

The Performance of Students in the Australian Capital Territory on PISA

Report to the ACT Department of Education and Training

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Introduction

This report was prepared by the Australian Council for Educational Research on behalf of the ACT Department of Education and Training.

The purpose of this report is to examine the performance of ACT students in the Programme for International Student Assessment (PISA) over the three cycles: Reading literacy in 2000, Mathematical literacy in 2003 and Scientific literacy in 2006. The report provides an opportunity to examine achievement within the territory, in comparison to the rest of the country and internationally.

Key Findings

- There has been a significant decline in the reading literacy performance of students in the ACT from PISA 2000 to PISA 2006. This mirrors a similar decline in reading literacy for Australia as a whole. The decline was found at the higher ends of the achievement scale; at the 75th, 90th and 95th percentiles. These results show that the best performers in reading literacy in the ACT are not performing as well in PISA 2006 as they did in PISA 2000. This is the same finding as for Australia nationally. At the lower ends of spectrum of achievement there were no significant differences found between PISA 2000, 2003 and 2006.
- There was no statistically significant difference in mathematical literacy performance between PISA 2003 and PISA 2006 for either the ACT or Australia. There was a significant decline in the mathematical literacy performance of students in both the ACT and Australia at the 90th and 95th percentile¹.
- In each literacy domain, the average achievement scores of students in the ACT is the highest in Australia. In scientific literacy, the average score for the ACT was statistically the same as that of WA and SA in 2000, and statistically the same as that of WA in 2003 and 2006. In reading literacy, the average score for the ACT was statistically the same as that of NSW, WA and SA in 2000, and statistically the same as that of WA in 2003 and 2006. In mathematical literacy, the average score for the ACT was statistically the same as that of WA, NSW and VIC in 2000, and that of WA in 2003 and 2006.
- In scientific literacy, 11 per cent of ACT students were not achieving at the OECD defined baseline proficiency level 2 in PISA 2006. This compares favourably with the Australian average of 13 per cent and the OECD average of 19 per cent. Twenty-one per cent of ACT students, compared to 15 per cent of Australian students and an OECD average of 9 per cent, achieved at the highest two proficiency levels.

¹ The scores for scientific literacy cannot be compared between cycles as 2006 was the first full assessment of scientific literacy.

- Proficiency levels in reading literacy have barely changed over the three cycles of PISA, either for the ACT or for Australia overall. In PISA 2006 10 per cent of ACT students, compared to 14 per cent of Australian students and 20 per cent of OECD students, did not achieve proficiency level 2. At the higher levels of achievement, 46 per cent of ACT students, compared to 36 per cent of Australian students and 29 per cent over the OECD, achieved at least proficiency level 4 (of 5).
- In mathematical literacy there were also no changes between PISA 2003 and PISA 2006. In PISA 2006 10 per cent of ACT students, compared to 13 per cent nationally and an OECD average of 22 per cent, did not reach proficiency level 2. In contrast, 23 per cent of ACT students, 16 per cent of Australian students and 13 per cent of students in the OECD, performed at the highest two proficiency levels.
- Around 70 per cent of ACT students performed at a level higher than the OECD average in each of the three literacies. The average for Australia overall for each is around 62 per cent.
- There were no changes in the percentage of students achieving either above or below the OECD average between PISA cycles in scientific literacy for either the ACT or Australia overall.
- There were no significant differences found between the percentage of ACT students above or below the OECD average for reading literacy, contrasting to a significant increase of 4 per cent of Australian students performing below the OECD average.
- There were no significant differences found between the percentage of ACT students above or below the OECD average for mathematical literacy, contrasting to a significant increase of 6 per cent of Australian students performing below the OECD average.
- The distribution of socioeconomic levels in the ACT is narrower than that of other states: the lower and higher socioeconomic levels are higher for the ACT than for all other states.
- There is no significant difference between the percentage of students in the lowest socioeconomic quartile performing at or above the OECD average in any of the three literacies in the ACT and Australia.
- A slightly higher percentage of ACT students than Australian students in the highest socioeconomic quartile achieved at or above the OECD average in each of the literacies.
- The socioeconomic gradients for each of the three literacy domains show that the ACT has higher levels of achievement than any of the other states over all levels of socioeconomic background. At the lowest level of achievement the score is similar to that of a few of the other states, however as socioeconomic levels increase, the gap between the performance of students in the ACT and Australia increases. In all

literacies assessed, at all socioeconomic levels, students in the ACT performed at a higher level than students in other states.

1. Means and percentiles in the literacy domains over the three PISA cycles

Confidence intervals and standard errors

In this and other PISA reports, student achievement is often described by a mean score. For PISA, each mean score is calculated from the sample of students who undertook the PISA assessment, and is referred to as the *sample* mean. These sample means are an approximation of the actual mean score, known as the population mean, which would have been derived had *all* students in Australia actually sat the PISA assessment. Since the sample mean is just one point along the range of student achievement scores, more information is needed to gauge whether the sample mean is an underestimation or overestimation of the population mean. The calculation of confidence intervals can assist our assessment of a sample mean's precision as a population mean. Confidence intervals provide a range of scores within which we are 'confident' that the population mean actually lies. In this report, sample means are presented with an associated standard error. The confidence interval which can be calculated using the standard error indicates that there is a 95 per cent chance that the actual population mean lies within plus or minus 1.96 standard errors of the sample mean.

