australia, Belgium, Chinese Taipei, Finland, Germany, Hong Kong (China), Latvia, Mexico, New Zealand, Poland, the Slovak Republic and the United States) declined significantly. The decrease in the proportions of high performers ranged from 0.3% in Mexico to 9% in Chinese Taipei. In Australia, the proportion of high performers between 2012 and 2015 fell by 3%.
 - ▶ Switzerland has experienced a 3% increase in proportion of low performers.
-
- ▶ Figure 2.12 shows the proportions of low and high performers on the mathematical literacy proficiency scale from PISA 2003 to 2015.
 - ▶ Between 2003 and 2015, there was an increase in the proportion of low performers. In 2003, the proportion was 14%. Since then, the proportion in each PISA cycle has increased to 22% in 2015. In 12 years, the proportion of low-performing Australian students in mathematical literacy has increased by 8%.
 - ▶ Between 2003 and 2015, there was a decrease in the proportion of high performers. In 2003, the proportion was 20%. Since then, the proportion has decreased to 11% in 2015. In 12 years, the proportion of high-performing Australian students in mathematical literacy has decreased by 9%.

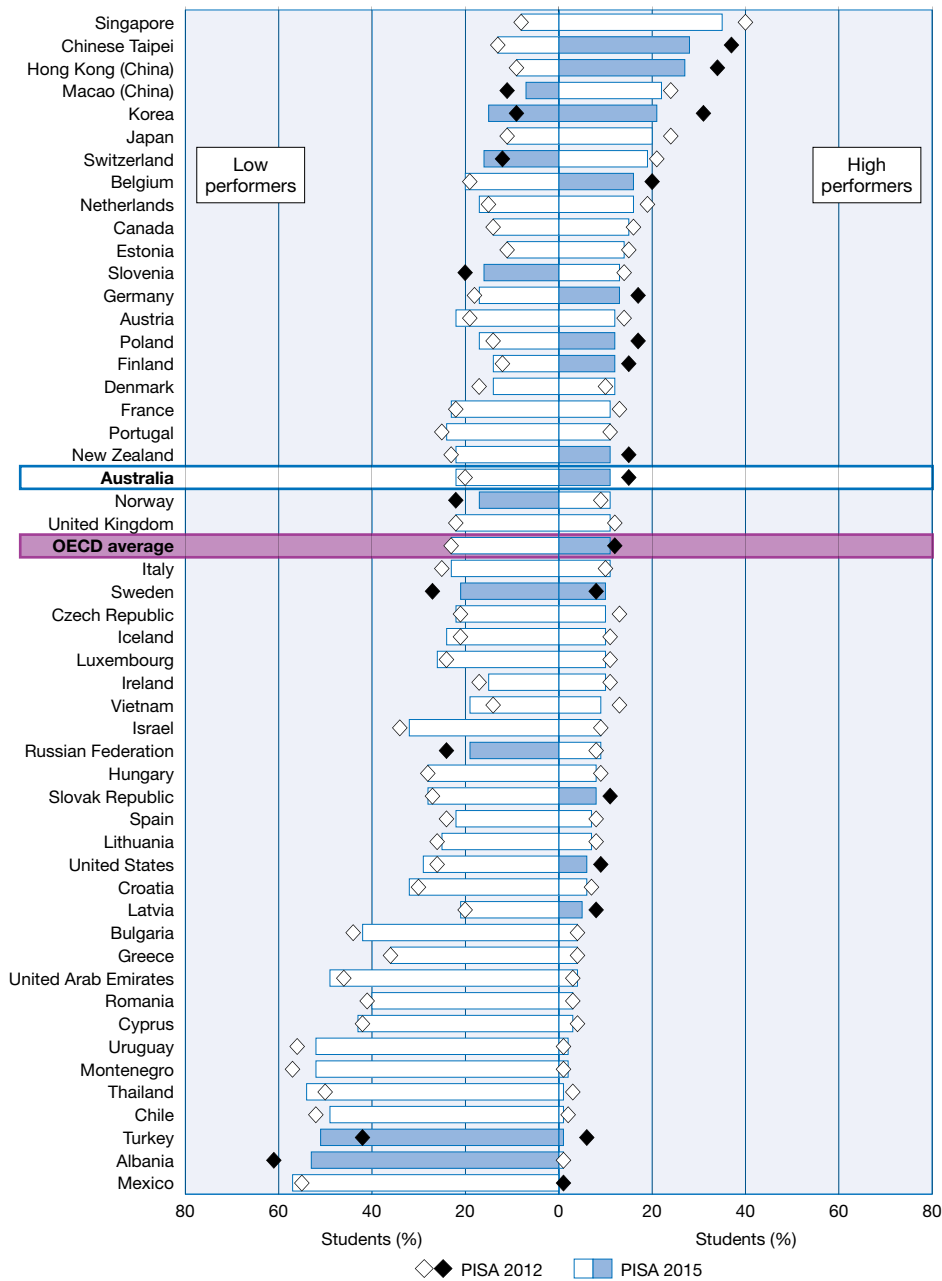


FIGURE 2.11 Percentage of low and high performers in mathematical literacy for PISA 2012 and 2015, by country

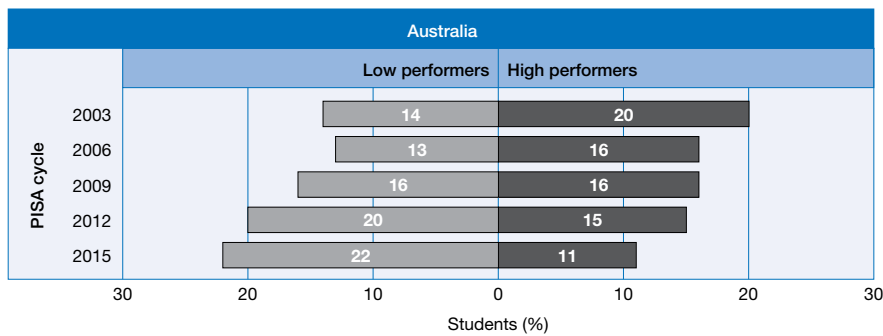


FIGURE 2.12 Percentage of low and high performers across the mathematical literacy proficiency scale over time, for Australia

3.1 Scientific literacy

- ▶ Across the OECD countries, the average score for females was 491 points and for males was 495 points, which is a significant difference of 4 points.
- ▶ Females significantly outperformed males in 16 countries, with the largest differences found in Trinidad and Tobago, Qatar, Albania and the United Arab Emirates, where females scored on average 20 points or more higher than males.
- ▶ Males performed significantly higher than females in 20 countries. The largest differences were found in Chile, Italy, Costa Rica and Austria, where males scored 15 points or more higher than females.
- ▶ In Australia, females scored 509 points on average, which was not significantly different to the average score of 511 points for males.
- ▶ Figure 3.1 provides the average scores and standard errors for females and males on the scientific literacy scale, graphs the difference by sex and indicates whether the difference is statistically significant.

3.2 Reading literacy

- ▶ Across the OECD countries, the average score for females was 506 points and for males was 479 points, which is a significant difference of 27 points.
- ▶ In all participating countries, females performed significantly higher than males in reading literacy. Countries with the largest differences by sex were Cyprus, Trinidad and Tobago, the United Arab Emirates, Bulgaria and Finland, where females scored on average 47 points or more higher than males.
- ▶ In Australia, females scored 519 points on average, which was significantly higher than the average score of 487 points for males. This difference represents around half of a proficiency level, which is equivalent to about one year of schooling.
- ▶ Figure 3.2 provides the average scores and standard errors for females and males on the reading literacy scale, graphs the difference by sex and indicates whether the difference is statistically significant.

3.3 Mathematical literacy

- ▶ Across the OECD countries, the average score for females was 486 points and for males was 494 points, which is a significant difference of 8 points.
- ▶ Females significantly outperformed males in 4 countries (Albania, Finland, Macao (China), and Trinidad and Tobago), with the largest difference found in Trinidad and Tobago where females scored 18 points higher than males.
- ▶ Males significantly outperformed females in 20 countries with the largest differences found in Italy and Austria where males scored on average 20 points or more higher than females.
- ▶ In Australia, females scored 491 points on average, which was not significantly different to the average score of 497 points for males.
- ▶ Figure 3.3 provides the average scores and standard errors for females and males on the mathematical literacy scale, graphs the difference by sex and indicates whether the difference is statistically significant.

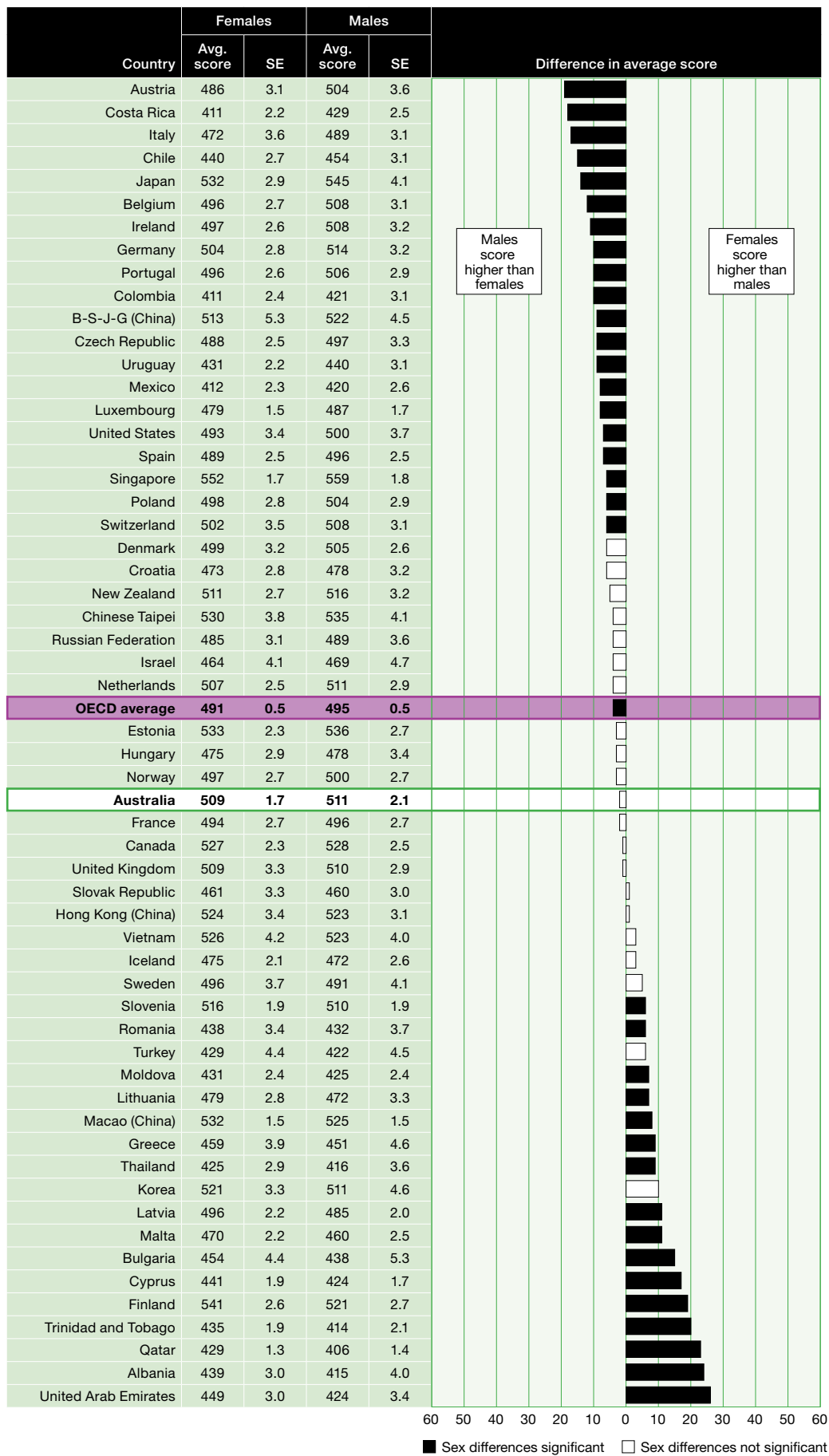


FIGURE 3.1 Average scores and differences in students' performance on the scientific literacy scale, by country and sex

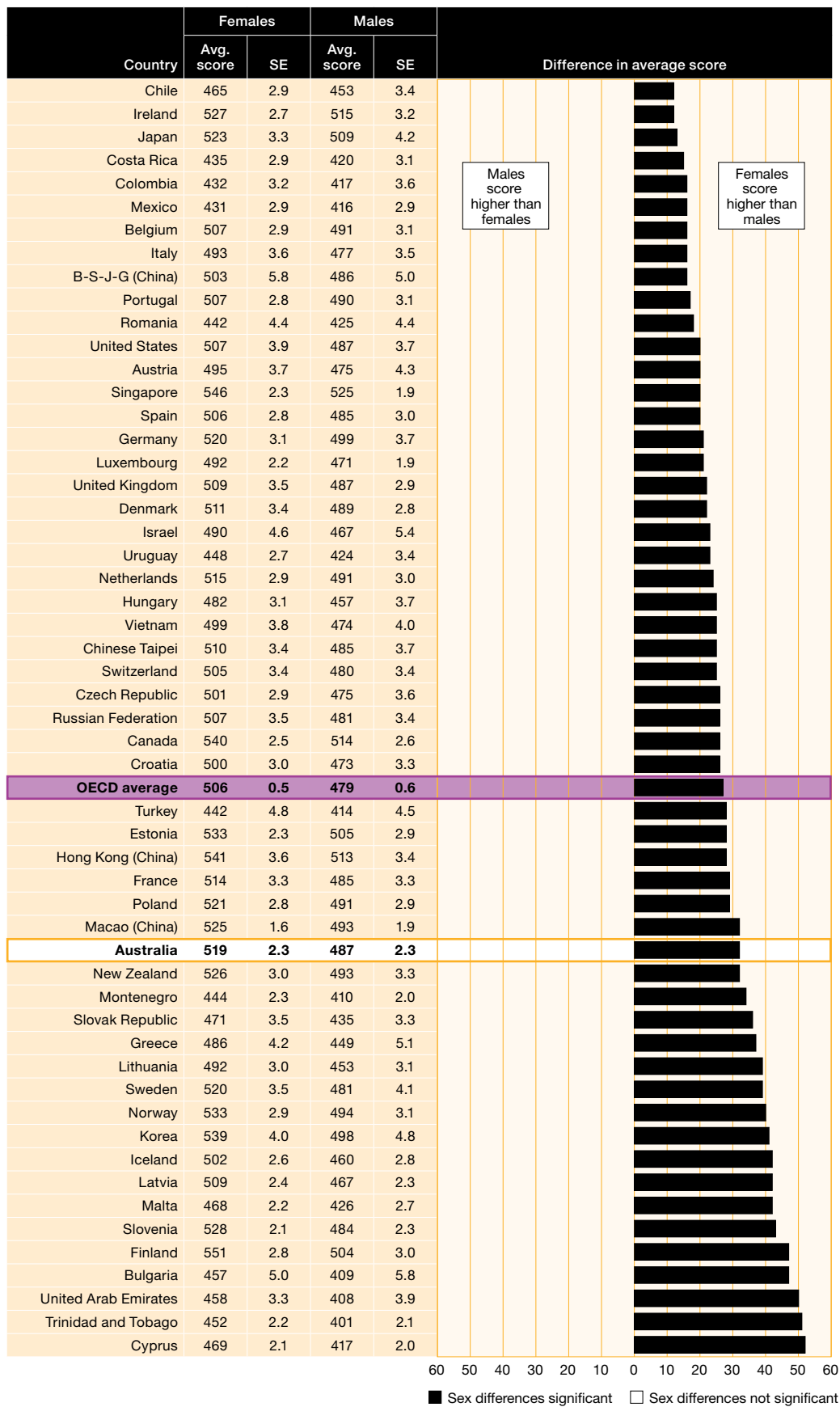


FIGURE 3.2 Average scores and differences in students' performance on the reading literacy scale, by country and sex

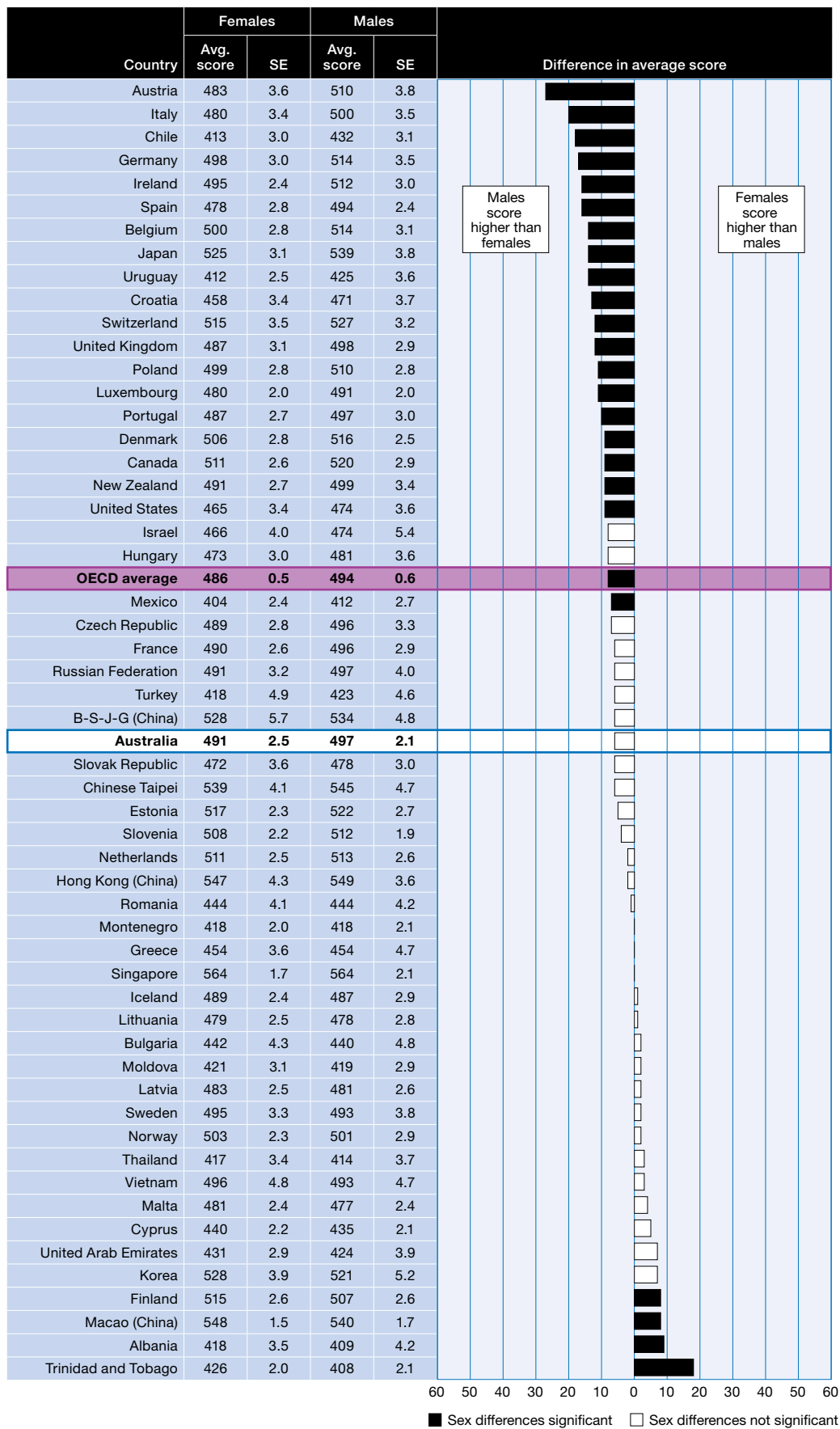


FIGURE 3.3 Average scores and differences in students' performance on the mathematical literacy scale, by country and sex



PISA results in a national context

PART

B

4.1 Scientific literacy

- ▶ Figure 4.1 lists the average scientific literacy scores along with the standard errors, confidence intervals around the average, the difference between the 5th and 95th percentiles, as well as the proportions of low, middle, and high performers on the scientific literacy scale, by jurisdiction. The OECD average, Australia’s average and Singapore’s average have been included for comparison.
- ▶ The average scores for scientific literacy in 2015 ranged from 527 points in the Australian Capital Territory to 483 points in Tasmania. The average score difference between these two jurisdictions was 44 points, which is around half a proficiency level or equivalent to around one-and-a-half years of schooling.
- ▶ The Northern Territory displayed the widest distribution of scores, with a range of 365 points between the 5th and 95th percentiles. Western Australia and South Australia had the narrowest range, with 321 points and 322 points separating the 5th and 95th percentiles.
- ▶ Singapore performed significantly higher, by 29 points on average, than the highest performing jurisdiction, the Australian Capital Territory, and by 73 points on average compared to the lowest performing jurisdiction, Tasmania.
- ▶ The Australian Capital Territory was the jurisdiction with the highest proportion of high performers with a proportion of 14% of students compared to Singapore, which had 24%. New South Wales, Western Australia and the Northern Territory had 12%; Victoria, Queensland and South Australia had 10%. Tasmania had 9% of high performers, which was similar to the OECD average of 8%.
- ▶ Tasmania (27%) and the Northern Territory (26%) had the highest proportions of low-performers. Each jurisdiction was higher than the OECD average of 21% of students. All other jurisdictions had lower proportions of low performers compared to the OECD average, with proportions that ranged from 14% in the Australian Capital Territory to 19% in New South Wales. The proportion of low performers in Singapore (10%) was lower than the proportion of low performers across any of the jurisdictions.