Tables 1.1-1.6 and Tables 1.9-1.11 on the following pages provide the means and percentiles in scientific, reading and mathematical literacy for each of the PISA cycles for the ACT, Australia, the highest scoring country in each domain in each cycle, and the OECD average. Also provided in Tables 1.7, 1.8 and 1.12 are the adjusted differences between the means for the percentiles for reading and mathematical literacy between appropriate cycles, along with a measure of the significance of the difference.

Significance testing can be carried out for changes in reading literacy between PISA 2000, PISA 2003 and PISA 2006, as PISA 2000 was a full assessment of reading literacy. Similarly, testing can be carried out for the changes in significance for mathematical literacy between PISA 2003 and PISA 2006 as PISA 2003 was a full assessment of mathematical literacy. PISA 2006 was the first full assessment of scientific literacy and so no comparisons can be made with the assessment in previous cycles.

Means and percentiles in scientific literacy

Table 1.1 Mean and percentiles in scientific literacy for PISA 2000

State	Mean	SE	5th percentile		10th percentile		25th percentile		75th percentile		90th percentile		95th percentile	
			Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
ACT	553	5.9	377	16.4	428	15.1	489	9.8	621	7.0	675	15.1	705	16.1
Australia	528	3.5	368	5.1	402	4.7	463	4.6	596	4.8	646	5.1	675	4.8
Korea	552	2.7	411	5.3	442	5.3	499	4.0	610	3.4	652	3.9	674	5.7
OECD average	500	0.7	332	1.5	368	1.0	431	1.0	572	0.8	627	0.8	657	1.2

Table 1.2 Mean and percentiles in scientific literacy for PISA 2003

State	Mean	SE	5th percentile		10th percentile		25th percentile		75th percentile		90th percentile		95th percentile	
			Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
ACT	553	4.7	372	12.8	416	10.3	488	7.7	624	6.3	680	6.9	714	9.8
Australia	525	2.1	351	4.2	391	3.4	457	3.1	596	2.7	652	2.9	686	3.7
Finland	548	1.9	393	3.5	429	2.6	488	2.8	611	2.2	662	2.9	691	3.5
OECD average	500	0.6	324	1.2	362	1.1	427	1.0	575	0.8	634	0.9	668	1.0

Table 1.3 Mean and percentiles in scientific literacy for PISA 2006

State	Mean	SE	5th percentile		10th percentile		25th percentile		75th percentile		90th percentile		95th percentile	
			Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
ACT	549	4.9	366	12.4	408	9.5	483	7.8	623	6.1	673	7.7	703	10.8
Australia	527	2.3	358	3.5	395	3.4	459	2.6	598	2.5	653	2.9	685	3.4
Finland	563	2.0	419	4.4	453	3.3	506	2.9	622	2.5	673	2.9	700	3.1
OECD average	500	0.5	340	1.0	375	0.9	434	0.7	568	0.6	622	0.7	652	0.8

NB. Trend comparisons can not be completed with scientific literacy as PISA 2006 was the first full implementation of the science assessment.

Means and percentiles in reading literacy

Table 1.4 Means and percentiles in reading literacy for PISA 2000

State	Mean	SE	5th percentile		10th percentile		25th percentile		75th percentile		90th percentile		95th percentile	
			Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
ACT	552	4.6	381	9.8	426	9.8	488	8.2	625	6.0	676	8.7	706	13.4
Australia	528	3.5	354	4.8	394	4.4	458	4.4	602	4.6	656	4.2	685	4.5
Finland	546	2.6	390	5.8	429	5.1	492	2.9	608	2.6	654	2.8	681	3.4
OECD average	500	0.6	324	1.3	366	1.1	435	1.0	571	0.7	623	0.8	652	0.8

Table 1.5 Means and percentiles in reading literacy for PISA 2003

State	Mean	SE	5th percentile		10th percentile		25th percentile		75th percentile		90th percentile		95th percentile	
			Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
ACT	549	6.0	374	14.0	421	10.1	492	7.0	616	7.9	662	7.0	691	7.8
Australia	525	2.1	352	4.8	395	3.6	464	3.0	594	2.5	644	2.7	673	3.1
Finland	544	1.6	400	4.8	437	3.1	494	2.4	599	1.7	641	2.2	666	2.5
OECD average	494	0.6	318	1.4	361	1.3	430	1.0	565	0.6	617	0.6	646	0.7

Table 1.6 Means and percentiles in reading literacy for PISA 2006

State	Mean	SE	5th percentile		10th percentile		25th percentile		75th percentile		90th percentile		95th percentile	
			Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
ACT	535	5.0	366	12.7	410	9.7	479	6.8	601	5.4	647	6.3	670	7.3
Australia	513	2.1	349	3.4	388	3.4	453	2.4	579	2.3	628	2.9	656	2.6
Korea	556	3.8	399	9.7	440	7.9	503	4.8	617	3.4	663	4.3	688	5.0
OECD average	492	0.6	317	1.4	360	1.1	429	0.8	562	0.6	613	0.7	642	0.8

Table 1.7 shows the differences in percentiles between PISA cycles for reading literacy in Australia.

- There have been significant declines in the reading literacy performance of students in the 75th, 90th and 95th percentiles between PISA 2003 and PISA 2006, and between PISA 2000 and PISA 2006; ie. the best performers in reading literacy are not performing as well in PISA 2006 as they did in PISA 2000 and PISA 2003.

Table 1.7 Differences in percentiles between PISA 2000, PISA 2003 and PISA 2006 for Australia in reading literacy

PISA	5th percentile		10th percentile		25th percentile		75th percentile		90th percentile		95th percentile	
	Diff.	SE	Diff.	SE	Diff.	SE	Diff.	SE	Diff.	SE	Diff.	SE
2000 and 2003	-2	8.7	1	7.8	6	7.5	-8	7.5	-12	7.3	-13	7.6
2003 and 2006	-3	7.4	-6	6.7	-11	5.9	-15	5.6	-16	6.0	-17	6.0
2000 and 2006	-5	7.7	-6	7.4	-5	7.1	-23	7.2	-27	7.1	-29	7.2

Note: Differences in bold are statistically significant

Table 1.8 shows the differences in percentiles between PISA cycles for reading literacy in the ACT.

- There have been significant declines in the reading literacy performance of students in the ACT in the 75th, 90th and 95th percentiles between PISA 2000 and PISA 2006. There was a 23 score point decline in the 75th percentile, 29 points in the 90th percentile and 37 score points in the 95th percentile. These results show the best performers in reading literacy from the ACT are not performing as well in PISA 2006 as they did in PISA 2000.

Table 1.8 Differences in percentiles between PISA 2000, PISA 2003 and PISA 2006 for the ACT in reading literacy

PISA	5th percentile		10th percentile		25th percentile		75th percentile		90th percentile		95th percentile	
	Diff.	SE	Diff.	SE	Diff.	SE	Diff.	SE	Diff.	SE	Diff.	SE
2000 and 2003	-7	17.9	-5	15.0	4	12.0	-8	11.3	-13	12.4	-15	16.4
2003 and 2006	-7	19.4	-11	14.7	-13	10.7	-15	10.6	-16	10.4	-22	11.6
2000 and 2006	-14	16.8	-16	14.6	-9	11.8	-23	9.5	-29	11.9	-37	8.8

Note: Differences in bold are statistically significant

Means and percentiles in mathematical literacy

Table 1.9 Means and percentiles in mathematical literacy for PISA 2000

State	Mean	SE	5th percentile		10th percentile		25th percentile		75th percentile		90th percentile		95th percentile	
			Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
ACT	548	6.2	407	23.8	438	15.4	487	8.7	614	13.1	670	12.4	697	13.4
Australia	533	3.5	380	6.4	418	6.4	474	4.4	594	4.5	647	5.7	679	5.8
Japan	557	5.5	402	11.2	440	9.1	504	7.4	617	5.2	662	4.9	688	6.1
OECD average	500	0.7	326	1.5	367	1.4	435	1.1	571	0.8	625	0.9	655	1.1

Table 1.10 Means and percentiles in mathematical literacy for PISA 2003

State	Mean	SE	5th percentile		10th percentile		25th percentile		75th percentile		90th percentile		95th percentile	
			Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
ACT	548	3.5	382	6.2	416	7.2	487	6.9	612	5.2	670	6.5	699	7.0
Australia	524	2.1	364	4.4	399	3.4	460	2.8	592	2.5	645	3.0	676	3.5
Hong Kong-China	550	4.5	374	11.1	417	8.0	485	6.9	622	3.7	672	4.1	700	7.4
OECD average	500	0.6	332	1.3	369	1.1	432	0.9	571	0.7	628	0.7	660	1.0

Table 1.11 Means and percentiles in mathematical literacy for PISA 2006

State	Mean	SE	5th percentile		10th percentile		25th percentile		75th percentile		90th percentile		95th percentile	
			Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
ACT	539	5.6	384	14.6	421	11.2	479	8.9	602	6.5	648	5.9	675	7.4
Australia	520	2.2	375	3.2	406	2.7	460	2.3	581	2.5	633	3.3	663	4.0
Chinese Taipei	549	4.1	373	7.2	409	6.2	477	6.1	625	3.3	677	3.4	707	3.9
OECD average	498	0.5	346	1.1	379	0.9	436	0.7	561	0.6	615	0.8	645	0.9

Table 1.12 shows the differences in percentiles between PISA 2003 and PISA 2006 for mathematical literacy in the ACT and for Australia.

- In the ACT, there have been significant declines in the mathematical literacy performance of students in the 90th and 95th percentiles between PISA 2003 and PISA 2006.
- There was a decline of 23 score point for ACT students in the 90th percentile and a decline of 24 score points for ACT students in the 95th percentile.
- For Australia as a whole, there have been significant declines in the mathematical literacy performance of students in the 75th, 90th and 95th percentiles between PISA 2003 and PISA 2006.
- There was a decline of 11 score points between PISA 2003 and PISA 2006 in the 75th percentile for Australian students, and in the 90th and 95th percentile, a 12 score point decrease in the mean from PISA 2003 to PISA 2006.