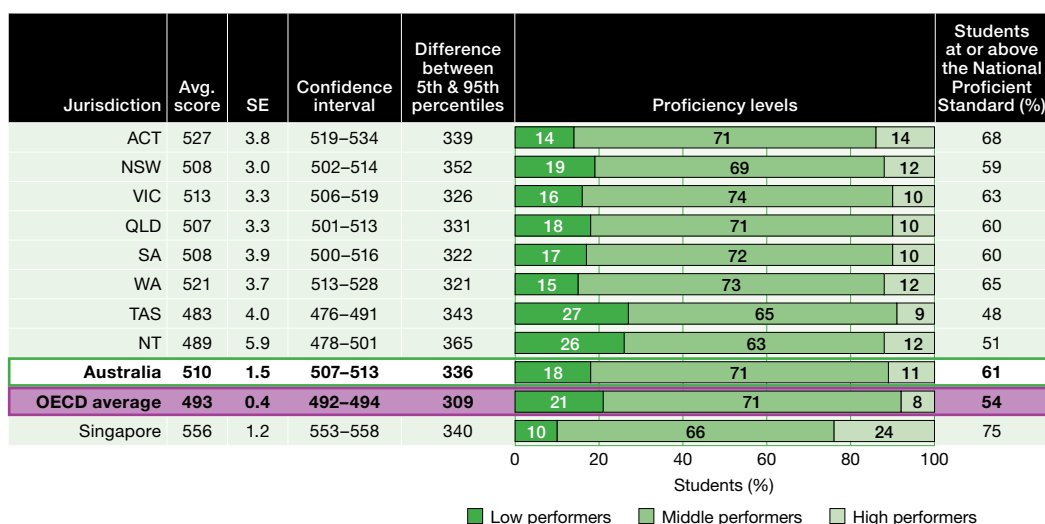


FIGURE 4.1 Average scores and proficiency levels in scientific literacy, by jurisdiction

- ▶ The proportion of students in each jurisdiction who reached the National Proficient Standard in scientific literacy was 48% in Tasmania; 51% in the Northern Territory; 59% in New South Wales; 60% in Queensland and South Australia; 63% in Victoria; 65% in Western Australia; and 68% in the Australian Capital Territory.
- ▶ Table 4.1 shows the average scores and standard errors for each jurisdiction, along with the pairwise comparison of average scientific literacy performance between any two jurisdictions.
- ▶ The Australian Capital Territory and Western Australia performed at a level not significantly different to one another but performed significantly higher than New South Wales, South Australia, Queensland, the Northern Territory and Tasmania. The Australian Capital Territory also performed significantly higher than Victoria, and Western Australia also performed at a statistically similar level to Victoria. Victoria, New South Wales, South Australia and Queensland performed at a level not significantly different to one another. All jurisdictions performed significantly higher than the Northern Territory and Tasmania. The Northern Territory performed at a level that was statistically similar to Tasmania.
- ▶ Six jurisdictions (the Australian Capital Territory, Western Australia, Victoria, New South Wales, South Australia and Queensland) performed at a significantly higher level than the OECD average (493 points). The Northern Territory performed not significantly different to the OECD average and Tasmania performed significantly lower than the OECD average.
- ▶ Appendix A provides information about the scientific literacy performance of each jurisdiction compared to participating countries.

TABLE 4.1 Average scores and multiple comparisons of scientific literacy performance, by jurisdiction

Jurisdiction	Avg. score	SE	ACT	WA	VIC	NSW	SA	QLD	NT	TAS	OECD average
ACT	527	3.8		●	▲	▲	▲	▲	▲	▲	▲
WA	521	3.7	●		●	▲	▲	▲	▲	▲	▲
VIC	513	3.3	▼	●		●	●	●	▲	▲	▲
NSW	508	3.0	▼	▼	●		●	●	▲	▲	▲
SA	508	3.9	▼	▼	●	●		●	▲	▲	▲
QLD	507	3.3	▼	▼	●	●	●		▲	▲	▲
NT	489	5.9	▼	▼	▼	▼	▼	▼		●	●
TAS	483	4.0	▼	▼	▼	▼	▼	▼	●		▼
OECD average	493	0.4	▼	▼	▼	▼	▼	▼	●	▲	

Note: read across the row to compare a jurisdiction's performance with the performance of each jurisdiction listed in the column heading.

- ▲ Average performance statistically significantly higher than in comparison jurisdiction
- No statistically significant difference from comparison jurisdiction
- ▼ Average performance statistically significantly lower than in comparison jurisdiction

4.2 Reading literacy

- ▶ Figure 4.2 shows the average reading literacy scores for students in each of the Australian jurisdictions, as well as the OECD average, Australia's average and Singapore's average. Figure 4.2 also shows the proportions of low, middle and high performers on the reading literacy scale.
- ▶ The average scores for reading literacy in 2015 ranged from 516 points in the Australian Capital Territory to 474 points in the Northern Territory. The average score difference between these two jurisdictions was 42 points, which is around half a proficiency level or equivalent to around one-and-a-half years of schooling.
- ▶ New South Wales had the widest spread of scores, with 357 points between the students at the 5th and 95th percentiles, while Victoria and Western Australia had the narrowest spread of scores with 323 and 324 points.

- ▶ All jurisdictions performed significantly higher than the OECD average, except for Tasmania and the Northern Territory, whose performances were significantly lower than the OECD average.
- ▶ Singapore performed significantly higher, by 19 points on average, than the highest performing jurisdiction, the Australian Capital Territory, and by 61 points on average compared to the lowest performing jurisdiction, the Northern Territory.
- ▶ The Australian Capital Territory was the jurisdiction with the highest proportion of high performers with a proportion of 14% of students compared to Singapore, which had 18%. Western Australia had a proportion of 11%; Victoria, Queensland and South Australia had 10% and Tasmania and the Northern Territory had the lowest proportion of high performers with 7% and 8%, which was similar to the OECD average of 8%.
- ▶ Tasmania and the Northern Territory had the highest proportions of low performers (26% and 28%), which were higher than the OECD average of 20%. New South Wales and Queensland had proportions of 19%; South Australia had 18%, Western Australia had 17% and the Australian Capital Territory and Victoria each had proportions of 16% of low performers. The proportions of low performers for these six jurisdictions were lower than the OECD average.

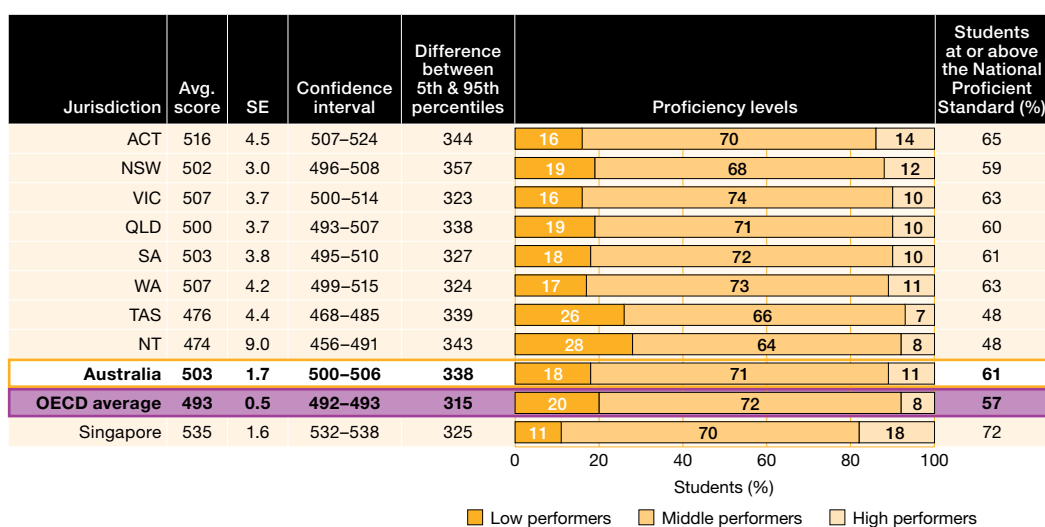


FIGURE 4.2 Average scores and proficiency levels in reading literacy, by jurisdiction

- ▶ The proportion of students in each jurisdiction who reached the National Proficient Standard in reading literacy was 48% in Tasmania and the Northern Territory; 59% in New South Wales; 60% in Queensland; 61% in South Australia; 63% in Victoria and Western Australia; and 65% in the Australian Capital Territory.
- ▶ Table 4.2 shows the average scores and standard errors for each jurisdiction, along with the pairwise comparison of average reading literacy performance between any two jurisdictions.
- ▶ The Australian Capital Territory performed at a level not significantly different to Western Australia and Victoria, and performed significantly higher than South Australia, New South Wales, Queensland, Tasmania and the Northern Territory. Western Australia, Victoria, South Australia, New South Wales and Queensland performed not significantly different to one another, and significantly higher than Tasmania and the Northern Territory. The average scores in reading literacy for Tasmania and the Northern Territory were not significantly different to one another.
- ▶ All jurisdictions performed significantly higher than the OECD average, except for Tasmania and the Northern Territory, whose performance was significantly lower than the OECD average.
- ▶ Appendix B provides information about the reading literacy performance of each jurisdiction compared to participating countries.

TABLE 4.2 Average scores and multiple comparisons of reading literacy performance, by jurisdiction

Jurisdiction	Avg. score	SE	ACT	WA	VIC	SA	NSW	QLD	TAS	NT	OECD average
ACT	516	4.5		●	●	▲	▲	▲	▲	▲	▲
WA	507	4.2	●		●	●	●	●	▲	▲	▲
VIC	507	3.7	●	●		●	●	●	▲	▲	▲
SA	503	3.8	▼	●	●		●	●	▲	▲	▲
NSW	502	3.0	▼	●	●	●		●	▲	▲	▲
QLD	500	3.7	▼	●	●	●	●		▲	▲	▲
TAS	476	4.4	▼	▼	▼	▼	▼	▼		●	▼
NT	474	9.0	▼	▼	▼	▼	▼	▼	●		▼
OECD average	493	0.5	▼	▼	▼	▼	▼	▼	▲	▲	

Note: read across the row to compare a jurisdiction's performance with the performance of each jurisdiction listed in the column heading.

▲ Average performance statistically significantly higher than in comparison jurisdiction

● No statistically significant difference from comparison jurisdiction

▼ Average performance statistically significantly lower than in comparison jurisdiction

4.3 Mathematical literacy

- ▶ Figure 4.3 shows the average mathematical literacy scores along with the standard errors, confidence intervals around the average, the difference between the 5th and 95th percentiles, as well as the proportions of low, middle, and high performers on the mathematical literacy scale, by jurisdiction. The OECD average, Australia's average and Singapore's average have been included for comparison.
- ▶ The average scores for mathematical literacy in 2015 ranged from 505 points in the Australian Capital Territory to 469 points in Tasmania. The average score difference between these two jurisdictions was 36 points, which is around half a proficiency level or equivalent to more than one year of schooling.
- ▶ The Northern Territory displayed the widest spread of responses, with a range of 332 points between the 5th and 95th percentiles. Victoria and South Australia had the narrowest spread, with 292 points and 293 points separating the 5th and 95th percentiles.
- ▶ Singapore performed significantly higher, by 59 points on average, than the highest performing jurisdiction, the Australian Capital Territory, and 95 points higher on average compared to the lowest performing jurisdiction, Tasmania.
- ▶ The Australian Capital Territory was the jurisdiction with the highest proportion of high performers with a proportion of 14%, compared to Singapore, which had 35%. New South Wales had a proportion of 13% and Western Australia had 12%. These proportions were higher than the OECD average of 11%. Victoria and the Northern Territory each had proportions of 11% of high performers; Queensland and Tasmania had 9% and 8%, which were lower than the OECD average.
- ▶ Tasmania (32%), the Northern Territory (28%) and Queensland (24%) had the highest proportions of low performers. These proportions were higher than the proportion of low performers across the OECD (23%). New South Wales and South Australia had 23% of low performers, which was the same as the OECD average. The Australian Capital Territory and Victoria each had 19%, and Western Australia had 18%, which were all lower than the OECD average.
- ▶ The proportion of students in each jurisdiction who reached the National Proficient Standard in mathematical literacy was 44% in Tasmania; 47% in the Northern Territory; 53% in Queensland; 54% in South Australia; 55% in New South Wales; 58% in Victoria; 60% in Western Australia; and 61% in the Australian Capital Territory.

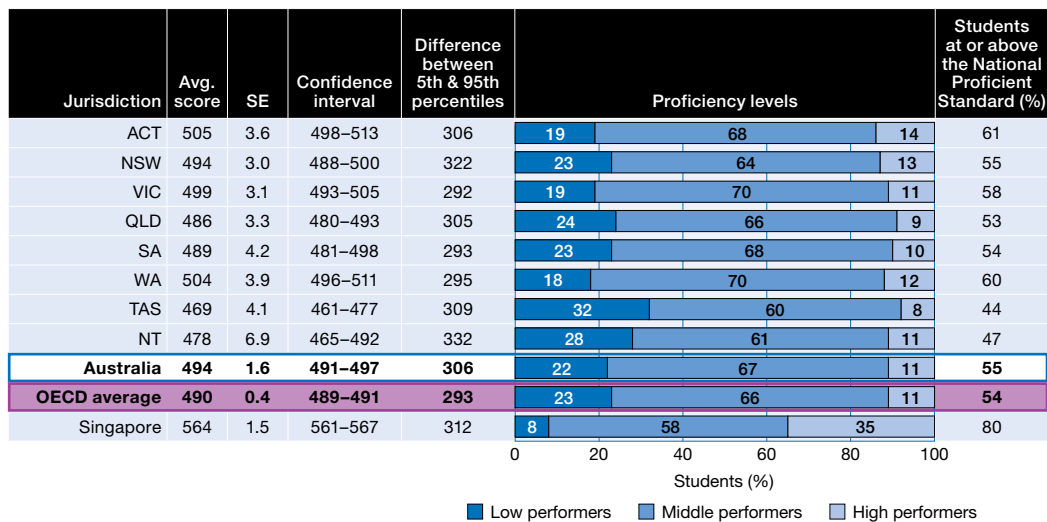


FIGURE 4.3 Average scores and proficiency levels in mathematical literacy, by jurisdiction

- ▶ Table 4.3 shows the mathematical pairwise comparison of average performance between any two jurisdictions.
- ▶ The Australian Capital Territory, Western Australia and Victoria performed at a statistically similar level; however, the Australian Capital Territory outperformed all other jurisdictions. Western Australia also performed at a level not significantly different to New South Wales and outperformed South Australia, Queensland, the Northern Territory and Tasmania. Victoria performed at a level not significantly different to New South Wales and South Australia and performed significantly higher than Queensland, the Northern Territory and Tasmania. New South Wales performed significantly higher than the Northern Territory and Tasmania, while South Australia and Queensland performed at a level statistically similar to the Northern Territory and significantly higher than Tasmania. The Northern Territory performed not significantly different to Tasmania.
- ▶ Three jurisdictions (the Australian Capital Territory, Western Australia and Victoria) performed at a significantly higher level than the OECD average (490 points). Four jurisdictions (New South Wales, South Australia, Queensland and the Northern Territory) performed not significantly different to the OECD average. Tasmania performed significantly lower than the OECD average.
- ▶ Appendix C provides information about the mathematical literacy performance of each jurisdiction compared to participating countries.

TABLE 4.3 Average scores and multiple comparisons of mathematical literacy performance, by jurisdiction

Jurisdiction	Avg. score	SE	ACT	WA	VIC	NSW	SA	QLD	NT	TAS	OECD average
ACT	505	3.6		●	●	▲	▲	▲	▲	▲	▲
WA	504	3.9	●		●	●	▲	▲	▲	▲	▲
VIC	499	3.1	●	●		●	●	▲	▲	▲	▲
NSW	494	3.0	▼	●	●		●	●	▲	▲	●
SA	489	4.2	▼	▼	●	●		●	●	▲	●
QLD	486	3.3	▼	▼	▼	●	●		●	▲	●
NT	478	6.9	▼	▼	▼	▼	●	●		●	●
TAS	469	4.1	▼	▼	▼	▼	▼	▼	●		▼
OECD average	490	0.4	▼	▼	▼	●	●	●	●	▲	

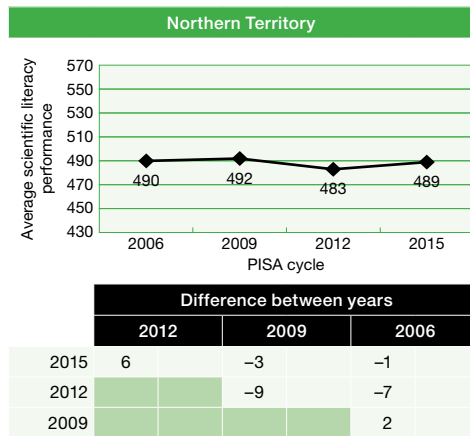
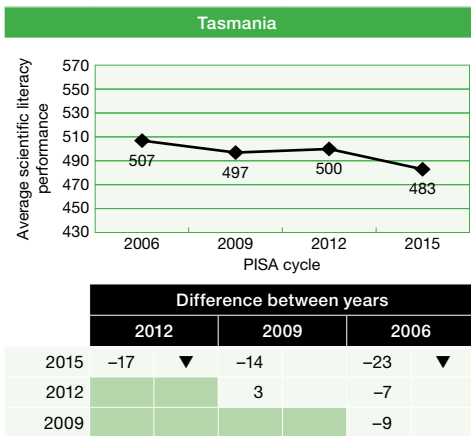
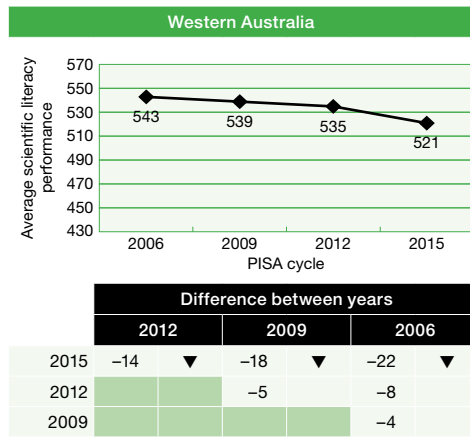
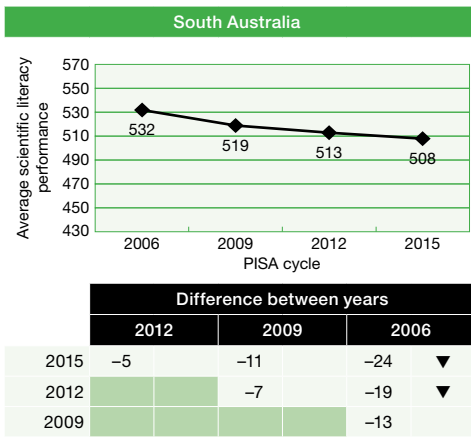
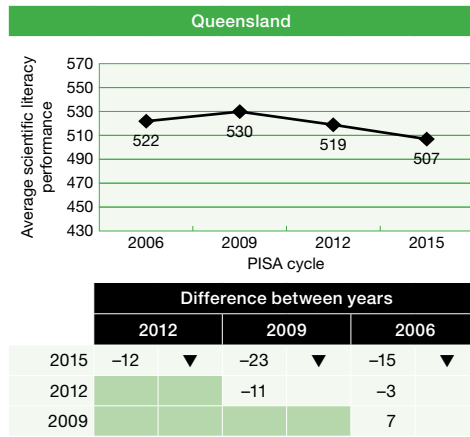
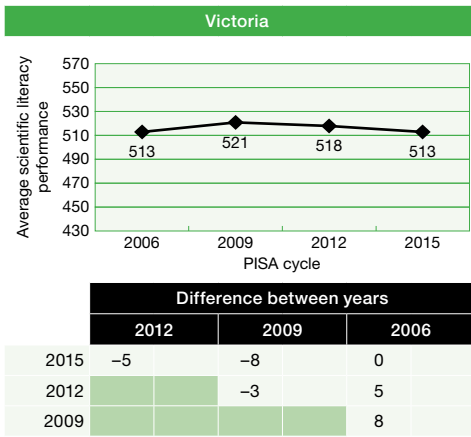
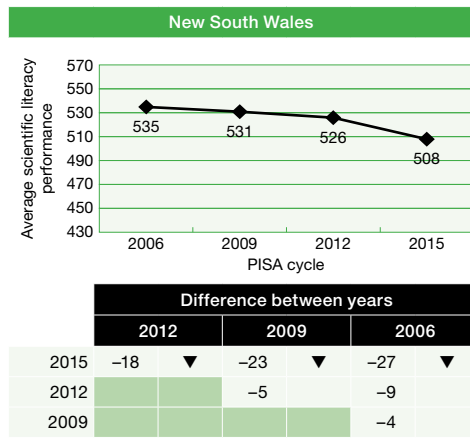
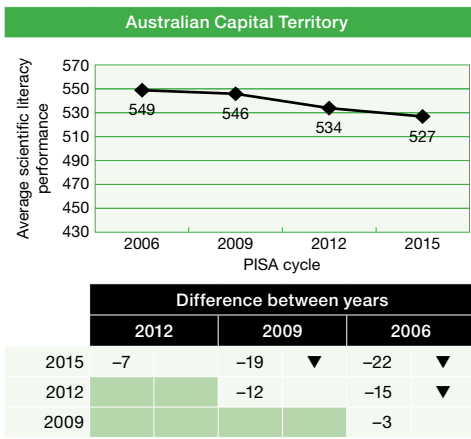
Note: read across the row to compare a jurisdiction's performance with the performance of each jurisdiction listed in the column heading.

- ▲ Average performance statistically significantly higher than in comparison jurisdiction
- No statistically significant difference from comparison jurisdiction
- ▼ Average performance statistically significantly lower than in comparison jurisdiction

5.1 Scientific literacy

- ▶ The average scientific literacy scores between PISA 2006 and 2015, when scientific literacy was the major domain, show that performances were not significantly different in Victoria and the Northern Territory. However, the other jurisdictions experienced a significant decline in scientific literacy performance. Queensland had the smallest decline (15 points), followed by the Australian Capital Territory and Western Australia (22 points each), Tasmania (23 points), South Australia (24 points) and New South Wales with the largest decline (27 points) between 2006 and 2015.
- ▶ Figure 5.1 shows the average performance in scientific literacy for each cycle since PISA 2006 by jurisdiction. In addition, it also shows the change in performance between the two cycles and indicates whether this change in performance is significant or not significant.
- ▶ Comparing scientific literacy performance between one PISA cycle and the adjacent cycle, a period of 3 years, indicates that the changes in performance between 2006 and 2009, and between 2009 and 2012 in each jurisdiction were not significant. However, the decreases in scores between 2012 and 2015 were significantly different in four jurisdictions (Queensland, 12 points; Western Australia, 14 points; Tasmania, 17 points; New South Wales, 18 points).