Table 1.12 Differences in percentiles between PISA 2000, PISA 2003 and PISA 2006 for the ACT and Australia in mathematical literacy

PISA 2003 and PISA 2006	5th percentile		10th percentile		25th percentile		75th percentile		90th percentile		95th percentile	
	Diff.	SE	Diff.	SE	Diff.	SE	Diff.	SE	Diff.	SE	Diff.	SE
ACT	2	16.0	5	13	-8	11	-10	8.4	-23	8.9	-24	10
Australia	11	5.7	8	4.6	0	3.8	-11	3.8	-12	4.7	-12	5.5

Note: Differences in bold are statistically significant

2. Mean scores in the literacy domains and changes over time

Scientific literacy

Figures 2.1, 2.2 and 2.3 show the state-level performance in scientific literacy by indicating significant differences in achievement between the states for PISA 2000, PISA 2003 and PISA 2006.

How to read the multiple comparison figures

Note: Read **across** the row to compare a state's performance with the performance of each state listed in the column heading.

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

Note: Bonferroni correction has not been applied²

Figure 2.1 Multiple comparisons of mean performance in scientific literacy by state for PISA 2000

	State Mean	SE	ACT	WA	SA	NSW	QLD	VIC	TAS	NT	OECD
	553	5.9	553	544	539	532	523	516	510	490	500
			5.9	7.7	9.2	6.9	6.7	8.1	9.3	7.6	0.7
ACT	553	5.9		●	●	▲	▲	▲	▲	▲	▲
WA	544	7.7	●		●	●	▲	▲	▲	▲	▲
SA	539	9.2	●	●		●	●	●	▲	▲	▲
NSW	532	6.9	▼	●	●		●	●	●	▲	▲
QLD	523	6.7	▼	▼	●	●		●	●	▲	▲
VIC	516	8.1	▼	▼	●	●	●		●	▲	●
TAS	510	9.3	▼	▼	▼	●	●	●		●	●
NT	490	7.6	▼	▼	▼	▼	▼	▼	●		●

- In PISA 2000, the ACT performed similarly to WA and SA, and performed significantly higher than all other Australian states as well as the OECD average in scientific literacy.

² In PISA 2000 the Bonferroni correction was applied to the multiple comparisons, in PISA 2003 the results were presented with and without the Bonferroni correction and in PISA 2006 the results were presented without the Bonferroni correction. To maintain comparability in this present report, the Bonferroni correction has not been applied to any data.

- In PISA 2003 and PISA 2006, the ACT performed on a par with WA and performed significantly higher than all other Australian states in scientific literacy. The ACT performed significantly higher than the OECD average.

Figure 2.2 Multiple comparisons of mean performance in scientific literacy by state for PISA 2003

		State Mean	SE	ACT	WA	SA	NSW	QLD	VIC	TAS	NT	OECD
		553	4.7	553	546	535	530	519	510	509	495	500
		4.7	4.3	4.3	4.4	6.6	5.2	9.5	5.8	0.6		
State	Mean	SE										
ACT	553	4.7		●	▲	▲	▲	▲	▲	▲	▲	▲
WA	546	4.3	●		●	▲	▲	▲	▲	▲	▲	▲
SA	535	4.3	▼	●		●	▲	▲	▲	▲	▲	▲
NSW	530	4.4	▼	▼	●		●	▲	▲	▲	▲	▲
QLD	519	6.6	▼	▼	▼	●		●	●	▲	▲	▲
VIC	510	5.2	▼	▼	▼	▼	●		●	▲	▲	▲
TAS	509	9.5	▼	▼	▼	▼	▼	●		●	●	●
NT	495	5.8	▼	▼	▼	▼	▼	▼	▼	●		●

Figure 2.3 Multiple comparisons of mean performance in scientific literacy by state for PISA 2006

		State Mean	SE	ACT	WA	NSW	SA	QLD	VIC	TAS	NT	OECD
		549	543	535	532	522	513	507	490	500		
		4.9	6.8	4.6	4.9	4.2	4.9	4.6	6.6	(0.5)		
State	Mean	SE										
ACT	549	4.9		●	▲	▲	▲	▲	▲	▲	▲	▲
WA	543	6.8	●		●	●	▲	▲	▲	▲	▲	▲
NSW	535	4.6	▼	●		●	▲	▲	▲	▲	▲	▲
SA	532	4.9	▼	●	●		●	▲	▲	▲	▲	▲
QLD	522	4.2	▼	▼	▼	●		●	▲	▲	▲	▲
VIC	513	4.9	▼	▼	▼	▼	▼	●		▲	▲	▲
TAS	507	4.6	▼	▼	▼	▼	▼	▼	●		▲	●
NT	490	6.6	▼	▼	▼	▼	▼	▼	▼	▼		●

Reading literacy

- Table 2.4 shows the mean and standard errors in reading literacy for PISA 2000, PISA 2003 and PISA 2006, as well as the differences in reading literacy performance between cycles.
- The overall reading literacy mean for the ACT declined significantly between PISA 2000 and PISA 2006 by 17 score points.
- The overall reading literacy mean for Australia declined significantly between PISA 2003 and PISA 2006 by 13 score points, and between PISA 2000 and PISA 2006 there was a 15 score point decline in the mean.

Table 2.4 Mean and standard errors for PISA 2000, PISA 2003 and PISA 2006, and differences between reading literacy performance

State	PISA 2000		PISA 2003		PISA 2006		Differences between					
	Mean	S.E.	Mean	S.E.	Mean	S.E.	PISA 2000 and PISA 2003		PISA 2003 and PISA 2006		PISA 2000 and PISA 2006	
							Diff.	S.E.	Diff.	S.E.	Diff.	S.E.
ACT	552	4.6	549	6.0	535	5.0	-3	9.2	-14	9.0	-17	8.4
Australia	528	3.5	525	2.1	513	2.1	-3	6.7	-13	5.4	-15	6.4

Note: Differences in bold are statistically significant

Table 2.5 shows the mean and standard errors in reading literacy for females across PISA 2000, PISA 2003 and PISA 2006, as well as the differences in reading literacy performance between cycles for females.

- There were no statistically significant differences in reading literacy performance between PISA cycles for ACT females.
- There was a significant decline in reading literacy performance for Australian females between PISA 2003 and PISA 2006, and between PISA 2000 and PISA 2006, each with a difference of 14 score points.

Table 2.5 Mean and standard errors for PISA 2000, PISA 2003 and PISA 2006, and differences between reading literacy performance for females

State	PISA 2000		PISA 2003		PISA 2006		Differences between					
							PISA 2000 and PISA 2003		PISA 2003 and PISA 2006		PISA 2000 and PISA 2006	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Diff.	S.E.	Diff.	S.E.	Diff.	S.E.
ACT	565	10.1	569	12.2	549	6.1	4	16.7	-20	14.4	-16	12.8
Australia	546	4.7	545	2.6	532	2.2	-1	7.6	-14	5.6	-14	7.2

Note: Differences in bold are statistically significant

- Table 2.6 shows the mean and standard errors in reading literacy for males across PISA 2000, PISA 2003 and PISA 2006, as well as the differences in reading literacy performance between cycles for males.
- There were no statistically significant differences in reading literacy performance between PISA cycles for ACT males.
- There was a significant decline of 18 score points in reading literacy performance for Australian males between PISA 2000 and PISA 2006.

Table 2.6 Mean and standard errors for PISA 2000, PISA 2003 and PISA 2006, and differences between reading literacy performance for males

State	PISA 2000		PISA 2003		PISA 2006		Differences between					
							PISA 2000 and PISA 2003		PISA 2003 and PISA 2006		PISA 2000 and PISA 2006	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Diff.	S.E.	Diff.	S.E.	Diff.	S.E.
ACT	542	14	527	9.2	522	10.3	-15	17.6	-5	14.5	-20	18.1
Australia	513	4.0	506	2.8	495	3.0	-7	7.2	-11	6.1	-18	7.1

Note: Differences in bold are statistically significant

Multiple comparisons between the states in reading literacy

Figures 2.7, 2.8 and 2.9 show the state-level performance in reading literacy by indicating significant differences in achievement between the states for PISA 2000, PISA 2003 and PISA 2006.

- In PISA 2000, the ACT performed similarly to NSW, WA and SA, and performed significantly higher than QLD, VIC, TAS and the NT in reading literacy. The ACT also performed significantly higher than the OECD average.
- In PISA 2003 and PISA 2006, the ACT performed on a par with WA and performed significantly higher than all other Australian states in reading literacy. The ACT performed significantly higher than the OECD average.

Figure 2.7 Multiple comparisons of mean performance in reading literacy by state for PISA 2000

		State Mean SE	ACT	NSW	WA	SA	QLD	VIC	TAS	NT	OECD
			552 4.6	539 6.3	538 8.0	537 7.7	521 8.6	516 7.6	514 9.7	489 5.6	500 (0.6)
ACT	552	4.6	■	●	●	●	▲	▲	▲	▲	▲
NSW	539	6.3	●	■	●	●	●	▲	▲	▲	▲
WA	538	8.0	●	●	■	●	●	▲	●	▲	▲
SA	537	7.7	●	●	●	■	●	●	●	▲	▲
QLD	521	8.6	▼	●	●	●	■	●	●	▲	▲
VIC	516	7.6	▼	▼	▼	●	●	■	●	▲	▲
TAS	514	9.7	▼	▼	●	●	●	●	■	▲	●
NT	489	5.6	▼	▼	▼	▼	▼	▼	▼	■	▼

Figure 2.8 Multiple comparisons of mean performance in reading literacy by state for PISA 2003

		State Mean SE	ACT	WA	SA	NSW	QLD	VIC	TAS	NT	OECD
			549 6.0	546 4.3	532 4.3	530 4.3	517 8.1	514 5.0	508 7.2	496 6.1	494 0.6
ACT	549	6.0	■	●	▲	▲	▲	▲	▲	▲	▲
WA	546	4.3	●	■	▲	▲	▲	▲	▲	▲	▲
SA	532	4.3	▼	▼	■	●	●	▲	▲	▲	▲
NSW	530	4.3	▼	▼	●	■	●	▲	▲	▲	▲
QLD	517	8.1	▼	▼	●	●	■	●	●	▲	▲
VIC	514	5.0	▼	▼	▼	▼	●	■	●	▲	▲
TAS	508	7.2	▼	▼	▼	▼	●	●	■	●	●
NT	496	6.1	▼	▼	▼	▼	▼	▼	●	■	●