- ▶ Figure 5.2 shows the proportions of low and high performers on the scientific literacy proficiency scale, by jurisdiction, for PISA 2006, 2009, 2012 and 2015.
- ▶ In 2015, for every jurisdiction, there was a lower proportion of high performers than in 2006. Victoria and the Northern Territory showed a 1% decline in their proportions of high performers between 2006 and 2015; Queensland and Tasmania showed a 2% difference; New South Wales showed 4%; South Australia showed 5%; and the Australian Capital Territory and Western Australia each showed 7%.
- ▶ Between PISA 2006 and 2015, the proportions of low performers remained constant in Victoria and the Northern Territory. However, the proportions increased in the other jurisdictions: the Australian Capital Territory had a 4% increase; Queensland and Western Australia each had 5%; South Australia had 7% and New South Wales and Tasmania each had an 8% increase.



Note: read across the row to determine whether the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

FIGURE 5.1 Average scientific literacy performances and differences from PISA 2006 to 2015, by jurisdiction

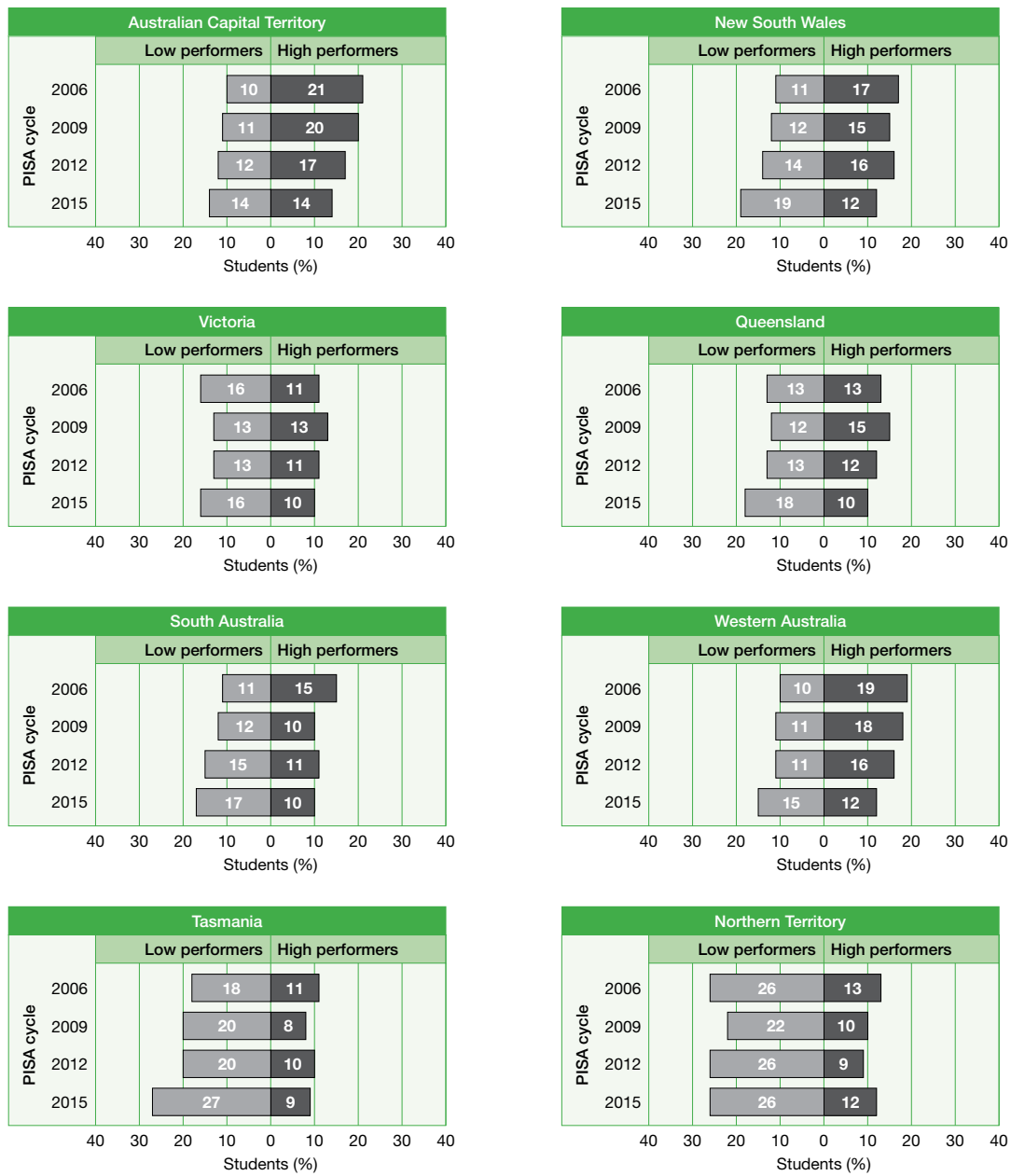
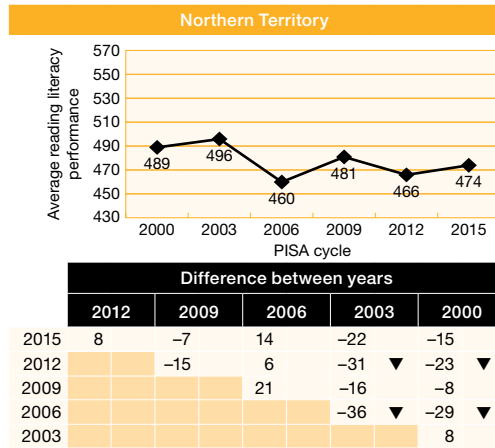
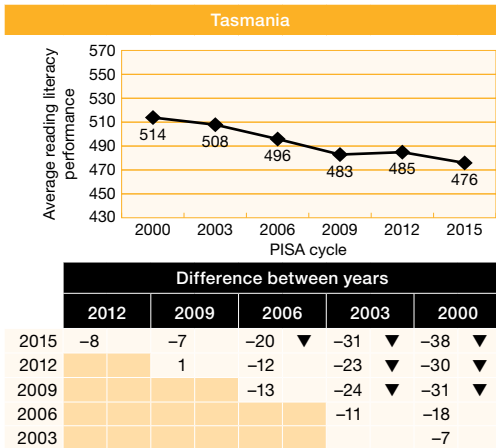
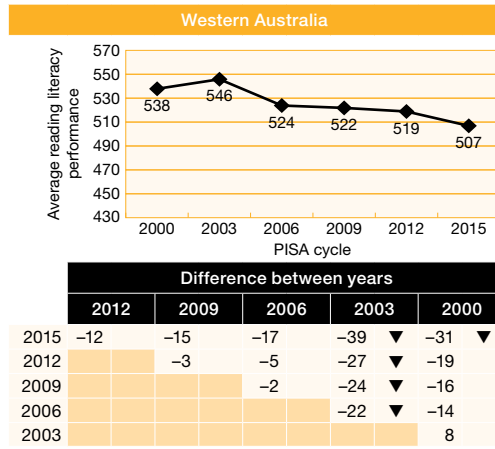
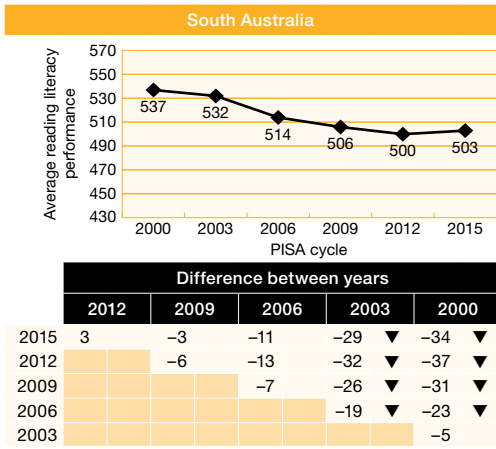
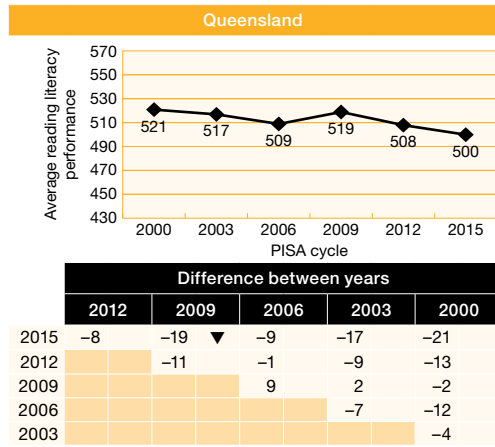
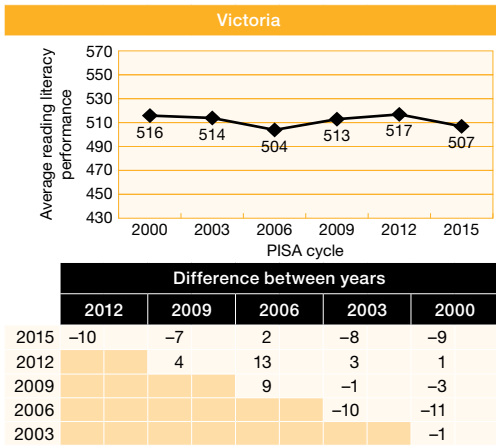
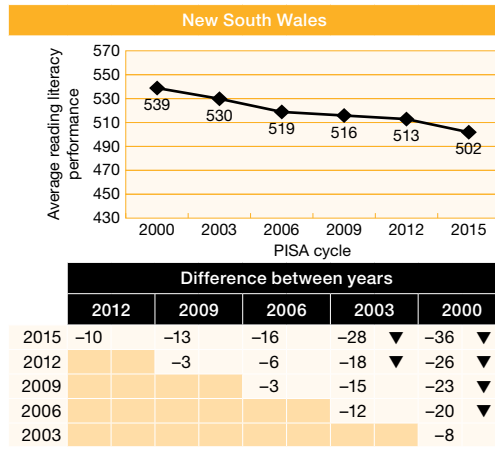
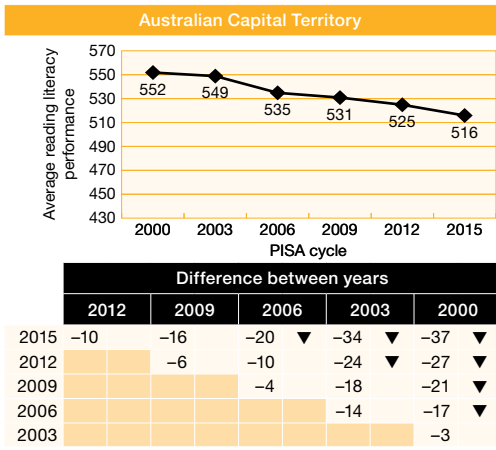


FIGURE 5.2 Percentage of low and high performers on the scientific literacy proficiency scale over time

5.2 Reading literacy

- ▶ The average reading literacy scores between PISA 2000 and 2015 show that performance was not significantly different in Victoria, Queensland and the Northern Territory. However, the other jurisdictions experienced a significant decline in reading literacy performance. Western Australia had the smallest decline (31 points), followed by South Australia (34 points), New South Wales (36 points), the Australian Capital Territory (37 points). Tasmania had the largest decline (38 points).
- ▶ Figure 5.3 shows the average performance in reading literacy for each PISA cycle since 2000, by jurisdiction. In addition, it also shows the change in performance between the two cycles and indicates whether this change in performance is significant or not significant.
- ▶ The changes in reading literacy performance between 2000 and 2009 show that four jurisdictions experienced a significant decline in performance (the Australian Capital Territory, New South Wales, South Australia, and Tasmania). Performances in the other jurisdictions (Victoria, Queensland, Western Australia and the Northern Territory), were not significant between 2000 and 2009. Between 2009 and 2015, Queensland was the only jurisdiction to show a significant decline in performance (by 19 points). In 2015, the performances of all other jurisdictions were not significantly different to their performances in 2009.

- ▶ Figure 5.4 shows the proportion of low and high performers on the reading literacy proficiency scale, by jurisdiction, for PISA 2000 to 2015.
- ▶ In the 15-year period from 2000 to 2015, there has been an increase in the proportion of low performers and a decline in the proportion of high performers across all jurisdictions.
- ▶ Between 2000 and 2015, the increase in the proportion of low performers in New South Wales and Tasmania was 9%. The increases in the other jurisdictions were 8% in the Australian Capital Territory, 7% in South Australia, 6% in the Northern Territory, 5% in each of Queensland and Western Australia and 2% in Victoria.
- ▶ Between 2000 and 2015, the decrease in the proportion of high performers in the Northern Territory was 2%. The decreases in the other jurisdictions were 4% in Victoria, 5% in Queensland, 6% in New South Wales, 8% in each of South Australia and Tasmania and 11% in each of the Australian Capital Territory and Western Australia.
- ▶ Between 2000 and 2009, the proportions of low performers remained constant in Victoria and in Queensland. However, the proportions increased in the other jurisdictions: Western Australia had a 1% increase; the Northern Territory had 2%, New South Wales had 4%, the Australian Capital Territory and South Australia each had 5% and Tasmania had a 6% increase in the proportion of low performers.



Note: read across the row to determine whether the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

FIGURE 5.3 Average reading literacy performances and differences from PISA 2000 to 2015, by jurisdiction

- ▶ Between 2000 and 2009, the proportions of high performers declined across all jurisdictions. The Northern Territory declined by 1%; Victoria and Queensland by 2%; New South Wales by 5%; the Australian Capital Territory by 6%; Western Australia by 7%; Tasmania by 8%; and South Australia by 9%.
- ▶ Between 2009 and 2015, the proportions of low performers increased across all jurisdictions. Victoria's proportion increased by 1%; the Australian Capital Territory, South Australia and Tasmania each increased by 3%, Western Australia and the Northern Territory each increased by 4% and New South Wales and Queensland each increased by 5%.
- ▶ Between 2009 and 2015, the proportion of high performers remained constant in Tasmania and there was a 1% increase in South Australia. There was a decline in the proportions of high performers in the other six jurisdictions: New South Wales, Victoria and the Northern Territory all declined by 1%, and the Australian Capital Territory, Queensland and Western Australia all declined by 4%.

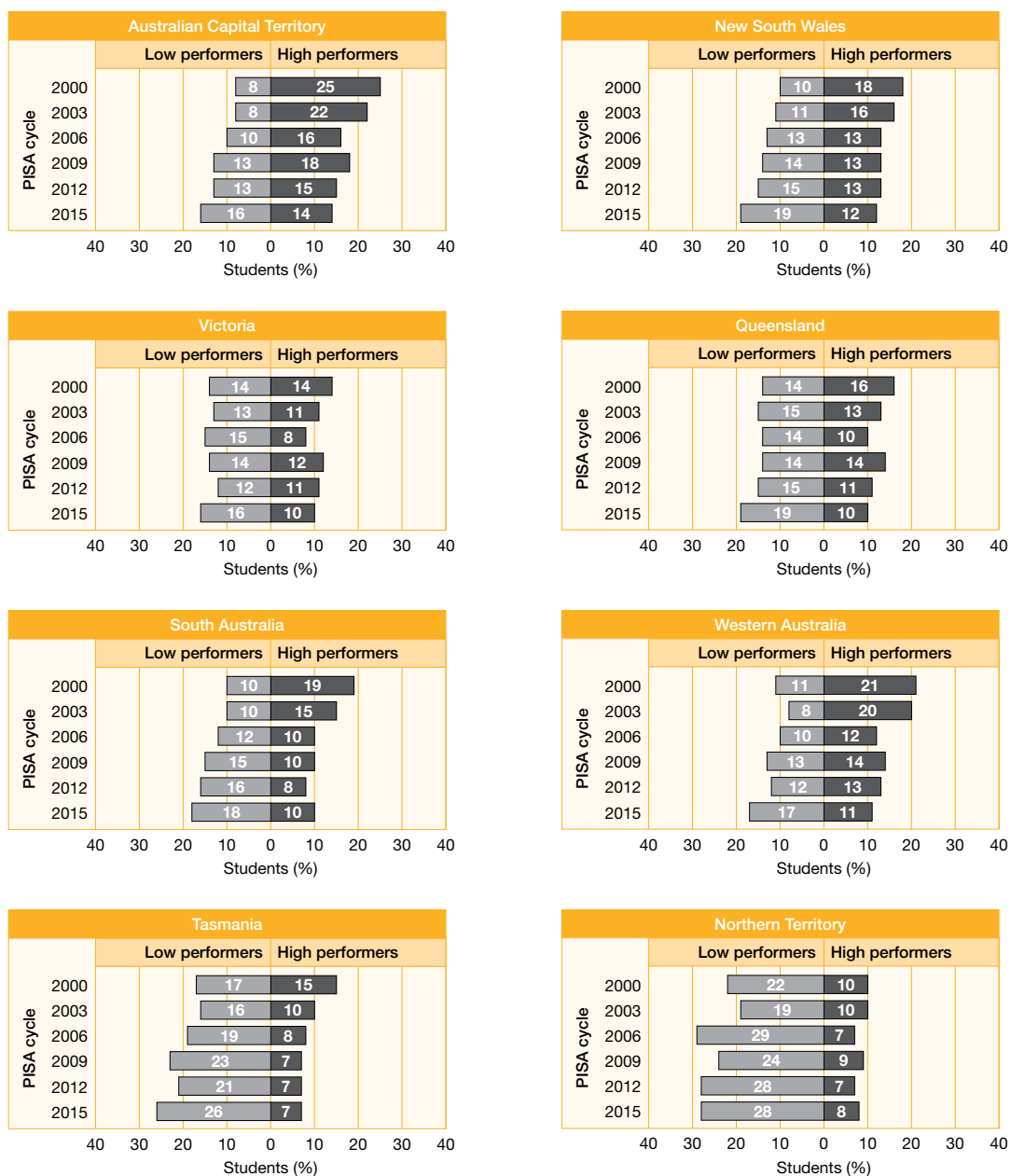
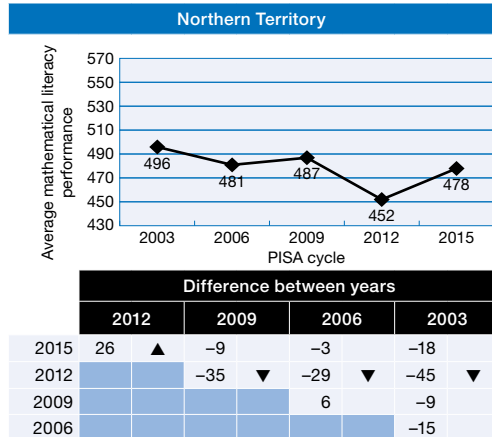
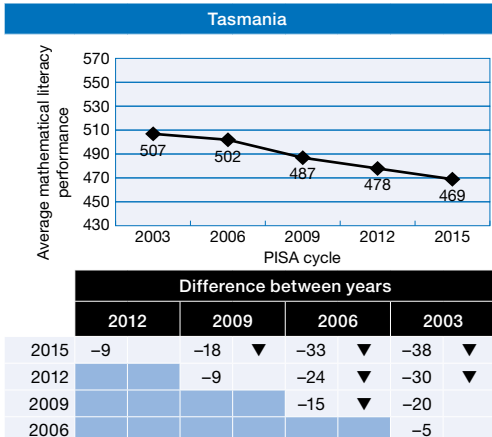
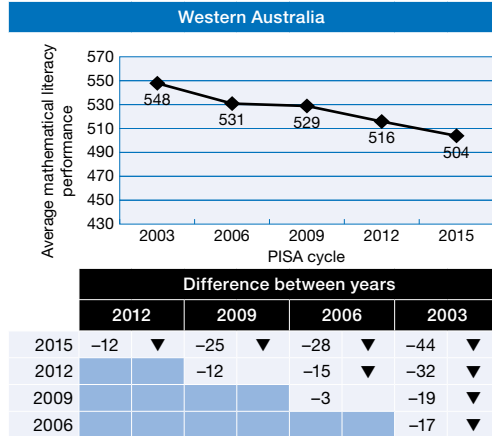
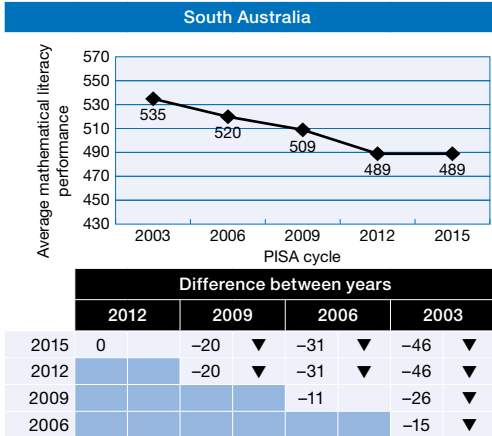
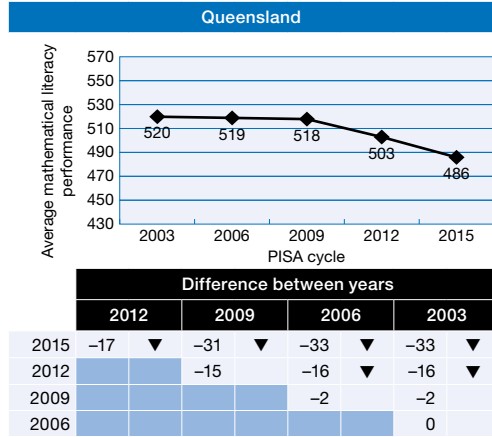
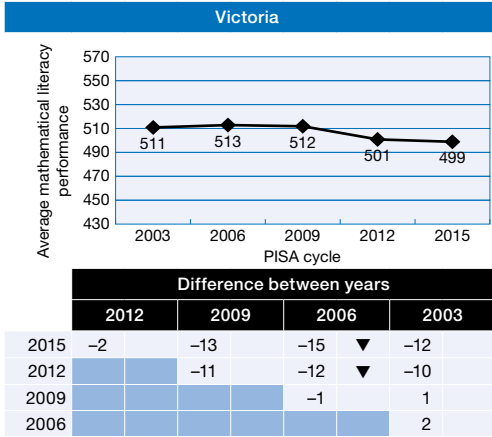
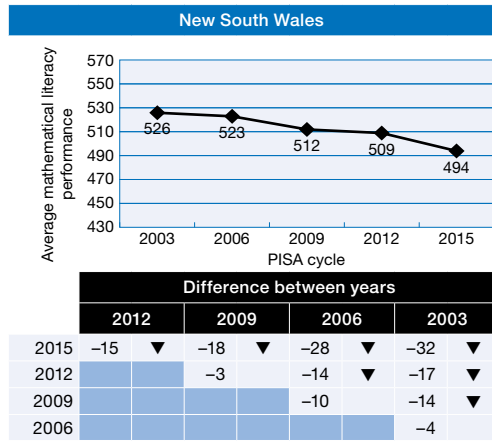
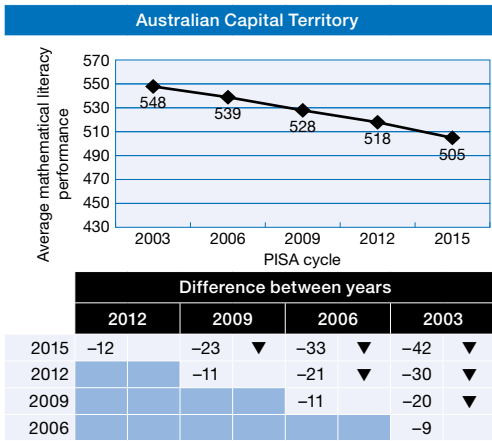