Figure 2.9 Multiple comparisons of mean performance in reading literacy by state for PISA 2006

		State Mean SE	ACT	WA	NSW	SA	QLD	VIC	TAS	NT	OECD
			535 5.0	524 6.0	519 4.4	514 4.9	509 3.5	504 4.3	496 4.6	460 10.6	492 (0.6)
ACT	535	5.0	■	●	▲	▲	▲	▲	▲	▲	▲
WA	524	6.0	●	■	●	●	▲	▲	▲	▲	▲
NSW	519	4.4	▼	●	■	●	●	▲	▲	▲	▲
SA	514	4.9	▼	●	●	■	●	●	▲	▲	▲
QLD	509	3.5	▼	▼	●	●	■	●	▲	▲	▲
VIC	504	4.3	▼	▼	▼	●	●	■	●	▲	▲
TAS	496	4.6	▼	▼	▼	▼	▼	●	■	▲	●
NT	460	10.6	▼	▼	▼	▼	▼	▼	▼	■	▼

Mathematical literacy

- Table 2.10 shows the mean and standard errors in mathematical literacy for PISA 2003 and PISA 2006, as well as the differences in mathematical literacy performance between cycles.
- There were no statistically significant differences in mathematical literacy performance between PISA 2003 and PISA 2006 cycles for the ACT or for Australia overall.

Table 2.10 Mean and standard errors for PISA 2003 and PISA 2006, and differences between mathematical literacy performance

State	PISA 2003		PISA 2006		Differences between PISA 2003 and PISA 2006	
	Mean	S.E.	Mean	S.E.	Diff.	S.E.
ACT	548	3.5	539	5.6	-9	6.7
Australia	524	2.1	520	2.2	-4	3.4

Note: Differences in bold are statistically significant

- Table 2.11 shows the mean and standard errors in mathematical literacy for females across PISA 2003 and PISA 2006, as well as the differences in mathematical literacy performance between cycles for females.
- There were no statistically significant differences in mathematical literacy performance between PISA cycles for ACT females.
- There was a significant decline (of nine score points) in mathematical literacy performance for Australian females between PISA 2003 and PISA 2006.

Table 2.11 Mean and standard errors for PISA 2003 and PISA 2006, and differences between mathematical literacy performance for females

State	PISA 2003		PISA 2006		Differences between PISA 2003 and PISA 2006	
	Mean	S.E.	Mean	S.E.	Diff.	S.E.
ACT	548	12.2	529	6.6	-19	14.0
Australia	522	2.7	513	2.4	-9	3.9

Note: Differences in bold are statistically significant

- Table 2.12 shows the mean and standard errors in mathematical literacy for males across PISA 2003 and PISA 2006, as well as the differences in mathematical literacy performance between cycles for males.
- There were no statistically significant differences in mathematical literacy performance between PISA 2003 and PISA 2006 cycles for ACT males or for Australia.

Table 2.12 Mean and standard errors for PISA 2003 and PISA 2006, and differences between mathematical literacy performance for males

State	PISA 2003		PISA 2006		Differences between PISA 2003 and PISA 2006	
	Mean	S.E.	Mean	S.E.	Diff.	S.E.
ACT	548	10.2	548	8.8	0	13.6
Australia	527	3.0	527	3.2	0	4.6

Note: Differences in bold are statistically significant

Multiple comparisons between the states in mathematical literacy

Figures 2.13, 2.14 and 2.15 show the state-level performance in mathematical literacy by indicating significant differences in achievement between the states for PISA 2000, PISA 2003 and PISA 2006.

- In PISA 2000, the ACT performed similarly to WA, NSW and VIC, and performed significantly higher than SA, QLD, TAS and the NT in mathematical literacy. The ACT also performed significantly higher than the OECD average.

- In PISA 2003 and PISA 2006, the ACT performed on a par with WA and performed significantly higher than all other Australian states in mathematical literacy. The ACT performed significantly higher than the OECD average.

Figure 2.13 Multiple comparisons of mean performance in mathematical literacy by state for PISA 2000

	State Mean	SE	ACT	WA	NSW	VIC	SA	QLD	TAS	NT	OECD
	548	6.2	548	547	540	529	526	525	517	502	500
			6.2	6.8	6.5	8.1	8.6	7.7	9.7	6.7	0.7
ACT	548	6.2		●	●	●	▲	▲	▲	▲	▲
WA	547	6.8	●		●	●	●	▲	▲	▲	▲
NSW	540	6.5	●	●		●	●	●	●	▲	▲
VIC	529	8.1	●	●	●		●	●	●	▲	▲
SA	526	8.6	▼	●	●	●		●	●	▲	▲
QLD	525	7.7	▼	▼	●	●	●		●	▲	▲
TAS	517	9.7	▼	▼	●	●	●	●		●	●
NT	502	6.7	▼	▼	▼	▼	▼	▼	●		●

Figure 2.14 Multiple comparisons of mean performance in mathematical literacy by state for PISA 2003

	State Mean	SE	WA	ACT	SA	NSW	QLD	VIC	TAS	NT	OECD
	548	4.1	548	548	535	526	520	511	507	496	500
			4.1	3.5	4.9	4.3	6.9	5.1	9.4	4.9	0.6
WA	548	4.1		●	▲	▲	▲	▲	▲	▲	▲
ACT	548	3.5	●		▲	▲	▲	▲	▲	▲	▲
SA	535	4.9	▼	▼		●	●	▲	▲	▲	▲
NSW	526	4.3	▼	▼	●		●	▲	●	▲	▲
QLD	520	6.9	▼	▼	●	●		●	●	▲	▲
VIC	511	5.1	▼	▼	▼	▼	●		●	▲	▲
TAS	507	9.4	▼	▼	▼	●	●	●		●	●
NT	496	4.9	▼	▼	▼	▼	▼	▼	●		●

Figure 2.15 Multiple comparisons of mean performance in mathematical literacy by state for PISA 2006

	State Mean	SE	ACT	WA	NSW	SA	QLD	VIC	TAS	NT	OECD
	539	5.6	539	531	523	520	519	513	502	481	498
			5.6	6.5	5.0	4.3	4.4	4.0	3.8	6.2	(0.5)
ACT	539	5.6		●	▲	▲	▲	▲	▲	▲	▲
WA	531	6.5	●		●	●	●	▲	▲	▲	▲
NSW	523	5.0	▼	●		●	●	●	▲	▲	▲
SA	520	4.3	▼	●	●		●	●	▲	▲	▲
QLD	519	4.4	▼	●	●	●		●	▲	▲	▲
VIC	513	4.0	▼	▼	●	●	●		▲	▲	▲
TAS	502	3.8	▼	▼	▼	▼	▼	▼		▲	●
NT	481	6.2	▼	▼	▼	▼	▼	▼	▼		▼

3. Proficiency levels

Scientific literacy

Table 3.1 provides the percentages of students at the defined proficiency levels for scientific literacy, for the ACT, Australia, the OECD average, and the highest-scoring country, Finland. As this was the first full assessment of scientific literacy it was the first time proficiency levels were described for this domain.

Table 3.1 Proficiency levels in scientific literacy for PISA 2006

State	Below Level 1		Level 1		Level 2		Level 3		Level 4		Level 5		Level 6	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
ACT	3	0.8	8	1.3	15	1.5	25	1.7	28	1.9	17	1.4	4	1.1
Australia	3	0.3	10	0.5	20	0.6	28	0.5	25	0.5	12	0.5	3	0.3
Finland	1	0.1	4	0.4	14	0.7	29	1.1	32	0.9	17	0.7	4	0.3
OECD average	5	0.1	14	0.1	24	0.2	27	0.2	20	0.2	8	0.1	1	0.0

Reading literacy

Tables 3.2, 3.3 and 3.4 provide the percentages of students at the defined proficiency levels for reading literacy, for the ACT, Australia, the OECD average, and the highest-scoring country in each cycle.

Table 3.2 Proficiency levels in reading literacy for PISA 2000

State	Below Level 1		Level 1		Level 2		Level 3		Level 4		Level 5	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
ACT	2	0.8	5	1.6	15	1.8	26	2.1	26	2.5	25	2.2
Finland	2	0.5	5	0.4	14	0.7	29	0.8	32	0.9	19	0.9
OECD Average	6	0.1	12	0.2	22	0.2	29	0.2	22	0.2	10	0.1
Australia	3	0.5	9	0.8	19	1.1	26	1.1	25	0.9	18	1.2

Table 3.3 Proficiency levels in reading literacy for PISA 2003

State	Below Level 1		Level 1		Level 2		Level 3		Level 4		Level 5	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
ACT	3	0.6	5	1.1	14	1.7	26	2.2	30	2.0	22	3.0
Australia	4	0.4	8	0.4	18	0.6	28	0.8	27	0.8	15	0.7
Finland	1	0.2	5	0.4	15	0.6	32	0.8	33	0.7	15	0.7
OECD average	7	0.1	12	0.2	23	0.2	29	0.2	21	0.2	8	0.1

Table 3.4 Proficiency levels in reading literacy for PISA 2006

State	Below Level 1		Level 1		Level 2		Level 3		Level 4		Level 5	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
ACT	3	0.9	7	1.1	16	1.2	29	2.1	30	1.8	16	1.8
Australia	4	0.3	10	0.5	21	0.7	30	0.6	25	0.7	11	0.6
Korea	1	0.3	4	0.7	13	0.8	27	1.1	33	1.3	22	1.4
OECD Average	7	0.1	13	0.1	23	0.2	28	0.2	21	0.2	9	0.1

Mathematical literacy

Tables 3.5 and 3.6 provide the percentages of students at the defined proficiency levels in mathematical literacy for PISA 2003 and PISA 2006, for the ACT, Australia, the OECD average, and the highest-scoring country in each cycle.