FIGURE 5.4 Percentage of low and high performers on the reading literacy proficiency scale over time

5.3 Mathematical literacy

- ▶ In seven jurisdictions, the average mathematical literacy scores between PISA 2003 and 2012 declined significantly. Queensland had the smallest decline (16 points), followed by New South Wales (17 points), the Australian Capital Territory and Tasmania (each 30 points), Western Australia (32 points), Northern Territory (45 points) and South Australia with the largest decline (46 points). The change in performance for Victoria was not significant.
- ▶ Figure 5.5 shows the average mathematical literacy performance for PISA 2003 to 2015, by jurisdiction. It also shows the change in performance between the two cycles and indicates whether this change in performance is significant or not significant.
- ▶ The changes in mathematical literacy performance between 2012 and 2015 show that Western Australia, New South Wales, and Queensland each experienced significant declines in performance (by 12 points, 15 points and 17 points), while mathematical literacy performance in the Northern Territory significantly improved (by 26 points). The mathematical literacy performances in the Australian Capital Territory, Victoria, South Australia and Tasmania did not change significantly.
- ▶ Figure 5.6 shows the proportions of low and high performers on the mathematical literacy proficiency scale, by jurisdiction, for PISA 2003 to 2015.
- ▶ Across all jurisdictions, the proportions of low performers increased between 2003 and 2012. The largest increases were in the Northern Territory (14%) and South Australia (12%). Tasmania's proportion of low performers increased by 9%, Western Australia's by 8%, New South Wales' by 6%, the Australian Capital Territory's by 5%, Queensland's by 3% and Victoria's by 2%.
- ▶ Between 2003 and 2012, the proportions of high performers in all jurisdictions declined. The largest declines were in South Australia (13%) and Western Australia (10%) followed by 9% in the Australian Capital Territory, 8% in the Northern Territory, 5% in Tasmania, 4% in Queensland and 3% each in Victoria and New South Wales.
- ▶ Between 2012 and 2015, there were changes in the proportions of low performers for all jurisdictions except in Victoria. In South Australia, the proportion of low performers was lower in 2015 than in 2012 (by 1%) and in the Northern Territory it was lower by 8%. However, five jurisdictions experienced increases in the proportions of low performers: Western Australia increased by 2%, the Australian Capital Territory by 3%, New South Wales by 4%, Queensland and Tasmania by 5% each.
- ▶ In all jurisdictions except the Northern Territory, there were decreases in the proportions of high performers between 2012 and 2015. In Victoria, South Australia and Tasmania, the proportions of high performers decreased by 1%. Each of the Australian Capital Territory, New South Wales, Queensland, and Western Australia experienced a 5% decrease in the proportion of high performers.



Note: read across the row to determine whether the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

FIGURE 5.5 Average mathematical literacy performances and differences from PISA 2003 to 2015, by jurisdiction

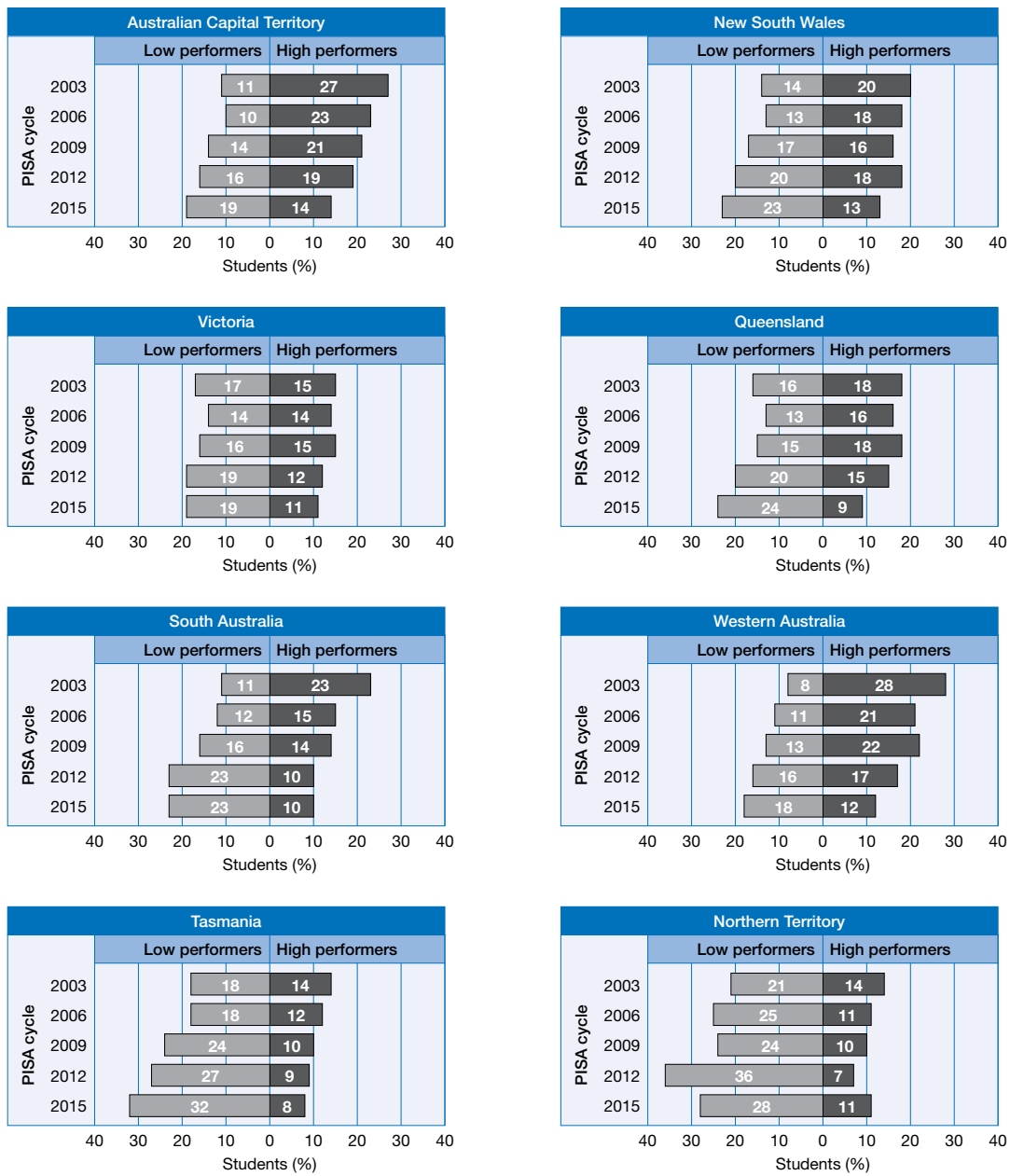


FIGURE 5.6 Percentage of low and high performers on the mathematical literacy proficiency scale over time

The sample design was stratified by school sector to ensure that the Australian PISA 2015 student sample would be representative of the Australian 15-year-old student population across all school sectors.

For the reporting of results by school sector, it is misleading to provide results only using unadjusted average scores because there are higher proportions of students from lower socioeconomic backgrounds who attend government schools compared to the proportions who attend Catholic or independent schools. To ensure fair comparisons, results are adjusted for differences in an individual student's family background or socioeconomic background, as well as the school-level socioeconomic background.

- ▶ Results of student performance across the three school sectors (government, Catholic and independent) are compared using the unadjusted average score. They show that, on average, students in the independent school sector performed significantly higher than students in the Catholic or government school sectors, and that students in the Catholic school sector performed significantly higher than students in the government school sector.
- ▶ The average score differences between students in government schools and students in Catholic schools, and between students in Catholic schools and students in independent schools were approximately 30 points or equivalent to around one year of schooling. The average score difference between students in government schools and students in independent schools was even larger at around 60 points or equivalent to around two years of schooling.
- ▶ Government schools had a higher proportion of low performers than Catholic or independent schools, and Catholic schools had a higher proportion of low performers than independent schools. Similarly, government schools had a lower proportion of high performers than Catholic or independent schools, and Catholic schools had a lower proportion of high performers than independent schools.
- ▶ Figure 6.1 shows the average performance (unadjusted for student and school socioeconomic background) and the proportions of students across the proficiency scales in scientific, reading and mathematical literacy, by school sector.

6.1 Scientific literacy

- ▶ Students in government schools achieved an average score of 492 points in scientific literacy, while students in Catholic and independent schools achieved an average score of 521 points and 552 points.
- ▶ The proportion of low performers in government schools (23%) was higher than for Catholic (13%) and independent schools (7%).
- ▶ The proportions of high performers in government schools and Catholic schools were similar (9% and 11%), while there was nearly twice the amount of high performers in independent schools (18%).
- ▶ Around half the students in government schools (53%) reached the National Proficient Standard compared to two-thirds of students in Catholic schools (66%) and approximately three-quarters of students in independent schools (78%).

6.2 Reading literacy

- ▶ Students in government schools achieved an average score of 484 points in reading literacy, while students in Catholic and independent schools achieved average scores of 517 points and 544 points.
- ▶ The proportion of low performers in government schools was higher (24%) than for Catholic (13%) or independent schools (7%).
- ▶ The proportion of high performers in government schools was 8% and in Catholic schools was 12%, which were both lower than the proportion of high performers in independent schools (18%).
- ▶ Approximately half the students in government schools (53%) reached the National Proficient Standard compared to two-thirds of students in Catholic schools (67%) and approximately three-quarters of students in independent schools (77%).

6.3 Mathematical literacy

- ▶ Students in government schools achieved an average score of 477 points in mathematical literacy, while students in Catholic schools scored an average of 503 points and students in independent schools achieved an average of 532 points.
- ▶ The proportion of low performers in government schools was higher (28%) than for Catholic (17%) or independent schools (10%).
- ▶ The proportion of high performers in government schools was 9% and in Catholic schools was 12%, which were both lower than the proportion of high performers in independent schools (19%).
- ▶ Approximately half the students in government schools (48%) reached the National Proficient Standard compared to almost two-thirds of students in Catholic schools (60%) and approximately three-quarters of students in independent schools (73%).

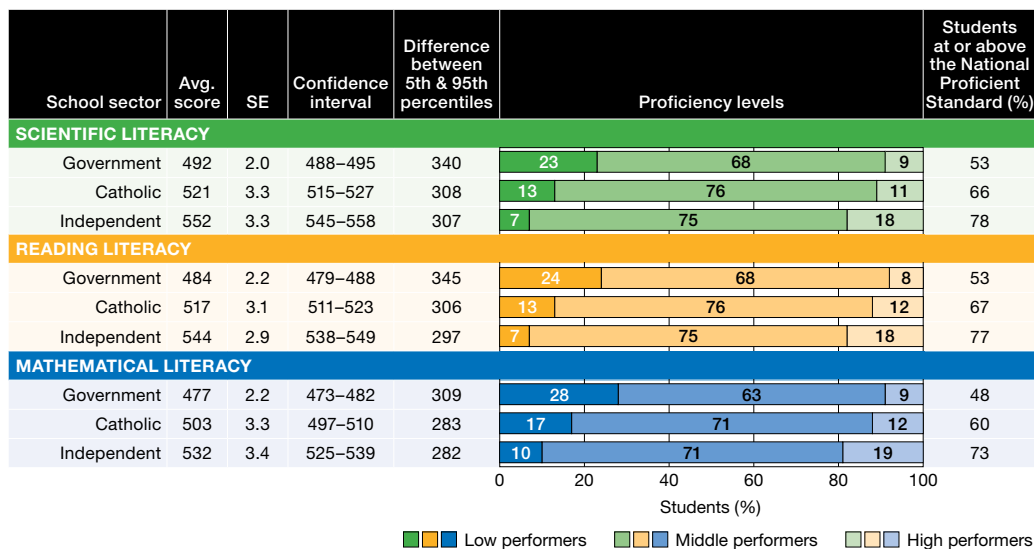


FIGURE 6.1 Average scores and proficiency levels in scientific, reading and mathematical literacy, by school sector (unadjusted for student- and school-level socioeconomic background)

6.4 Results for school sectors adjusting for student and school socioeconomic background

- ▶ Table 6.1 shows the average difference in the unadjusted score as well as the average score differences in scientific, reading and mathematical literacy performance when first student socioeconomic background, and then second both student- and school-level socioeconomic background are accounted for.
- ▶ When student-level socioeconomic background is taken into account, students in independent schools performed significantly higher than students in Catholic schools, and students in Catholic schools performed significantly higher than students in government schools, although these differences are reduced.
- ▶ When school-level socioeconomic background is also taken into account, the differences between students in government schools and students in Catholic schools, and the differences between students in government schools and students in independent schools were not significant. However, the differences between students in Catholic schools and students in independent schools remain significant. Students in independent schools bring with them an advantage over students in Catholic schools that is not attributed to student and school socioeconomic background. This result has not been seen in PISA 2009 or 2012, where no significant differences in performance between school sectors were found once student- and school-level socioeconomic background were taken into account.

TABLE 6.1 Differences in average scientific, reading and mathematical literacy scores after adjustment for student- and school-level socioeconomic background

School sector comparison	Difference in raw score (score points)	Difference in scores after student socioeconomic background is accounted for	Difference in scores after student and school level socioeconomic background is accounted for
SCIENTIFIC LITERACY			
Catholic–government	30	13	–6
Independent–government	60	35	7
Independent–Catholic	31	23	15
READING LITERACY			
Catholic–government	33	17	–1
Independent–government	60	36	8
Independent–Catholic	27	20	12
MATHEMATICAL LITERACY			
Catholic–government	26	11	–7
Independent–government	55	31	5
Independent–Catholic	28	21	13

Note: statistically significant values are shown in bold.

- ▶ Figure 7.1 shows the average performance in scientific, reading and mathematical literacy across the PISA cycles, by school sector.
- ▶ Between 2009 and 2015, the average scientific literacy performance for each of the school sectors decreased significantly. In 2009, the average scientific literacy performance in government schools was 511 points, which in 2015 had declined by 19 points to 492 points. The change in performance for Catholic schools between 2009 and 2015 also showed a 19-point decline, from an average of 540 points in 2009 to 521 points in 2015. There was also a decline in performance for independent schools, from an average of 566 points in 2009 to 552 points in 2015, a decline of 14 points.
- ▶ The average reading literacy performance for students in government and Catholic schools declined significantly between 2009 and 2015 (by 13 points and 16 points), while the performance for students in independent schools has not changed significantly.
- ▶ The average mathematical literacy performance between 2009 and 2015 for each of the school sectors declined significantly between 2009 and 2015. There was a 22-point decline for students in government schools, a 23-point decline for students in Catholic schools, and a 17-point decline for independent schools over this six-year period.

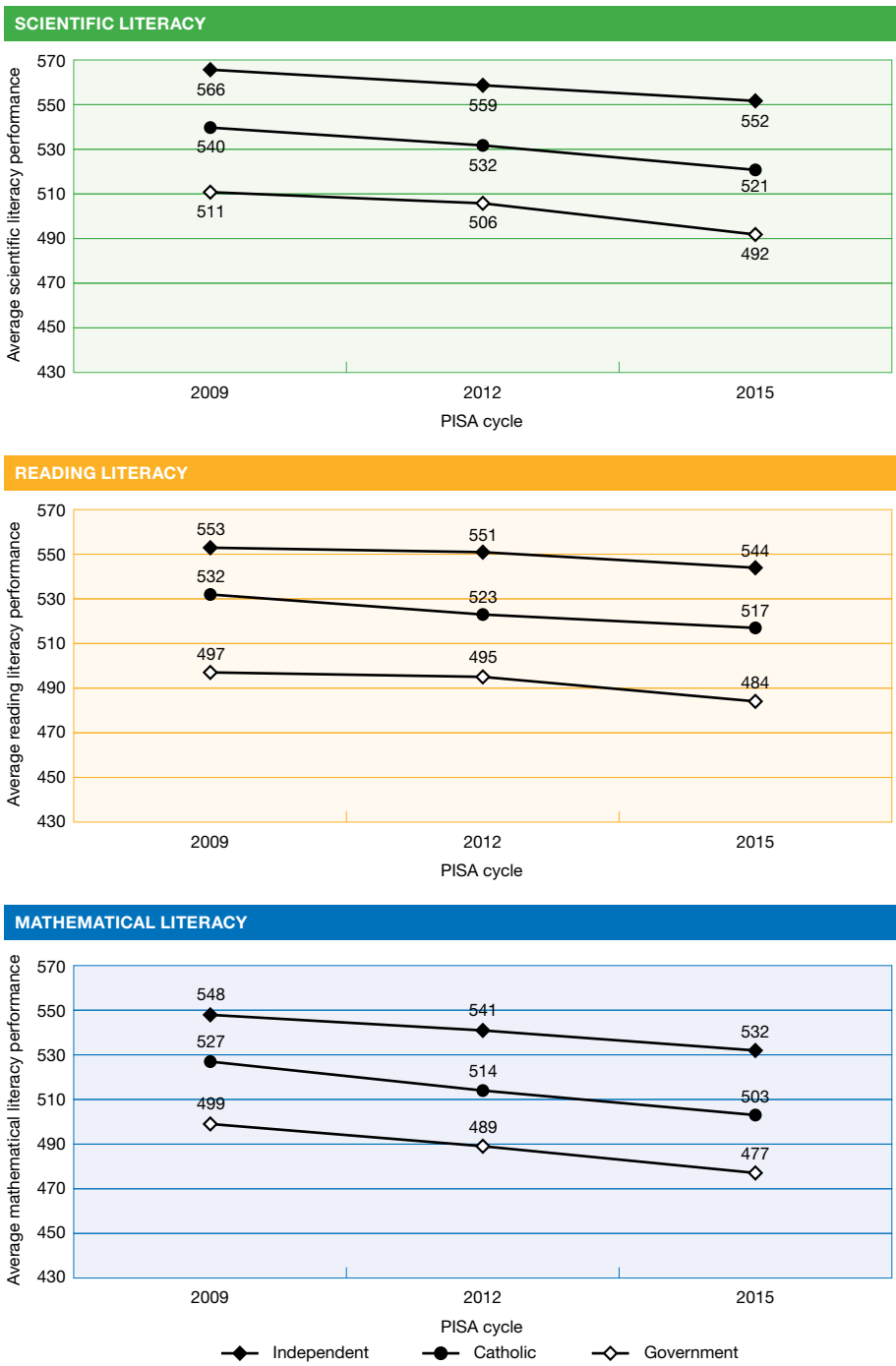


FIGURE 7.1 Average students' performance for scientific, reading and mathematical literacy over time, by school sector (unadjusted for student- and school-level socioeconomic background)



**PISA results
across Australian
demographic groups**

PART



8.1 Performance of the Australian jurisdictions by sex in PISA 2015

Scientific literacy

Figure 8.1 shows that males performed significantly higher than females in one jurisdiction, the Northern Territory. Males achieved an average score of 499 points, which was 20 points higher than females. This average score difference was equivalent to two-thirds of a year of schooling.

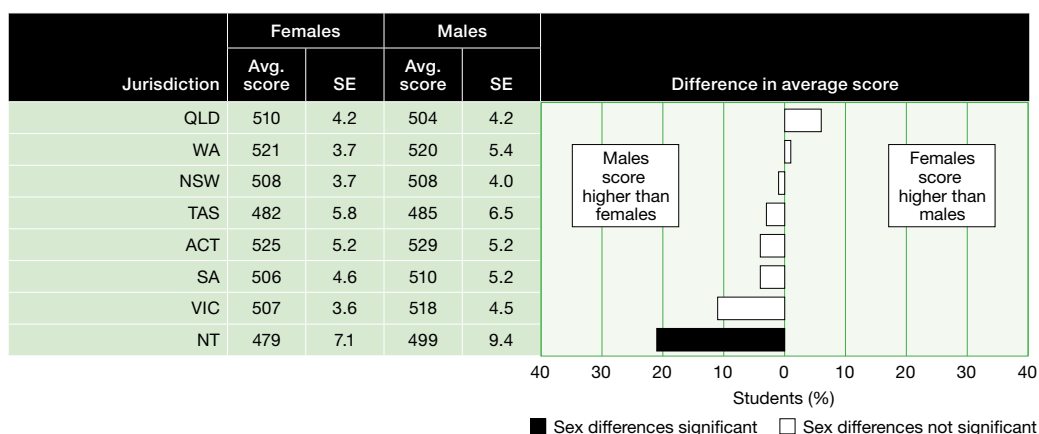


FIGURE 8.1 Average scores and differences in students' performance on the scientific literacy scale, by jurisdiction and sex

Reading literacy

Figure 8.2 shows that females in all jurisdictions except the Northern Territory performed significantly higher than males. Queensland had the largest difference by sex with 39 points, which represents more than half a proficiency level or around one-and-a-third years of schooling. New South Wales had the next largest spread with 35 points, followed by Western Australia with 34 points and South Australia with 30 points. The three jurisdictions with the smallest differences in performance by sex were Tasmania with 26 points, the Australian Capital Territory with 24 points, and Victoria with 23 points. These differences were equivalent to almost one year of schooling.

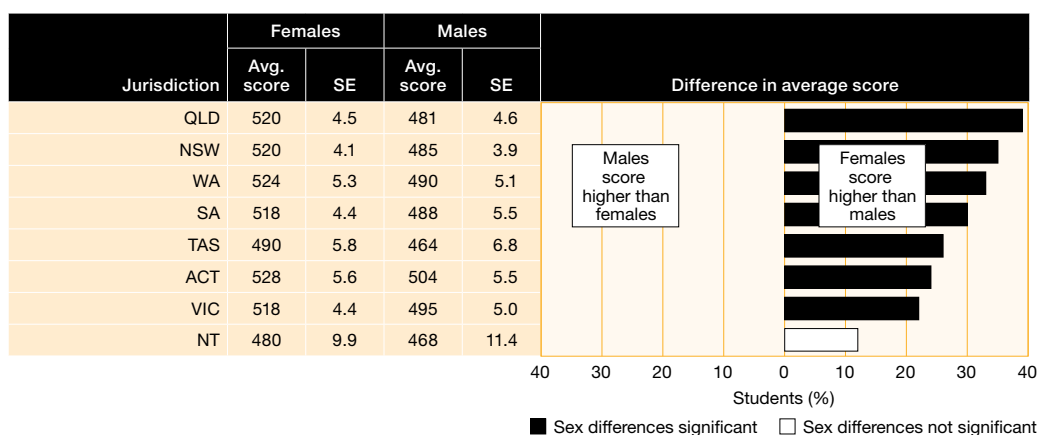


FIGURE 8.2 Average scores and differences in students' performance on the reading literacy scale, by jurisdiction and sex

Mathematical literacy

Figure 8.3 shows that males performed significantly higher than females in two jurisdictions: Victoria and the Northern Territory. In Victoria, there were 13 points separating males from females, which equates to around half a year of schooling, while the gap in performance between males and females in the Northern Territory was larger (28 points), which represents around one year of schooling.

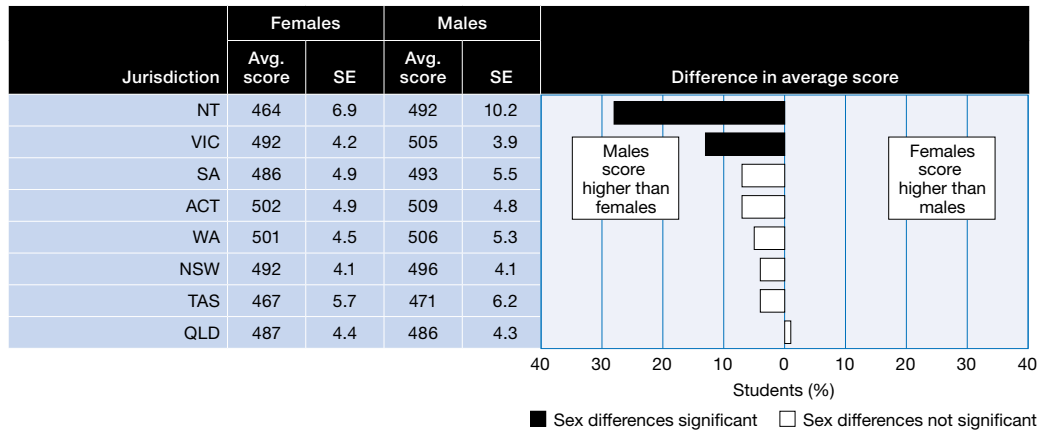


FIGURE 8.3 Average scores and differences in students' performance on the mathematical literacy scale, by jurisdiction and sex

8.2 Trends in performance for Australia by sex

Scientific literacy

- ▶ Figure 8.4 shows the average scores for Australian female and male performance in scientific literacy across the last four PISA cycles and illustrates the similarities in scientific literacy performance for females and males.
- ▶ Between 2006 and 2015, the performance of females declined significantly by 18 points and the performance of males declined significantly by 16 points.

Reading literacy

- ▶ Figure 8.4 shows the average scores for Australian female and male performance in reading literacy across the last six PISA cycles.
- ▶ Between 2000 and 2015, the average reading literacy score for females significantly declined by 27 points and the average score for males significantly declined by 25 points.
- ▶ Between 2000 and 2009, the change in performance for females was not significantly different, while the performance for males declined significantly by 17 points.
- ▶ Between 2009 and 2015, the change in performance for females declined significantly by 14 points, while the performance for males was not significantly different.

Mathematical literacy

- ▶ Figure 8.4 shows the average scores for Australian female and male performance in mathematical literacy across the last five PISA cycles.
- ▶ In 2015, females achieved an average score of 491 points, which was significantly lower than their average score in 2003 (by 31 points). The difference in performance for females between 2012 and 2015 was not significantly different.
- ▶ The difference in performance for males between 2003 and 2015, and also between 2012 and 2015 was significant. In 2015, males achieved an average score of 497 points, which was 30 points lower than in 2003 and 13 points lower than in 2012.

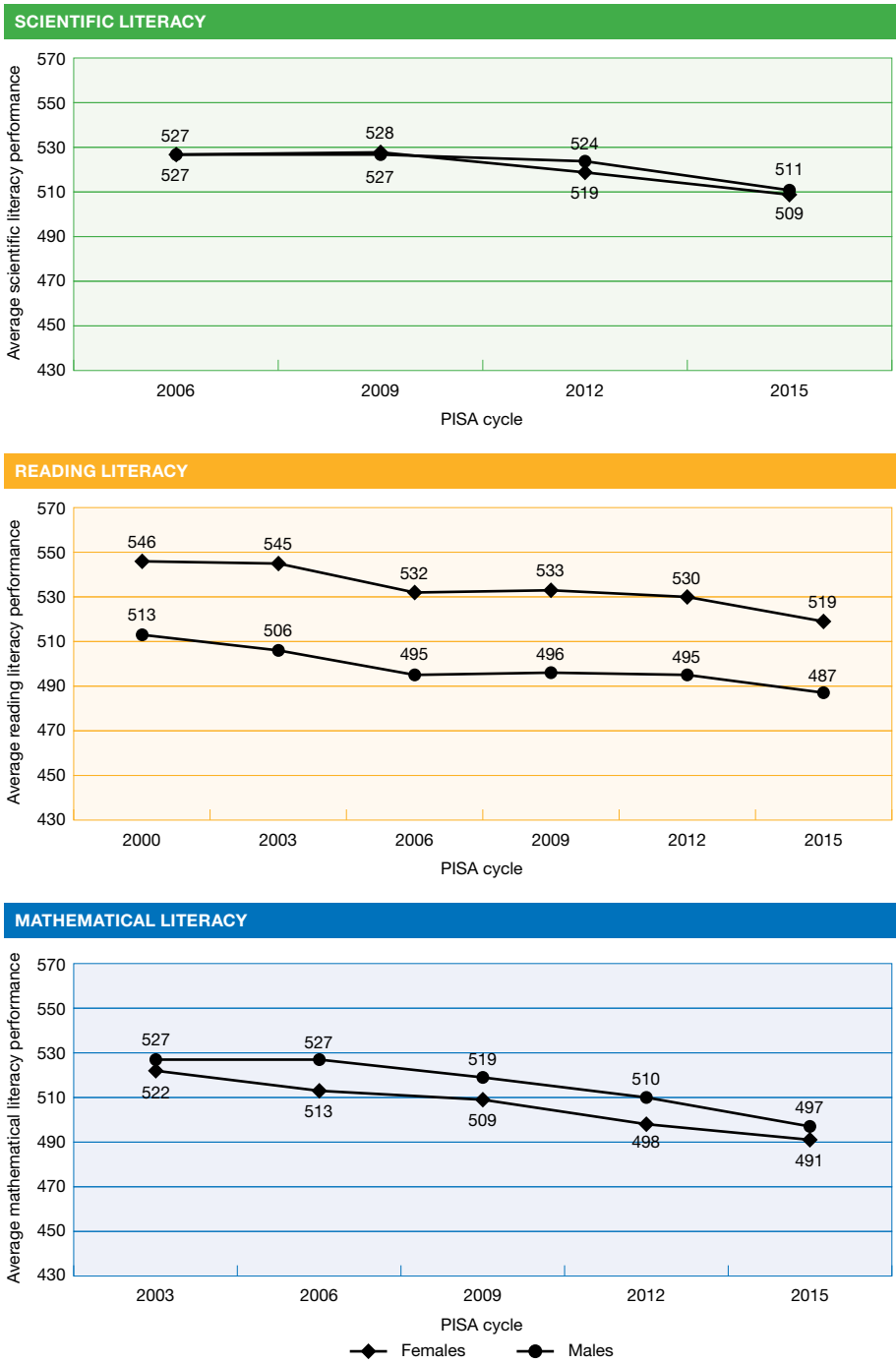


FIGURE 8.4 Average student performance for scientific, reading and mathematical literacy performance over time, for Australia, by sex

In PISA 2015, Australian Indigenous students were identified from information provided by their schools. Every student from a participating school who identified as Indigenous was sampled for Australia's PISA. Four per cent of the PISA sample was of Indigenous background. Table 9.1 shows the number of Australian Indigenous and non-Indigenous students who participated in PISA.

TABLE 9.1 Number and percentage of Australian PISA 2015 students, by Indigenous background

Indigenous background	N Students	Weighted N	Weighted (%)
Indigenous	2 807	10 659	4
Non-Indigenous	11 723	245 670	96

Note: N students is based on the achieved (unweighted) sample; weighted N is based on the number of students in the target population represented by the sample.

9.1 Performance in PISA 2015 by Indigenous background

- ▶ Indigenous students achieved significantly lower scores than non-Indigenous students in scientific, reading and mathematical literacy domains.
- ▶ There was an under-representation of Indigenous students at the higher end of the proficiency scale and an over-representation of Indigenous students at the lower end of the proficiency scale.
- ▶ Figure 9.1 shows Indigenous and non-Indigenous students' average performance along with their proportions across the scientific, reading and mathematical literacy proficiency scales.

Scientific literacy

- ▶ Indigenous students achieved an average score of 437 points, which was 76 points lower than the average score of 513 points achieved by non-Indigenous students. This average score difference equates to one proficiency level or around two-and-a-half years of schooling.
- ▶ Indigenous students performed significantly lower in scientific literacy than the OECD average (by 56 points), while non-Indigenous students performed significantly higher than the OECD average (by 20 points).
- ▶ 3% of Indigenous students were high performers in scientific literacy compared to 12% of high-performing non-Indigenous students.
- ▶ 42% of Indigenous students were low performers compared to 17% of non-Indigenous students.
- ▶ 31% of Indigenous students reached the National Proficient Standard in scientific literacy compared to 62% of non-Indigenous students.

Reading literacy

- ▶ Indigenous students achieved an average score of 435 points, which was 71 points lower than the average score of 506 points achieved by non-Indigenous students. This average score difference equates to one proficiency level or around two-and-a-third years of schooling.
- ▶ Indigenous students performed significantly lower in reading literacy than the OECD average (by 58 points), while non-Indigenous students performed significantly higher than the OECD average (by 13 points).
- ▶ 3% of Indigenous students were high performers in reading literacy compared to 11% of high-performing non-Indigenous students.

- ▶ 40% of Indigenous students were low performers compared to 17% of non-Indigenous students.
- ▶ 32% of Indigenous students reached the National Proficient Standard in reading literacy compared to 62% of non-Indigenous students.

Mathematical literacy

- ▶ Indigenous students achieved an average score of 427 points, which was 70 points lower than the average score of 497 points achieved by non-Indigenous students. This average score difference equates to about one proficiency level or around two-and-a-third years of schooling.
- ▶ Indigenous students performed significantly lower in mathematical literacy than the OECD average (by 63 points), while non-Indigenous students performed significantly higher than the OECD average (by 17 points).
- ▶ 3% of Indigenous students were high performers in mathematical literacy compared to 12% of high-performing non-Indigenous students.
- ▶ 49% of Indigenous students were low performers compared to 21% of low-performing non-Indigenous students.
- ▶ 25% of Indigenous students reached the National Proficient Standard in mathematical literacy compared to 57% of non-Indigenous students.

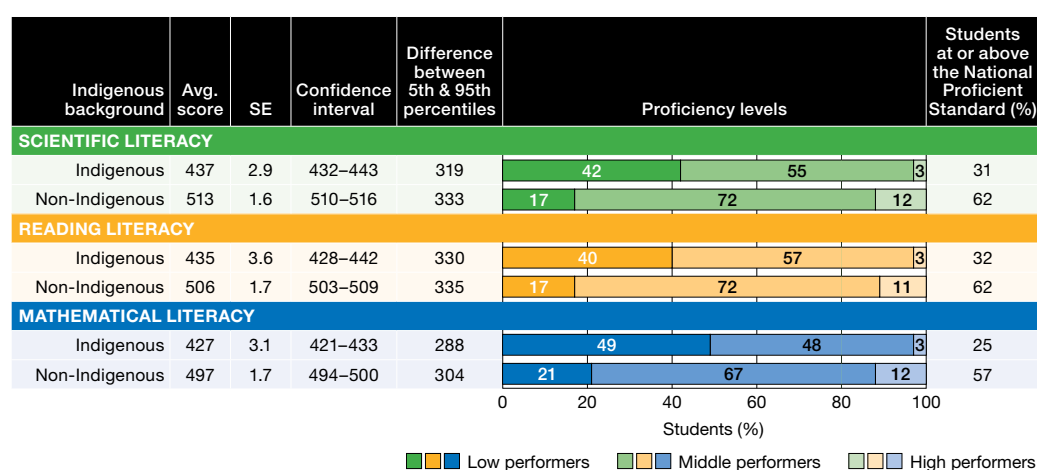


FIGURE 9.1 Average scores and proficiency levels in scientific, reading and mathematical literacy, by Indigenous background

9.2 Trends in performance by Indigenous background

Figure 9.2 shows the average performance in scientific, reading and mathematical literacy across the PISA cycles for Indigenous and non-Indigenous students.

Scientific literacy

Since 2006, the scientific literacy performance of Indigenous students has not changed significantly. However, there has been a significant decline of 16 points for non-Indigenous students, from an average score of 529 points in 2006 to 513 points in 2015. There was also a decline in performance for non-Indigenous students between 2009 and 2015 (of 17 points), and between 2012 and 2015 (of 11 points).

Reading literacy

The performance in reading literacy for Indigenous students was only found to vary significantly between 2000 and 2012, with a decline of 20 points. The decline in performance for non-Indigenous students between 2000 and each PISA cycle after 2003 was shown to be significant. Between 2000 and 2015, performance of non-Indigenous students significantly declined by 25 points.

Mathematical literacy

The performance in mathematical literacy for Indigenous students remained constant from 2003 to 2009; however, in 2012 there was a significant decrease in performance to an average score of 417 points, which was a decline of 23 points from 2009. The change in performance between 2009 and 2015 was also significant with a decline of 14 points. There have been a number of significant changes in mathematical literacy performance for non-Indigenous students between the PISA cycles. The decline between 2003 and 2012 was 19 points and the decline between 2012 and 2015 was 10 points.

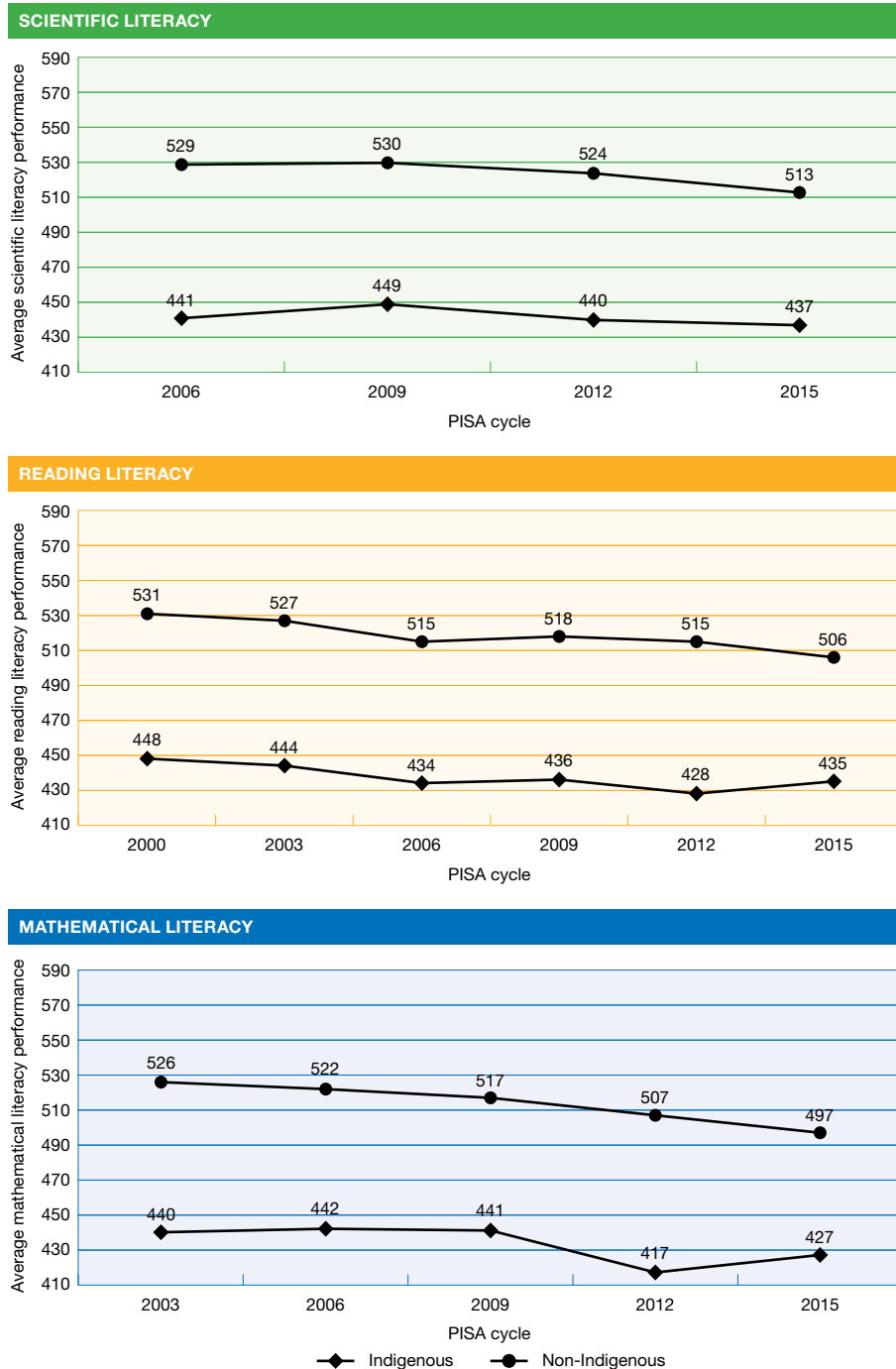


FIGURE 9.2 Average student performance for scientific, reading and mathematical literacy over time, by Indigenous background

The locations of schools in PISA were classified using the MCEETYA Schools Geographic Location Classification (Jones, 2004).¹⁴ Table 10.1 shows almost three-quarters of PISA 2015 participants attended schools in metropolitan areas (74%), one-quarter of students were from provincial areas and the remaining participants (1%) attended schools in remote areas.

TABLE 10.1 Number and percentage of Australian PISA 2015 students, by geographic location

Geographic location	N students	Weighted N	Weighted (%)
Metropolitan	9947	188606	74
Provincial	4065	64073	25
Remote	518	3650	1

Note: N students is based on the achieved (unweighted) sample; weighted N is based on the number of students in the target population represented by the sample.

10.1 Performance in PISA 2015 by geographic location

- ▶ Figure 10.1 shows students from different locations' average performance along with their proportions across the scientific, reading and mathematical literacy proficiency scales.
- ▶ Students from metropolitan schools achieved significantly higher scores than students from provincial schools or remote schools. Students from provincial schools and students in remote schools did not score significantly different to each other.
- ▶ There was a higher proportion of high performers from metropolitan schools compared to students from provincial or remote schools. Similarly, there was a lower proportion of low performers from metropolitan schools compared to students from provincial or remote schools.

Scientific literacy

- ▶ Students from metropolitan schools scored on average 26 points higher in scientific literacy (equivalent to around one year of schooling) than students who attended provincial schools. The average score difference between students from metropolitan schools and students from remote schools was even larger at 44 points on average (equivalent to around one-and-a-half years of schooling).
- ▶ The average performance for students from metropolitan schools was significantly higher than the OECD average (a difference of 24 points on average) but the average performance for students from remote schools was significantly lower than the OECD average (a difference of 20 points on average). The performance for students from provincial schools was not significantly different to that of students across the OECD.
- ▶ The proportion of high performers from metropolitan schools (13%) was twice the proportion of high performers from provincial and remote schools (7%).
- ▶ The proportion of low performers was 16% in metropolitan schools compared to 23% from provincial schools and 28% from remote schools.
- ▶ 64% of students from metropolitan schools did not reach the National Proficient Standard compared to 53% of students from provincial schools and 47% of students from remote schools.

¹⁴ The Reader's Guide provides more information about the MCEETYA Schools Geographic Location Classification.

Reading literacy

- ▶ Students from metropolitan schools scored on average 31 points higher in reading literacy (equivalent to around one year of schooling higher) than students who attended provincial schools. The average score difference between students from metropolitan schools and students from remote schools was even larger at 46 points on average or equivalent to about one-and-a-half years of schooling. No statistically significant differences in performance were found between students from provincial and remote schools.
- ▶ The average performance for students from metropolitan and provincial schools was significantly higher than for students across the OECD (by approximately 20 points), but the average performance for students from remote schools was significantly lower than the OECD average (by 28 points).
- ▶ The proportion of high performers from metropolitan schools (12%) was twice that of high performers from provincial and remote schools (7% and 6%).
- ▶ The proportion of low performers from metropolitan schools (16%) was half that of low performers from provincial and remote schools (24% and 28%).
- ▶ 64% of students from metropolitan schools reached the National Proficient Standard compared to 51% of students from provincial schools and 44% of students from remote schools.

Mathematical literacy

- ▶ Students from metropolitan schools scored on average 29 points higher in mathematical literacy (equivalent to around one year of schooling) than students who attended provincial schools. The average score difference between students from metropolitan schools and students from remote schools was even larger at 42 points on average (equivalent to around one-and-a-half years of schooling). The performance of students from provincial schools and students from remote schools was not significantly different.
- ▶ The performance for students from metropolitan schools was significantly higher than the OECD average (by 12 points), but the performance for students from provincial schools and remote schools was significantly lower than the OECD average (by 17 points and 30 points).
- ▶ The proportion of high performers from metropolitan schools (13%) was almost twice that of high performers from provincial schools (7%) and the proportion of high performers in remote schools was lower again with 5% of students performing at the high level.
- ▶ The proportion of low performers from metropolitan schools was 19% compared to 29% from provincial schools and 33% from remote schools.
- ▶ Almost two-thirds of students (59%) from metropolitan schools reached the National Proficient Standard compared to 46% of students from provincial schools and 40% of students from remote schools.

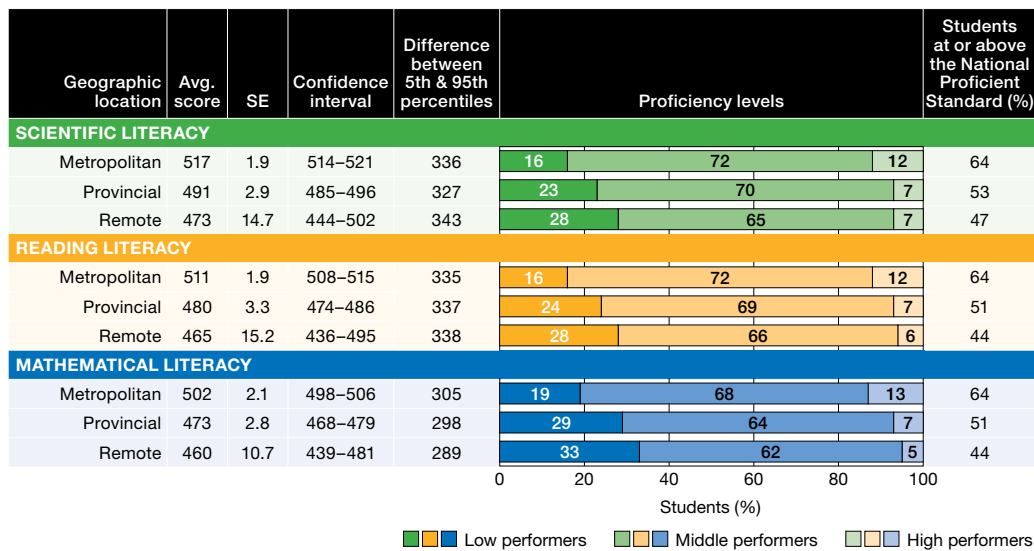


FIGURE 10.1 Average scores and proficiency levels in scientific, reading and mathematical literacy, by geographic location

10.2 Trends in performance by geographic location

Figure 10.2 shows the average performance in scientific, reading and mathematical literacy across the PISA cycles by geographic location.

Scientific literacy

- ▶ In a nine-year period, the average scientific literacy performance for students from metropolitan schools declined significantly by 13 points, from an average score of 531 points in 2006 to 517 points on average in 2015. The decline in performance for students from provincial schools was even larger, at 30 points, from an average score of 521 points in 2006 to 491 points on average in 2015, while the average change in performance for students from remote schools between 2006 and 2015 was not significantly different.

Reading literacy

- ▶ The average reading literacy performance between 2000 and 2015 was significantly lower for students from metropolitan schools (by 23 points) and for students from provincial schools (by 38 points). There were no significant differences in performance for students from remote schools between 2000 and 2015.
- ▶ Between 2000 and 2009, the average performance for students from provincial schools declined by 21 points, while there were no significant differences in performance for students from metropolitan or remote schools.
- ▶ Between 2009 and 2015, the change in performance was not significantly different, regardless of the geographic location of schools.

Mathematical literacy

- ▶ Between 2003 and 2015, the average mathematical literacy performance declined significantly for all geographic locations. There was a 27-point decline for students from metropolitan schools, a 42-point decline for students from provincial schools and a 33-point decline for students from remote schools.
- ▶ Between 2012 and 2015, significant differences were only found for students from metropolitan schools, with a decline of 10 points.

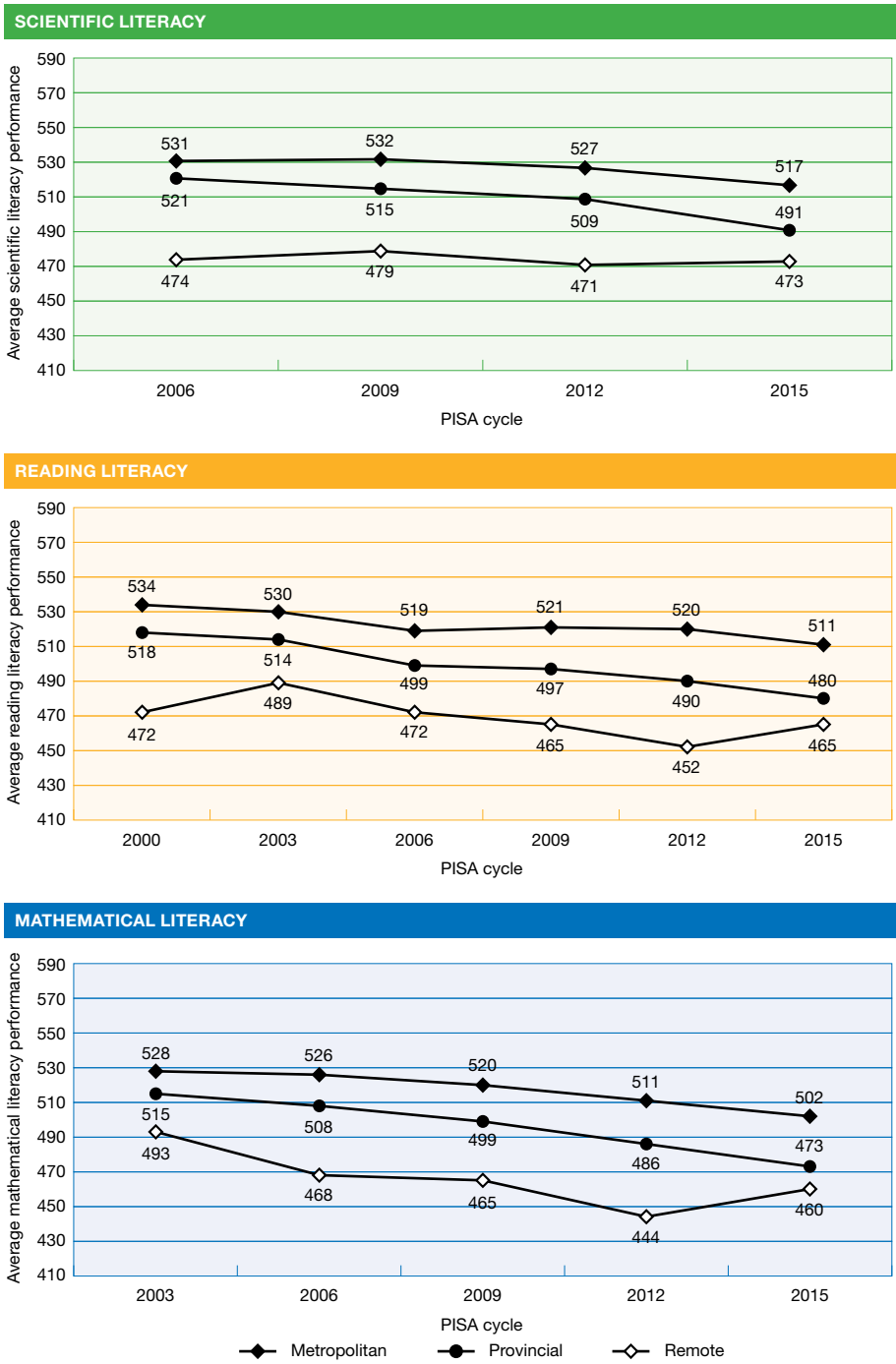


FIGURE 10.2 Average student performance for scientific, reading and mathematical literacy over time, by geographic location

Information about the socioeconomic background of students was collected in the student questionnaire. Students were asked several questions about their family and home background. This information was used to construct a measure of socioeconomic background: the economic, social and cultural status index (ESCS).¹⁵ Using this index, participating students were distributed into quartiles of socioeconomic background.

11.1 Performance in PISA 2015 by socioeconomic background

- ▶ On average, students from higher socioeconomic backgrounds performed at a significantly higher level than students from lower socioeconomic backgrounds.
- ▶ The proportion of high performers increased and the proportion of low performers decreased with each increase in socioeconomic quartile.
- ▶ Figure 11.1 shows the average performance and the proportion of students across the proficiency scales in scientific, reading and mathematical literacy by socioeconomic background.

Scientific literacy

- ▶ Students in the highest socioeconomic quartile achieved an average score of 559 points, which was substantially and significantly higher than the average score of 468 points for students in the lowest socioeconomic quartile. This difference of 91 points is equivalent to around three years of schooling or more than one proficiency level. The score difference between one quartile and the next was significant at approximately 30 points on average, which equates to about one-half of a proficiency level or about one year of schooling.
- ▶ The score for students in the highest socioeconomic quartile was significantly higher than that of the OECD average (with an average score difference of 66 points), while the score for students in the lowest socioeconomic quartile was significantly lower than for students across the OECD (with an average score difference of 25 points).
- ▶ Only 4% of students in the lowest socioeconomic quartile were high performers compared to 8% of students in the second socioeconomic quartile, 12% in the third socioeconomic quartile and 22% in the highest socioeconomic quartile.
- ▶ 29% of students in the lowest socioeconomic quartile were low performers compared to 19% of students in the second socioeconomic quartile, 13% in the third socioeconomic quartile and 7% in the highest socioeconomic quartile.

Reading literacy

- ▶ Students in the highest socioeconomic quartile achieved an average score of 551 points, which was higher than students in the lowest socioeconomic quartile, who achieved 462 points. This difference of 89 points was statistically significant and represents over one proficiency level or around three years of schooling. The difference between each socioeconomic quartile and the next was also significant, and equivalent to around one year of schooling.
- ▶ The score for students in the highest socioeconomic quartile was significantly higher than that of the OECD average (with an average score difference of 31 points), while the score for students in the lowest socioeconomic quartile was significantly lower than for students across the OECD (with an average score difference of 58 points).

¹⁵ The Reader's Guide provides more information about socioeconomic background and the ESCS index.

- ▶ Only 5% of students in the lowest socioeconomic quartile were high performers compared to 8% of students in the second socioeconomic quartile, 12% in the third socioeconomic quartile and 21% in the highest socioeconomic quartile.
- ▶ 30% of students in the lowest socioeconomic quartile were low performers compared to 20% of students in the second socioeconomic quartile, 13% in the third socioeconomic quartile and 7% in the highest socioeconomic quartile.

Mathematical literacy

- ▶ Students in the highest socioeconomic quartile achieved an average score of 541 points, which was higher than students in the lowest socioeconomic quartile, who achieved 455 points. This difference of 86 points higher was statistically significant and represents over one proficiency level or almost three years of schooling. The difference between each socioeconomic quartile and the next was also significant, at around 30 points on average, and equivalent to around one year of schooling.
- ▶ The score for students in the highest socioeconomic quartile was significantly higher than that of the OECD average (with an average score difference of 51 points), while the score for students in the lowest socioeconomic quartile was significantly lower than for students across the OECD (with an average score difference of 35 points).
- ▶ Only 4% of students in the lowest socioeconomic quartile were high performers compared to 7% in the second socioeconomic quartile, 12% in the third socioeconomic quartile and 23% in the highest socioeconomic quartile.
- ▶ 35% of students in the lowest socioeconomic quartile were low performers compared to 24% in the second socioeconomic quartile, 16% in the third socioeconomic quartile, and 9% in the highest socioeconomic quartile.

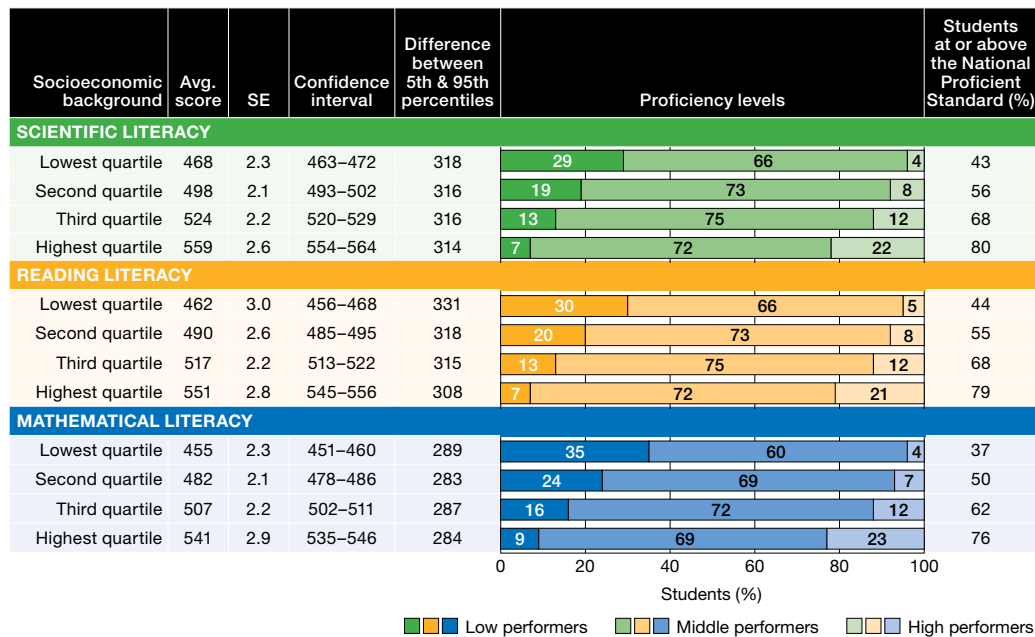


FIGURE 11.1 Average scores and proficiency levels in scientific, reading and mathematical literacy, by socioeconomic background

11.2 Trends in performance by socioeconomic background

Figure 11.2 shows the average performance in scientific, reading and mathematical literacy across the PISA cycles by socioeconomic background.

Scientific literacy

- ▶ Between 2006 and 2015, there was a significant decline in scientific literacy performance for each of the quartiles of socioeconomic background. Over a nine-year period, the average performance for students in the lowest quartile and second quartile of socioeconomic background declined by approximately 18 points, while the decline for students in the third quartile and highest quartile of socioeconomic background was smaller at 16 points and 13 points.

Reading literacy

- ▶ Over a 15-year period, from 2000 to 2015, the average reading literacy performance for students in the highest quartile of socioeconomic background declined by 32 points. The change in performance between 2000 and 2009 showed a 20-point decline and between 2009 and 2015 there was an 11-point decline.
- ▶ For students in the lowest quartile of socioeconomic background, there was a significant decline of 21 points between 2000 and 2015, whereas the change in performance between 2000 and 2009, and between 2009 and 2015 was not significantly different.
- ▶ For students in the second and third quartiles of socioeconomic background, performance declined significantly between 2000 and 2015 (24 points for students in the second quartile and 26 points for students in the third quartile), and performance declined significantly between 2009 and 2015 (with a 13-point decline for students in the second quartile and a 15-point decline for students in the third quartile), but the change in performance was not significantly different between 2000 and 2009.

Mathematical literacy

- ▶ Over a 12-year period, from 2003 to 2015, mathematical literacy performance declined significantly for each socioeconomic quartile. There was a 23-point decline for students in the lowest socioeconomic quartile, a 30-score point decline for students in the second socioeconomic quartile, a 31-score point decline for students in the third socioeconomic quartile and a 32-score point decline for students in the highest socioeconomic quartile.
- ▶ The mathematical literacy performance for students in the second and third socioeconomic quartiles changed significantly between 2012 and 2015, with a decline of 9 points and 15 points, while the performances for students in the other socioeconomic quartiles were not significantly different.

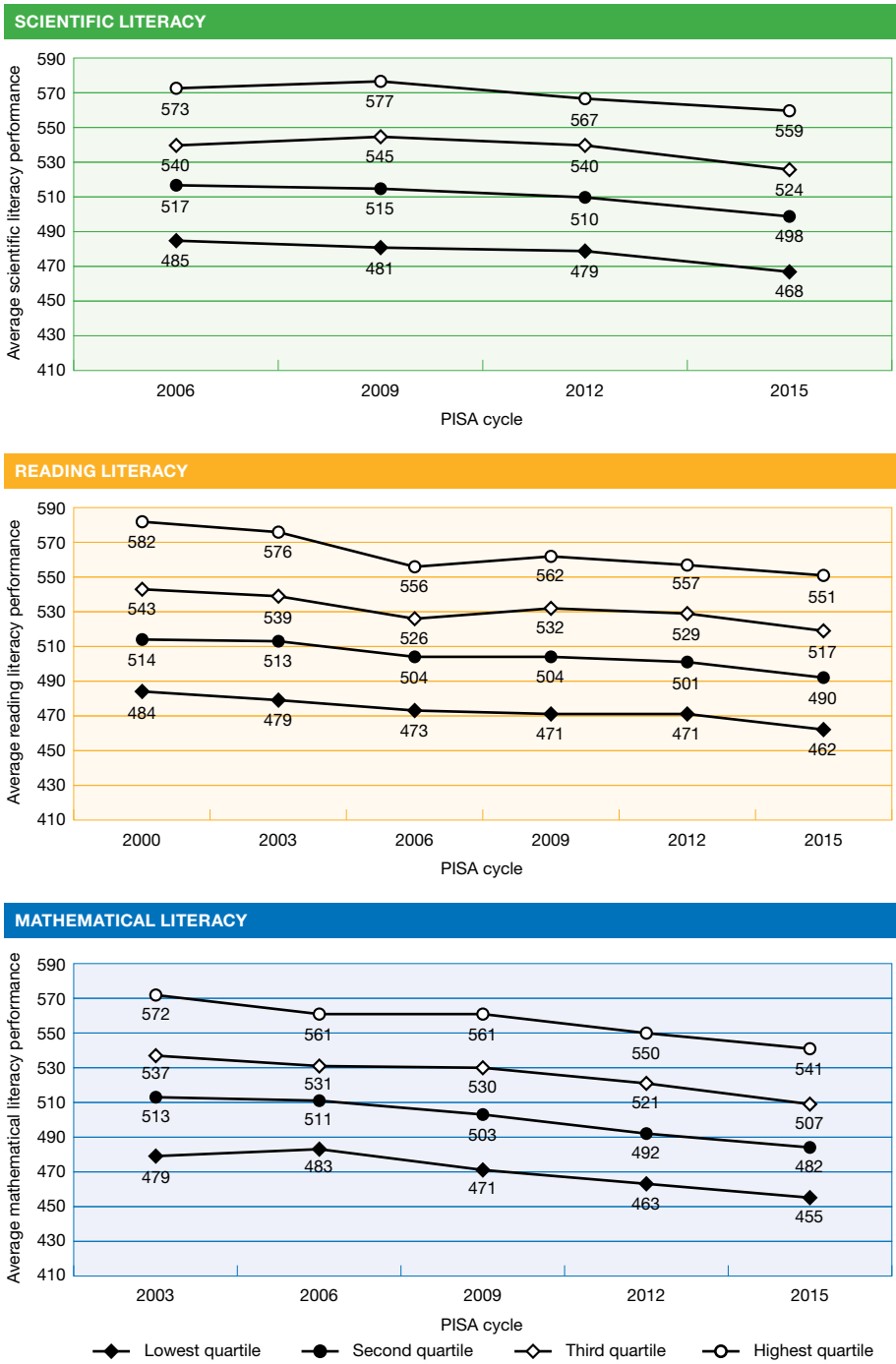


FIGURE 11.2 Average student performance for scientific, reading and mathematical literacy over time, by socioeconomic background

The student questionnaire collected information about the country of birth of students and their parents. This data was used to create a measure of immigrant status, with three categories: Australian-born, first-generation and foreign-born.¹⁶

Table 12.1 shows that approximately half the students to sit PISA 2015 were Australian-born (53%), 30% were first-generation and 12% of students were foreign-born.

TABLE 12.1 Number and percentage of Australian PISA 2015 students, by immigrant background

Immigrant background	N students	Weighted N	Weighted (%)
Australian-born	8 483	137 006	53
First-generation	3 795	76 985	30
Foreign-born	1 465	31 468	12

Note: N students is based on the achieved (unweighted) sample; weighted N is based on the number of students in the target population represented by the sample. The weighted % doesn't sum to 100% as 4% of students didn't provide these details.

12.1 Performance in PISA 2015 by immigrant background

- ▶ Figure 12.1 shows the average performance and the proportion of students across the proficiency scales in scientific, reading and mathematical literacy by immigrant background.
- ▶ Australian-born students performed at a level significantly lower than first-generation students and statistically similar to foreign-born students across all assessment domains while foreign-born students performed at a level significantly lower than first-generation students in scientific literacy and reading literacy and not significantly different in mathematical literacy.
- ▶ Generally, the proportion of low-performing Australian-born and foreign-born students was higher than the proportion of low-performing first-generation students, and the proportion of high-performing Australian-born students was lower than for first-generation students or foreign-born students.

Scientific literacy

- ▶ Australian-born students achieved an average scientific literacy score of 510 points, and performed equivalent to about one-third of a year of schooling lower than first-generation students, who achieved an average score of 520 points. Foreign-born students achieved an average score of 505 points, and performed equivalent to about half a year of schooling lower than first-generation students.
- ▶ The performance for all three immigrant background groups in scientific literacy was significantly higher than for students across the OECD. The average score differences were 12 points between foreign-born students and the OECD average, 17 points between Australian-born students and the OECD average and 27 points between first-generation students and the OECD average.
- ▶ 10% of Australian-born students were high performers compared to 13% of first-generation students and 12% of foreign-born students. At the lower end of the scientific literacy proficiency scale, 17% per cent of Australian-born students were low performers compared to 15% of first-generation students and 20% of foreign-born students.
- ▶ 61% of Australian-born students reached the National Proficient Standard compared to 64% of first-generation students and 58% of foreign-born students.

¹⁶ The Reader's Guide provides more information about immigrant status.

Reading literacy

- ▶ Australian-born students achieved an average reading literacy score of 501 points, which was significantly lower than first-generation students (517 points). Foreign-born students achieved an average score of 500 points and also performed significantly lower than first-generation students. In this instance, the difference in average scores between Australian-born and first-generation students, and between foreign-born and first-generation students represents around half a year of schooling. The performance of Australian-born students was not statistically different to that of foreign-born students.
- ▶ The performance of Australian-born and first-generation students was significantly higher than the OECD average (by 8 points and 24 points), while the performance of foreign-born students was not significantly different to that of students across the OECD.
- ▶ 10% of Australian-born students were high performers compared to 14% of first-generation students and 12% of foreign-born students. At the lower end of the reading literacy proficiency scale, 18% of Australian-born students were low performers compared to 14% of first-generation students and 21% of foreign-born students.
- ▶ Similar proportions of foreign-born and Australian-born students reached the National Proficient Standard (59% and 60%), while the proportion of first-generation students who reached the National Proficient Standard was slightly higher at 66%.

Mathematical literacy

- ▶ Australian-born students achieved an average mathematical literacy score of 491 points, which was significantly lower than first-generation students (505 points). The difference between these average scores is equivalent to around half a year of schooling. Foreign-born students achieved an average score of 497 points, which was not significantly different to the performance of first-generation students.
- ▶ The mathematical literacy performance of first-generation students was significantly higher than the OECD average (by 15 points), while the performance of Australian-born and foreign-born students was not significantly different to that of students across the OECD.
- ▶ 10% of Australian-born students were high performers compared to 14% of first-generation students and 14% of foreign-born students. At the lower end of the mathematical literacy proficiency scale, the proportions of low performers for Australian-born and foreign-born students were similar (22%), while the proportion of first-generation students was 18%.
- ▶ 55% of Australian-born students reached the National Proficient Standard compared to 60% of first-generation students and 56% of foreign-born students.

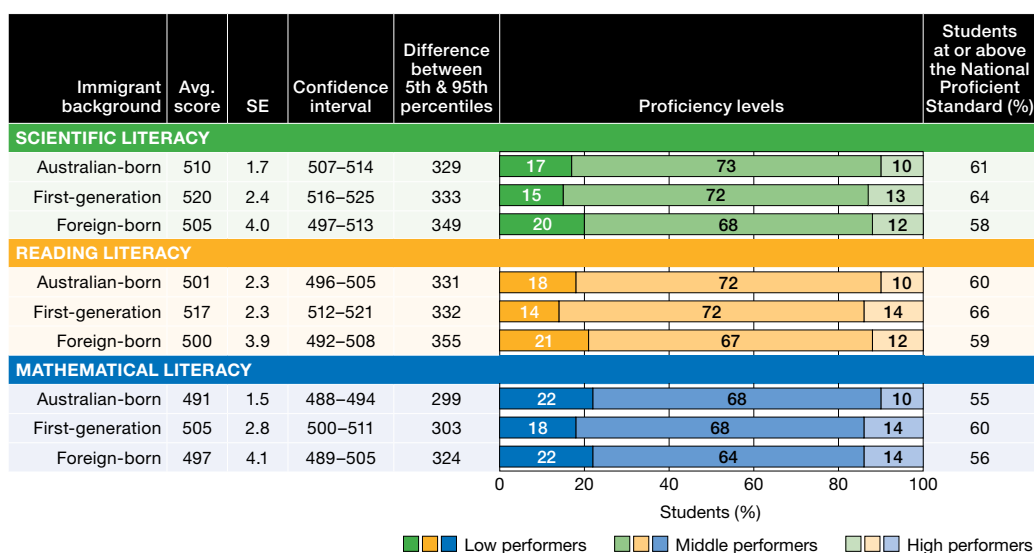


FIGURE 12.1 Average scores and proficiency levels in scientific, reading and mathematical literacy, by immigrant background

12.2 Trends in performance by immigrant background

Figure 12.2 shows the average performance in scientific, reading and mathematical literacy across the PISA cycles by immigrant background.

Scientific literacy

- ▶ Over the nine-year period, from 2006 to 2015, the scientific literacy performance for Australian-born and foreign-born students declined significantly, while the performance for first-generation students was not significantly different. For Australian-born students, the score declined by 18 points to 510 points on average, and for foreign-born students the score declined by 21 points to 505 points on average.

Reading literacy

- ▶ Over a 15-year period, from 2000 to 2015, the reading literacy performance for Australian-born students declined significantly by 29 points, and the performance for first-generation students declined significantly by 20 points, while the performance for foreign-born students was not significantly different over this time.
- ▶ Between 2000 and 2009, the average score for Australian-born students declined significantly by 18 points, and there was no significant change in performance for first-generation students and foreign-born students.
- ▶ Between 2009 and 2015, performance declined significantly across all three immigrant background groups. The decline in performance was 11 points for Australian-born students, 10 points for first-generation students and 17 points for foreign-born students.

Mathematical literacy

- ▶ Between 2003 and 2015, mathematical literacy performance declined significantly for all immigrant background groups. There was a 35-point decline for Australian-born students, a 17-point decline for first-generation students and a 28-point decline for foreign-born students.
- ▶ Between 2012 and 2015, the mathematical literacy performance for Australian-born students declined significantly by 9 points and the performance for first-generation students declined significantly by 13 points, whereas there was no significant difference in the performance of foreign-born students during this period.

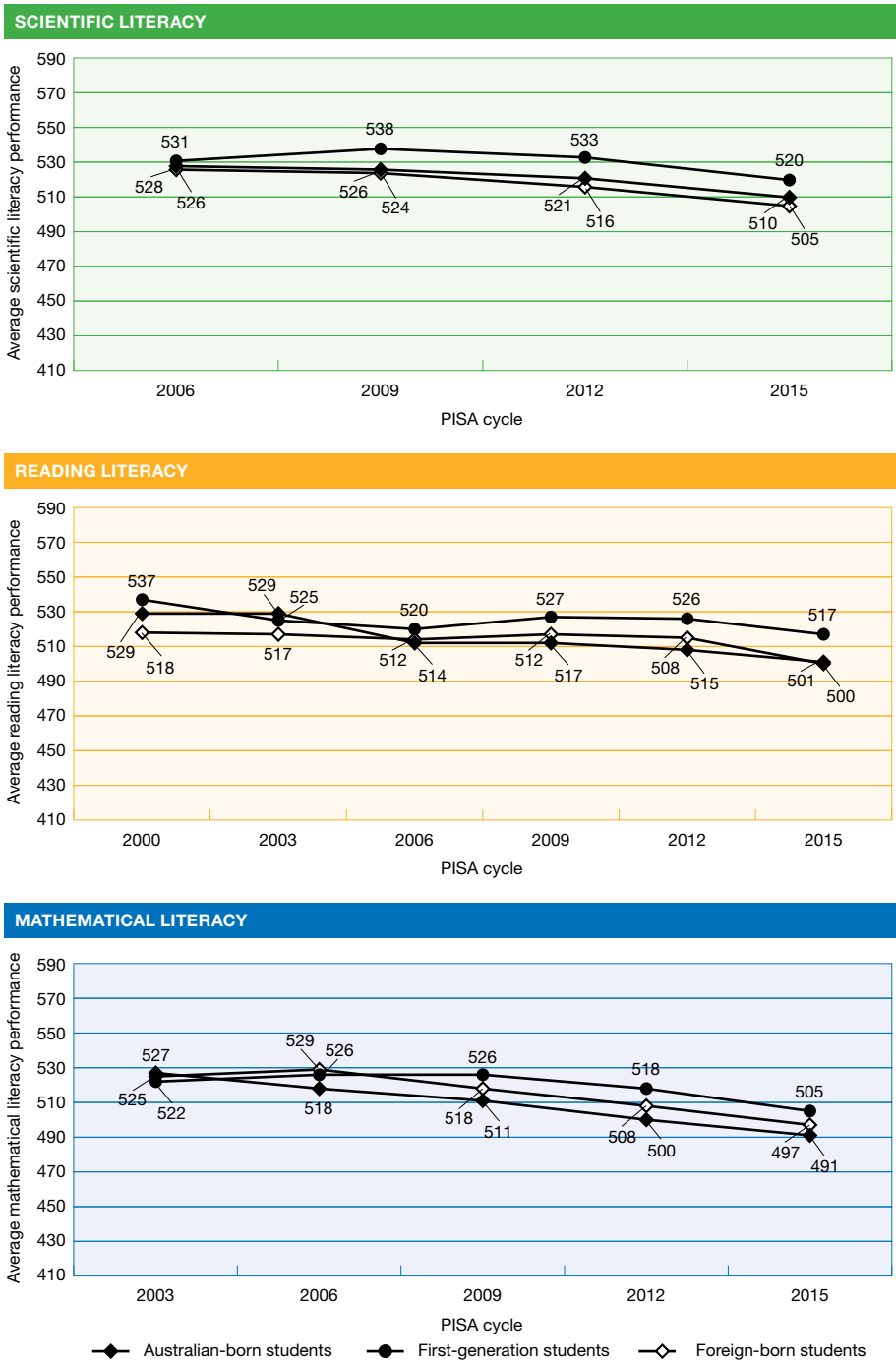


FIGURE 12.2 Average student performance for scientific, reading and mathematical literacy over time, by immigrant background

The student questionnaire asked students which language was spoken in their homes most of the time. A measure of language spoken at home was derived to identify students who spoke English at home and students who spoke a language other than English at home.

In Australia, 87% of PISA 2015 participants indicated that English was spoken at home most of the time; and 11% of students indicated they spoke a language other than English at home most of the time (Table 13.1).

TABLE 13.1 Number and percentage of Australian PISA 2015 students, by language background

Language background	N students	Weighted N	Weighted (%)
English spoken at home	12 626	221 894	87
Language other than English spoken at home	1 477	28 648	11

Note: N students is based on the achieved (unweighted) sample; weighted N is based on the number of students in the target population represented by the sample. The weighted % doesn't sum to 100% as 2% of students didn't provide these details.

13.1 Performance in PISA 2015 by language background

- ▶ Figure 13.1 shows the average performance and the proportion of students across the proficiency scales in scientific, reading and mathematical literacy by language background.
- ▶ Students who spoke English at home most of the time performed significantly higher in scientific literacy and reading literacy than students who spoke a language other than English at home most of the time.
- ▶ Generally, the proportion of low-performing students who spoke English at home most of the time was lower than the proportion of low-performing students who spoke a language other than English most of the time, while the proportions of high performers for both language background groups were similar.

Scientific literacy

- ▶ Students who spoke English at home achieved an average scientific literacy score of 515 points, which was 27 points higher than for students who spoke a language other than English at home. This difference equates to almost half a proficiency level or about one year of schooling.
- ▶ Students who spoke English at home performed significantly higher than the OECD average (by 22 points), whereas there was no significant difference in performance between students who spoke a language other than English and the OECD average.
- ▶ 12% of students who spoke English at home and 10% of students who spoke a language other than English at home were high performers, while 16% of students who spoke English at home and 27% of students who spoke a language other than English at home were low performers.
- ▶ Approximately two-thirds (63%) of students who spoke English at home reached the National Proficient Standard compared to half of the students who spoke a language other than English at home.

Reading literacy

- ▶ Students who spoke English at home achieved an average reading literacy score of 507 points, a significant difference of 20 points higher than those students who spoke a language other than English at home. This average score difference equates to around two-thirds of a year of schooling.
- ▶ Students who spoke English at home performed significantly higher than the OECD average (by 14 points), whereas there was no significant difference in performance between students who spoke a language other than English and the OECD average.
- ▶ The same proportions of high performers (11%) were found in both language background groups, while there were more low performers who spoke a language other than English at home (26%) than low performers who spoke English at home (16%).

Mathematical literacy

- ▶ The mathematical literacy performance of students who spoke English at home was not significantly different to students who spoke a language other than English at home.
- ▶ The performance of students who spoke English at home was significantly higher than the OECD average, by 6 points, while there were no significant differences between students who spoke a language other than English and the OECD average.
- ▶ 11% of students who spoke English at home and 13% of students who spoke a language other than English at home were high performers, while 21% of students who spoke English at home and 27% of students who spoke a language other than English at home were low performers.
- ▶ 57% of students who spoke English at home reached the National Proficient Standard, while half (52%) of the students who spoke a language other than English at home reached this standard.

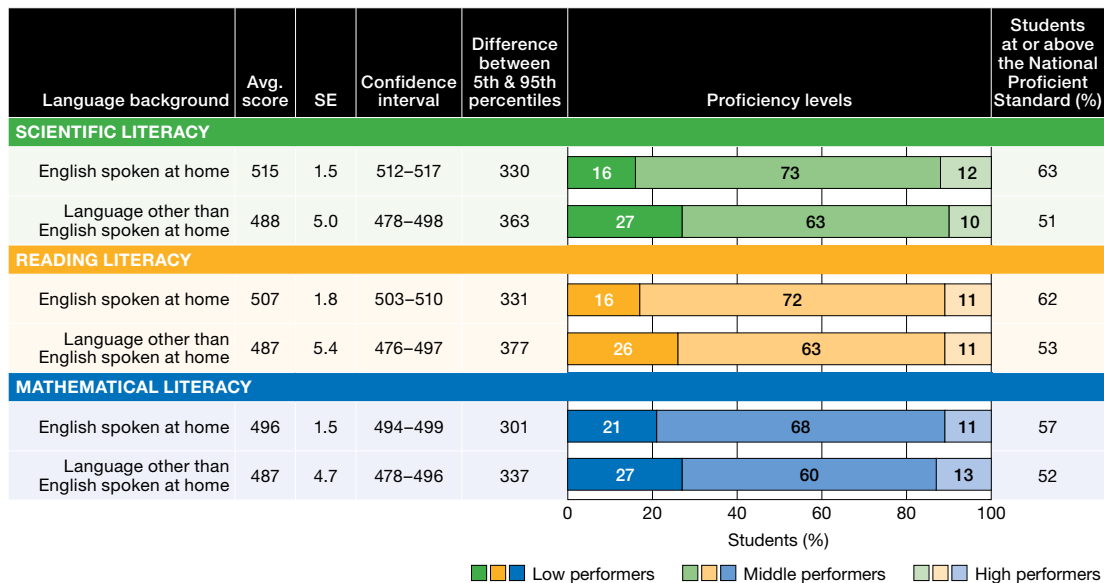


FIGURE 13.1 Average scores and proficiency levels in scientific, reading and mathematical literacy, by language background

13.2 Trends in performance by language background

The average performance in scientific, reading and mathematical literacy across the PISA cycles for students who spoke English at home most of the time and students who spoke a language other than English at home most of the time are shown in Figure 13.2.

Scientific literacy

- ▶ The average scientific literacy performance between 2006 and 2015 for students who spoke English at home was significantly different, with a decrease in score of 16 points, while the change in performance for students who spoke a language other than English at home was not significantly different.
- ▶ From 2012 to 2015, the performance declined significantly by 11 points for students who spoke English at home, and by 21 points for students who spoke a language other than English at home.

Reading literacy

- ▶ From 2003¹⁷ to 2015, the reading literacy performance declined significantly by 22 points for both language background groups.
- ▶ Between 2009 and 2015, the reading literacy performance declined significantly for students who spoke English at home (by 12 points). Between 2012 and 2015, there was no significant change in the performance for students who spoke English at home.
- ▶ Between 2009 and 2015, the reading literacy performance was not significantly different for students who spoke a language other than English at home, while between 2012 and 2015, reading literacy performance for students who spoke a language other than English at home declined significantly, by 20 points.

Mathematical literacy

- ▶ Between 2003 and 2015, there was a 31-point decline in mathematical literacy performance for students who spoke English at home, and a 28-point decline for students who spoke a language other than English at home.
- ▶ Between 2012 and 2015, mathematical literacy performance also declined; however, the change in performance was larger for students who spoke a language other than English at home (by 22 points), compared to students who spoke English at home (by 9 points).

¹⁷ The question about students' language background from PISA 2003 was asked in a different way to PISA 2000.

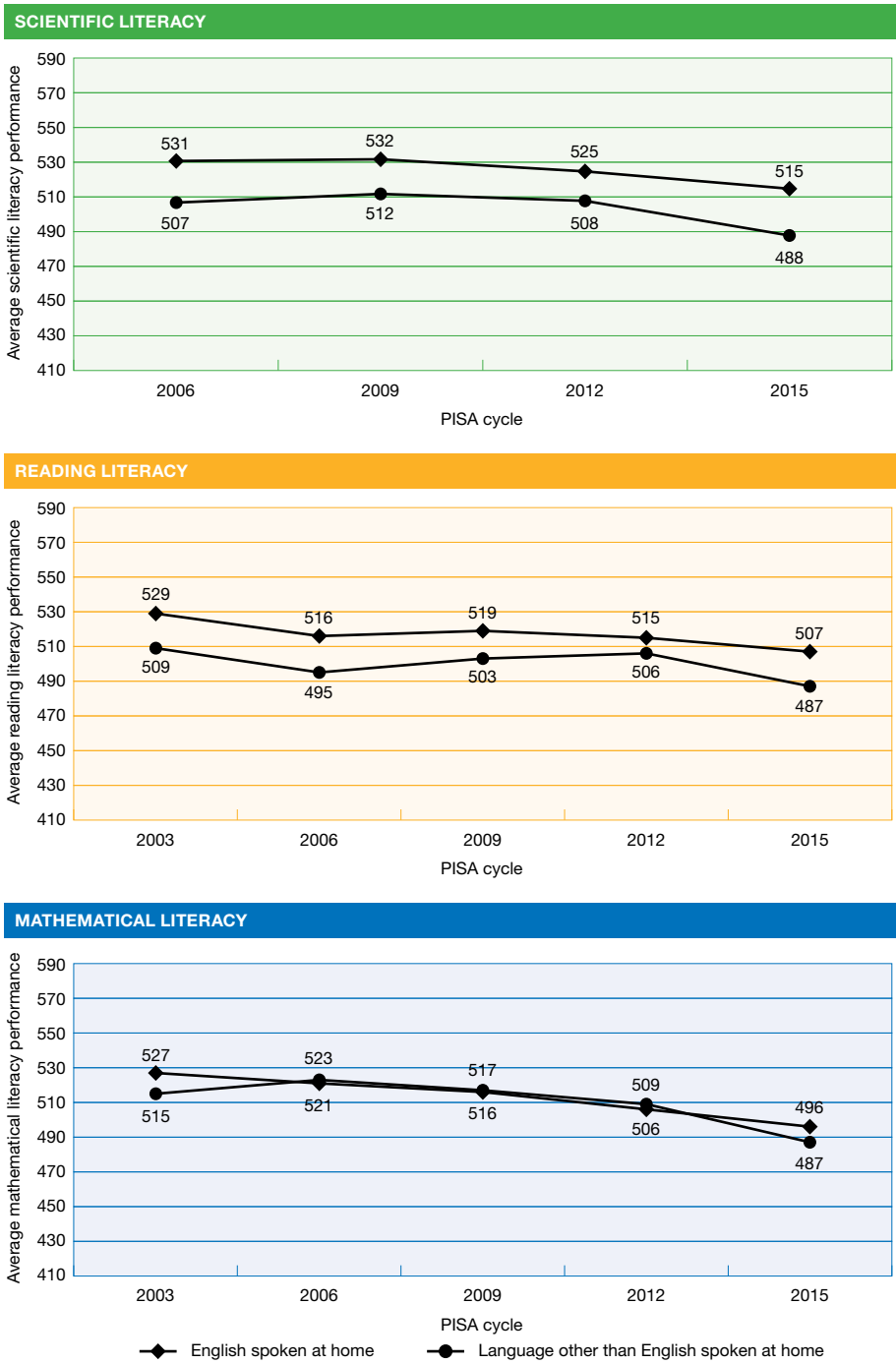


FIGURE 13.2 Average student performance for scientific, reading and mathematical literacy over time, by language background

Appendices

Appendix A

These comparisons show that:

- ▶ the Australian Capital Territory performed significantly lower than 2 countries and not significantly different to 8 countries
- ▶ Western Australia performed significantly lower than 6 countries and not significantly different to 6 countries
- ▶ Victoria performed significantly lower than 9 countries and not significantly different to 8 countries
- ▶ New South Wales, South Australia and Queensland performed significantly lower than 9 countries and not significantly different to 13 countries
- ▶ the Northern Territory performed significantly lower than 20 countries and not significantly different to 15 countries
- ▶ Tasmania performed significantly lower than 29 countries and not significantly different to 8 countries.

TABLE A Scientific literacy multiple comparison table for the Australian jurisdictions and PISA 2015 countries/economies

		Country/ economy	Singapore	Japan	Estonia	Chinese Taipei	Finland	Macao (China)	Canada	Vietnam
		Avg. score	556	538	534	532	531	529	528	525
Jurisdiction	Avg. score	SE	1.2	3.0	2.1	2.7	2.4	1.1	2.1	3.9
ACT	527	3.8	▼	▼	●	●	●	●	●	●
WA	521	3.7	▼	▼	▼	▼	▼	▼	●	●
VIC	513	3.3	▼	▼	▼	▼	▼	▼	▼	▼
NSW	508	3.0	▼	▼	▼	▼	▼	▼	▼	▼
SA	508	3.9	▼	▼	▼	▼	▼	▼	▼	▼
QLD	507	3.3	▼	▼	▼	▼	▼	▼	▼	▼
NT	489	5.9	▼	▼	▼	▼	▼	▼	▼	▼
TAS	483	4.0	▼	▼	▼	▼	▼	▼	▼	▼

		Country/ economy	Hong Kong (China)	B-S-J-G (China)	Korea	New Zealand	Slovenia	United Kingdom	Germany	Netherlands
		Avg. score	523	518	516	513	513	509	509	509
Jurisdiction	Avg. score	SE	2.5	4.6	3.1	2.4	1.3	2.6	2.7	2.3
ACT	527	3.8	●	●	▲	▲	▲	▲	▲	▲
WA	521	3.7	●	●	●	●	▲	▲	▲	▲
VIC	513	3.3	▼	●	●	●	●	●	●	●
NSW	508	3.0	▼	●	●	●	●	●	●	●
SA	508	3.9	▼	●	●	●	●	●	●	●
QLD	507	3.3	▼	●	●	●	●	●	●	●
NT	489	5.9	▼	▼	▼	▼	▼	▼	▼	▼
TAS	483	4.0	▼	▼	▼	▼	▼	▼	▼	▼

		Country/ economy	Switzerland	Ireland	Belgium	Denmark	Poland	Portugal	Norway	United States
		Avg. score	506	503	502	502	501	501	498	496
Jurisdiction	Avg. score	SE	2.9	2.4	2.3	2.4	2.5	2.4	2.3	3.2
ACT	527	3.8	▲	▲	▲	▲	▲	▲	▲	▲
WA	521	3.7	▲	▲	▲	▲	▲	▲	▲	▲
VIC	513	3.3	●	▲	▲	▲	▲	▲	▲	▲
NSW	508	3.0	●	●	●	●	●	●	▲	▲
SA	508	3.9	●	●	●	●	●	●	▲	▲
QLD	507	3.3	●	●	●	●	●	●	▲	▲
NT	489	5.9	▼	▼	▼	▼	●	●	●	●
TAS	483	4.0	▼	▼	▼	▼	▼	▼	▼	▼

		Country/ economy	Austria	France	Sweden	OECD average	Czech Republic	Spain	Latvia	Russian Federation
		Avg. score	495	495	493	493	493	493	490	487
Jurisdiction	Avg. score	SE	2.4	2.1	3.6	0.4	2.3	2.1	1.6	2.9
ACT	527	3.8	▲	▲	▲	▲	▲	▲	▲	▲
WA	521	3.7	▲	▲	▲	▲	▲	▲	▲	▲
VIC	513	3.3	▲	▲	▲	▲	▲	▲	▲	▲
NSW	508	3.0	▲	▲	▲	▲	▲	▲	▲	▲
SA	508	3.9	▲	▲	▲	▲	▲	▲	▲	▲
QLD	507	3.3	▲	▲	▲	▲	▲	▲	▲	▲
NT	489	5.9	●	●	●	●	●	●	●	●
TAS	483	4.0	▼	▼	●	▼	▼	▼	●	●

		Country/ economy	Luxembourg	Italy	Hungary	Lithuania	Croatia	Iceland	Israel	Malta
		Avg. score	483	481	477	475	475	473	467	465
Jurisdiction	Avg. score	SE	1.1	2.5	2.4	2.7	2.5	1.7	3.4	1.6
ACT	527	3.8	▲	▲	▲	▲	▲	▲	▲	▲
WA	521	3.7	▲	▲	▲	▲	▲	▲	▲	▲
VIC	513	3.3	▲	▲	▲	▲	▲	▲	▲	▲
NSW	508	3.0	▲	▲	▲	▲	▲	▲	▲	▲
SA	508	3.9	▲	▲	▲	▲	▲	▲	▲	▲
QLD	507	3.3	▲	▲	▲	▲	▲	▲	▲	▲
NT	489	5.9	●	●	●	▲	▲	▲	▲	▲
TAS	483	4.0	●	●	●	●	●	▲	▲	▲

		Country/ economy	Slovak Republic	Greece	Chile	Bulgaria	United Arab Emirates	Uruguay	Romania	Cyprus
		Avg. score	461	455	447	446	437	435	435	433
Jurisdiction	Avg. score	SE	2.6	3.9	2.4	4.4	2.4	2.2	3.2	1.4
ACT	527	3.8	▲	▲	▲	▲	▲	▲	▲	▲
WA	521	3.7	▲	▲	▲	▲	▲	▲	▲	▲
VIC	513	3.3	▲	▲	▲	▲	▲	▲	▲	▲
NSW	508	3.0	▲	▲	▲	▲	▲	▲	▲	▲
SA	508	3.9	▲	▲	▲	▲	▲	▲	▲	▲
QLD	507	3.3	▲	▲	▲	▲	▲	▲	▲	▲
NT	489	5.9	▲	▲	▲	▲	▲	▲	▲	▲
TAS	483	4.0	▲	▲	▲	▲	▲	▲	▲	▲

		Country/ economy	Moldova	Albania	Turkey	Trinidad and Tobago	Thailand	Costa Rica
		Avg. score	428	427	425	425	421	420
Jurisdiction	Avg. score	SE	2.0	3.3	3.9	1.4	2.8	2.1
ACT	527	3.8	▲	▲	▲	▲	▲	▲
WA	521	3.7	▲	▲	▲	▲	▲	▲
VIC	513	3.3	▲	▲	▲	▲	▲	▲
NSW	508	3.0	▲	▲	▲	▲	▲	▲
SA	508	3.9	▲	▲	▲	▲	▲	▲
QLD	507	3.3	▲	▲	▲	▲	▲	▲
NT	489	5.9	▲	▲	▲	▲	▲	▲
TAS	483	4.0	▲	▲	▲	▲	▲	▲

		Country/ economy	Qatar	Colombia	Mexico
		Avg. score	418	416	416
Jurisdiction	Avg. score	SE	1.0	2.4	2.1
ACT	527	3.8	▲	▲	▲
WA	521	3.7	▲	▲	▲
VIC	513	3.3	▲	▲	▲
NSW	508	3.0	▲	▲	▲
SA	508	3.9	▲	▲	▲
QLD	507	3.3	▲	▲	▲
NT	489	5.9	▲	▲	▲
TAS	483	4.0	▲	▲	▲

Note: Read across the row to compare a jurisdiction's performance with the performance of each country/economy listed in the column heading.

- ▲ Average performance statistically significantly higher than in comparison country/economy
- No statistically significant difference from comparison country/economy
- ▼ Average performance statistically significantly lower than in comparison country/economy

Appendix B

These comparisons show that:

- ▶ the Australian Capital Territory performed significantly lower than 4 countries and not significantly different to 9 countries
- ▶ Western Australia performed significantly lower than 6 countries and not significantly different to 17 countries
- ▶ Victoria performed significantly lower than 7 countries and not significantly different to 15 countries
- ▶ South Australia and New South Wales performed significantly lower than 9 countries and not significantly different to 17 countries
- ▶ Queensland performed significantly lower than 11 countries and not significantly different to 16 countries
- ▶ Tasmania performed significantly lower than 31 countries and not significantly different to 9 countries
- ▶ the Northern Territory performed significantly lower than 26 countries and not significantly different to 15 countries.

TABLE B Reading literacy multiple comparison table for the Australian jurisdictions and PISA 2015 countries/economies

		Country/ economy	Singapore	Hong Kong (China)	Canada	Finland	Ireland	Estonia	Korea	Japan
		Avg. score	535	527	527	526	521	519	517	516
Jurisdiction	Avg. score	SE	1.6	2.7	2.3	2.5	2.5	2.2	3.5	3.2
ACT	516	4.5	▼	▼	▼	▼	●	●	●	●
WA	507	4.2	▼	▼	▼	▼	▼	▼	●	●
VIC	507	3.7	▼	▼	▼	▼	▼	▼	▼	●
SA	503	3.8	▼	▼	▼	▼	▼	▼	▼	▼
NSW	502	3.0	▼	▼	▼	▼	▼	▼	▼	▼
QLD	500	3.7	▼	▼	▼	▼	▼	▼	▼	▼
TAS	476	4.4	▼	▼	▼	▼	▼	▼	▼	▼
NT	474	9.0	▼	▼	▼	▼	▼	▼	▼	▼

		Country/ economy	Norway	New Zealand	Germany	Macao (China)	Poland	Slovenia	Netherlands	Sweden
		Avg. score	513	509	509	509	506	505	503	500
Jurisdiction	Avg. score	SE	2.5	2.4	3.0	1.3	2.5	1.5	2.4	3.5
ACT	516	4.5	●	●	●	●	●	▲	▲	▲
WA	507	4.2	●	●	●	●	●	●	●	●
VIC	507	3.7	●	●	●	●	●	●	●	●
SA	503	3.8	▼	●	●	●	●	●	●	●
NSW	502	3.0	▼	●	●	●	●	●	●	●
QLD	500	3.7	▼	▼	●	▼	●	●	●	●
TAS	476	4.4	▼	▼	▼	▼	▼	▼	▼	▼
NT	474	9.0	▼	▼	▼	▼	▼	▼	▼	▼

		Country/ economy	Denmark	France	Belgium	Portugal	United Kingdom	Chinese Taipei	United States	Spain
		Avg. score	500	499	499	498	498	497	497	496
Jurisdiction	Avg. score	SE	2.5	2.5	2.4	2.7	2.8	2.5	3.4	2.4
ACT	516	4.5	▲	▲	▲	▲	▲	▲	▲	▲
WA	507	4.2	●	●	●	●	●	▲	●	▲
VIC	507	3.7	●	●	●	●	●	▲	●	▲
SA	503	3.8	●	●	●	●	●	●	●	●
NSW	502	3.0	●	●	●	●	●	●	●	●
QLD	500	3.7	●	●	●	●	●	●	●	●
TAS	476	4.4	▼	▼	▼	▼	▼	▼	▼	▼
NT	474	9.0	▼	▼	▼	▼	▼	▼	▼	▼

		Country/ economy	Russian Federation	B-S-J-G (China)	OECD average	Switzerland	Latvia	Czech Republic	Croatia	Vietnam
		Avg. score	495	494	493	492	488	487	487	487
Jurisdiction	Avg. score	SE	3.1	5.1	0.5	3.0	1.8	2.6	2.7	3.7
ACT	516	4.5	▲	▲	▲	▲	▲	▲	▲	▲
WA	507	4.2	▲	●	▲	▲	▲	▲	▲	▲
VIC	507	3.7	▲	▲	▲	▲	▲	▲	▲	▲
SA	503	3.8	●	●	▲	▲	▲	▲	▲	▲
NSW	502	3.0	●	●	▲	▲	▲	▲	▲	▲
QLD	500	3.7	●	●	▲	●	▲	▲	▲	▲
TAS	476	4.4	▼	▼	▼	▼	▼	▼	▼	●
NT	474	9.0	▼	●	▼	●	●	●	●	●

		Country/ economy	Austria	Italy	Iceland	Luxembourg	Israel	Lithuania	Hungary	Greece
		Avg. score	485	485	482	481	479	472	470	467
Jurisdiction	Avg. score	SE	2.8	2.7	2.0	1.4	3.8	2.7	2.7	4.3
ACT	516	4.5	▲	▲	▲	▲	▲	▲	▲	▲
WA	507	4.2	▲	▲	▲	▲	▲	▲	▲	▲
VIC	507	3.7	▲	▲	▲	▲	▲	▲	▲	▲
SA	503	3.8	▲	▲	▲	▲	▲	▲	▲	▲
NSW	502	3.0	▲	▲	▲	▲	▲	▲	▲	▲
QLD	500	3.7	▲	▲	▲	▲	▲	▲	▲	▲
TAS	476	4.4	●	●	●	●	●	●	●	●
NT	474	9.0	●	●	●	●	●	●	●	●

		Country/ economy	Chile	Slovak Republic	Malta	Cyprus	Uruguay	Romania	United Arab Emirates	Bulgaria
		Avg. score	459	453	447	443	437	434	434	432
Jurisdiction	Avg. score	SE	2.6	2.8	1.8	1.7	2.5	4.1	2.9	5.0
ACT	516	4.5	▲	▲	▲	▲	▲	▲	▲	▲
WA	507	4.2	▲	▲	▲	▲	▲	▲	▲	▲
VIC	507	3.7	▲	▲	▲	▲	▲	▲	▲	▲
SA	503	3.8	▲	▲	▲	▲	▲	▲	▲	▲
NSW	502	3.0	▲	▲	▲	▲	▲	▲	▲	▲
QLD	500	3.7	▲	▲	▲	▲	▲	▲	▲	▲
TAS	476	4.4	▲	▲	▲	▲	▲	▲	▲	▲
NT	474	9.0	●	▲	▲	▲	▲	▲	▲	▲

		Country/ economy	Turkey	Costa Rica	Trinidad and Tobago	Montenegro	Colombia	Mexico
		Avg. score	428	427	427	427	425	423
Jurisdiction	Avg. score	SE	4.0	2.6	1.5	1.6	2.9	2.6
ACT	516	4.5	▲	▲	▲	▲	▲	▲
WA	507	4.2	▲	▲	▲	▲	▲	▲
VIC	507	3.7	▲	▲	▲	▲	▲	▲
SA	503	3.8	▲	▲	▲	▲	▲	▲
NSW	502	3.0	▲	▲	▲	▲	▲	▲
QLD	500	3.7	▲	▲	▲	▲	▲	▲
TAS	476	4.4	▲	▲	▲	▲	▲	▲
NT	474	9.0	▲	▲	▲	▲	▲	▲

Note: Read across the row to compare a jurisdiction's performance with the performance of each country/economy listed in the column heading.

- ▲ Average performance statistically significantly higher than in comparison country/economy
- No statistically significant difference from comparison country/economy
- ▼ Average performance statistically significantly lower than in comparison country/economy

Appendix C

These comparisons show that:

- ▶ the Australian Capital Territory performed significantly lower than 10 countries and not significantly different to 11 countries
- ▶ Western Australia performed significantly lower than 10 countries and not significantly different to 12 countries
- ▶ Victoria performed significantly lower than 15 countries and not significantly different to 13 countries
- ▶ New South Wales performed significantly lower than 19 countries and not significantly different to 12 countries
- ▶ South Australia performed significantly lower than 19 countries and not significantly different to 15 countries
- ▶ Queensland performed significantly lower than 21 countries and not significantly different to 13 countries
- ▶ the Northern Territory performed significantly lower than 25 countries and not significantly different to 16 countries
- ▶ Tasmania performed significantly lower than 36 countries and not significantly different to 5 countries.

TABLE C Mathematical literacy multiple comparison table for the Australian jurisdictions and PISA 2015 countries/economies

		Country/economy	Singapore	Hong Kong (China)	Macao (China)	Chinese Taipei	Japan	B-S-J-G (China)	Korea	Switzerland
		Avg. score	564	548	544	542	532	531	524	521
Jurisdiction	Avg. score	SE	1.5	3.0	1.1	3.0	3.0	4.9	3.7	2.9
ACT	505	3.6	▼	▼	▼	▼	▼	▼	▼	▼
WA	504	3.9	▼	▼	▼	▼	▼	▼	▼	▼
VIC	499	3.1	▼	▼	▼	▼	▼	▼	▼	▼
NSW	494	3.0	▼	▼	▼	▼	▼	▼	▼	▼
SA	489	4.2	▼	▼	▼	▼	▼	▼	▼	▼
QLD	486	3.3	▼	▼	▼	▼	▼	▼	▼	▼
NT	478	6.9	▼	▼	▼	▼	▼	▼	▼	▼
TAS	469	4.1	▼	▼	▼	▼	▼	▼	▼	▼

		Country/economy	Estonia	Canada	Netherlands	Denmark	Finland	Slovenia	Belgium	Germany
		Avg. score	520	516	512	511	511	510	507	506
Jurisdiction	Avg. score	SE	2.0	2.3	2.2	2.2	2.3	1.3	2.4	2.9
ACT	505	3.6	▼	▼	●	●	●	●	●	●
WA	504	3.9	▼	▼	●	●	●	●	●	●
VIC	499	3.1	▼	▼	▼	▼	▼	▼	▼	●
NSW	494	3.0	▼	▼	▼	▼	▼	▼	▼	▼
SA	489	4.2	▼	▼	▼	▼	▼	▼	▼	▼
QLD	486	3.3	▼	▼	▼	▼	▼	▼	▼	▼
NT	478	6.9	▼	▼	▼	▼	▼	▼	▼	▼
TAS	469	4.1	▼	▼	▼	▼	▼	▼	▼	▼

		Country/economy	Poland	Ireland	Norway	Austria	New Zealand	Vietnam	Russian Federation	Sweden
		Avg. score	504	504	502	497	495	495	494	494
Jurisdiction	Avg. score	SE	2.4	2.1	2.2	2.9	2.3	4.5	3.1	3.2
ACT	505	3.6	●	●	●	●	▲	●	▲	▲
WA	504	3.9	●	●	●	●	●	●	▲	▲
VIC	499	3.1	●	●	●	●	●	●	●	●
NSW	494	3.0	▼	▼	▼	●	●	●	●	●
SA	489	4.2	▼	▼	▼	●	●	●	●	●
QLD	486	3.3	▼	▼	▼	▼	▼	●	●	●
NT	478	6.9	▼	▼	▼	▼	▼	▼	▼	▼
TAS	469	4.1	▼	▼	▼	▼	▼	▼	▼	▼

		Country/economy	France	United Kingdom	Czech Republic	Portugal	OECD average	Italy	Iceland	Spain
		Avg. score	493	492	492	492	490	490	488	486
Jurisdiction	Avg. score	SE	2.1	2.5	2.4	2.5	0.4	2.8	2.0	2.2
ACT	505	3.6	▲	▲	▲	▲	▲	▲	▲	▲
WA	504	3.9	▲	▲	▲	▲	▲	▲	▲	▲
VIC	499	3.1	●	●	●	●	▲	▲	▲	▲
NSW	494	3.0	●	●	●	●	●	●	●	▲
SA	489	4.2	●	●	●	●	●	●	●	●
QLD	486	3.3	●	●	●	●	●	●	●	●
NT	478	6.9	▼	●	●	●	●	●	●	●
TAS	469	4.1	▼	▼	▼	▼	▼	▼	▼	▼

		Country/ economy	Luxembourg	Latvia	Malta	Lithuania	Hungary	Slovak Republic	Israel	United States
		Avg. score	486	482	479	478	477	475	470	470
Jurisdiction	Avg. score	SE	1.3	1.9	1.7	2.3	2.5	2.7	3.6	3.2
ACT	505	3.6	▲	▲	▲	▲	▲	▲	▲	▲
WA	504	3.9	▲	▲	▲	▲	▲	▲	▲	▲
VIC	499	3.1	▲	▲	▲	▲	▲	▲	▲	▲
NSW	494	3.0	▲	▲	▲	▲	▲	▲	▲	▲
SA	489	4.2	●	●	▲	▲	▲	▲	▲	▲
QLD	486	3.3	●	●	▲	▲	▲	▲	▲	▲
NT	478	6.9	●	●	●	●	●	●	●	●
TAS	469	4.1	▼	▼	▼	▼	●	●	●	●

		Country/ economy	Croatia	Greece	Romania	Bulgaria	Cyprus	United Arab Emirates	Chile	Turkey
		Avg. score	464	454	444	441	437	427	423	420
Jurisdiction	Avg. score	SE	2.8	3.8	3.8	4.0	1.7	2.4	2.5	4.1
ACT	505	3.6	▲	▲	▲	▲	▲	▲	▲	▲
WA	504	3.9	▲	▲	▲	▲	▲	▲	▲	▲
VIC	499	3.1	▲	▲	▲	▲	▲	▲	▲	▲
NSW	494	3.0	▲	▲	▲	▲	▲	▲	▲	▲
SA	489	4.2	▲	▲	▲	▲	▲	▲	▲	▲
QLD	486	3.3	▲	▲	▲	▲	▲	▲	▲	▲
NT	478	6.9	●	▲	▲	▲	▲	▲	▲	▲
TAS	469	4.1	●	▲	▲	▲	▲	▲	▲	▲

		Country/ economy	Moldova	Uruguay	Montenegro	Trinidad and Tobago	Thailand	Albania	Mexico
		Avg. score	420	418	418	417	415	413	408
Jurisdiction	Avg. score	SE	2.5	2.5	1.5	1.4	3.0	3.4	2.2
ACT	505	3.6	▲	▲	▲	▲	▲	▲	▲
WA	504	3.9	▲	▲	▲	▲	▲	▲	▲
VIC	499	3.1	▲	▲	▲	▲	▲	▲	▲
NSW	494	3.0	▲	▲	▲	▲	▲	▲	▲
SA	489	4.2	▲	▲	▲	▲	▲	▲	▲
QLD	486	3.3	▲	▲	▲	▲	▲	▲	▲
NT	478	6.9	▲	▲	▲	▲	▲	▲	▲
TAS	469	4.1	▲	▲	▲	▲	▲	▲	▲

Note: Read across the row to compare a jurisdiction's performance with the performance of each country/economy listed in the column heading.

- ▲ Average performance statistically significantly higher than in comparison country/economy
- No statistically significant difference from comparison country/economy
- ▼ Average performance statistically significantly lower than in comparison country/economy

References



- Australian Bureau of Statistics (ABS). (2011). *Census of population and housing: Socio-economic indexes for areas: SEIFA 2011* (cat. no. 2039.0). Canberra: Author.
- Australian Curriculum, Assessment and Reporting Authority (ACARA). (2015). *Measurement framework for schooling in Australia*. Sydney: Education Council and ACARA.
- Jones, R. (2004). *Geolocation questions and coding index*. Canberra: Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA).
- Organisation for Economic Co-operation and Development (OECD). (2016). *PISA 2015 assessment and analytical framework: Science, reading, mathematics and financial literacy*. Paris: Author.
- Organisation for Economic Co-operation and Development (OECD). (forthcoming). *PISA 2015 technical report*. Paris: Author.



www.acer.edu.au/ozpisa