Table 3.5 Proficiency levels in mathematical literacy for PISA 2003

State	Below Level 1		Level 1		Level 2		Level 3		Level 4		Level 5		Level 6	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
ACT	3	0.7	8	1.2	13	1.5	22	2.1	26	1.8	17	2.2	10	1.6
Australia	4	0.4	10	0.5	19	0.6	24	0.7	23	0.6	14	0.5	6	0.4
Hong Kong-China	4	0.7	7	0.6	14	1.0	20	1.3	25	1.2	20	1.0	11	0.9
OECD Average	8	0.2	13	0.2	21	0.1	24	0.2	19	0.2	11	0.1	1	1.0

Table 3.6 Proficiency levels in mathematical literacy for PISA 2006

State	Below Level 1		Level 1		Level 2		Level 3		Level 4		Level 5		Level 6	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
ACT	3	1.0	7	1.4	16	1.6	24	2.2	26	1.8	17	1.6	6	1.3
Australia	3	0.3	10	0.4	21	0.6	27	0.6	23	0.5	12	0.5	4	0.5
Chinese Taipei	4	0.6	8	0.7	14	0.9	19	0.7	22	0.8	20	0.9	12	0.8
OECD Average	8	0.1	14	0.2	22	0.2	24	0.2	19	0.2	10	0.1	3	0.1

Percentage of students performing below and above the OECD average

Scientific literacy

Table 3.7 shows the percentage and standard errors for students performing below the OECD average and above the OECD average for PISA 2000, PISA 2003 and PISA 2006 for the ACT and Australia in scientific literacy.

- Over the three cycles, the percentage of students from the ACT performing above the OECD average in scientific literacy is 71 per cent³ (and is higher than the percentage for Australia overall of 62%).
- No significant differences were found between the proportion of students achieving below the OECD average across PISA cycles (ie, PISA 2000 and PISA 2003, PISA 2003 and PISA 2006, and PISA 2000 and PISA 2006) for students in the ACT or for Australia overall in scientific literacy.
- No significant differences were found between the percentage of students achieving above the OECD average across PISA cycles (ie, PISA 2000 and PISA 2003, PISA 2003 and PISA 2006, and PISA 2000 and PISA 2006) for students in the ACT or Australia overall in scientific literacy.

³ This percentage was calculated by averaging the percentage of students performing above the OECD average in PISA 2000, PISA 2003 and PISA 2006.

Table 3.7 Percentage of students achieving below and above the OECD average in scientific literacy

State	PISA 2000				PISA 2003				PISA 2006			
	Below OECD average		Above OECD average		Below OECD average		Above OECD average		Below OECD average		Above OECD average	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
ACT	29	3.3	71	3.3	29	2.1	71	2.1	30	2.2	70	2.2
Australia	38	1.7	62	1.7	39	0.9	61	0.9	39	0.9	61	0.9

Reading literacy

Table 3.8 shows the percentages and standard errors for students performing below the OECD average and above the OECD average for PISA 2000, PISA 2003 and PISA 2006 for the ACT and Australia in reading literacy.

- Over the three cycles, the percentage of students from the ACT performing above the OECD average in reading literacy is 72 percent² (and is higher than the percentage for Australia overall of 63%).
- No significant differences were found between the percentage of students achieving below the OECD average across PISA cycles (ie, PISA 2000 and PISA 2003, PISA 2003 and PISA 2006, and PISA 2000 and PISA 2006) for students in the ACT in reading literacy.
- No significant differences were found between the percentage of students achieving above the OECD average across PISA cycles (ie, PISA 2000 and PISA 2003, PISA 2003 and PISA 2006, and PISA 2000 and PISA 2006) for students in the ACT in reading literacy.
- The percentage of Australian students performing below the OECD average in reading literacy significantly increased by four per cent in PISA 2006 (39%) compared to PISA 2003 (35%), ie. the percentage of Australian students performing above the OECD average decreased from 65% in PISA 2003 to 61% in PISA 2006.

Table 3.8 Percentage of students achieving below and above the OECD average in reading literacy

State	PISA 2000				PISA 2003				PISA 2006			
	Below OECD average		Above OECD average		Below OECD average		Above OECD average		Below OECD average		Above OECD average	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
ACT	30	2.6	70	2.6	26	2.0	74	2.0	29	2.3	71	2.3
Australia	38	1.4	62	1.4	35	1.0	65	1.0	39	0.9	61	0.9

Mathematical literacy

Table 3.9 shows the percentage and standard error for students performing below the OECD average and above the OECD average for PISA 2000, PISA 2003 and PISA 2006 for the ACT and Australia in mathematical literacy.

- Over the three cycles, the percentage of students from the ACT performing above the OECD average in mathematical literacy is 70 percent (and is higher than the percentage for Australia overall of 62%).
- No significant differences were found between the percentage of students achieving below the OECD average across PISA cycles (ie, PISA 2000 and PISA 2003, PISA 2003 and PISA 2006, and PISA 2000 and PISA 2006) for students in the ACT in mathematical literacy.
- No significant differences were found between the percentage of students achieving above the OECD average across PISA cycles (ie, PISA 2000 and PISA 2003, PISA 2003 and PISA 2006, and PISA 2000 and PISA 2006) for students in the ACT in mathematical literacy.
- From PISA 2000 to PISA 2003, there was a significant increase (6%) in the Australian students who performed below the OECD average in mathematical literacy (from 34% in 2000 to 40% in 2003), ie. the percentage of students who performed above the OECD average decreased (from 66% to 60%).
- From PISA 2000 to PISA 2006, there was a significant increase (6%) in the Australian students who performed below the OECD average in mathematical literacy (from 34% in 2003 to 40% in 2006), ie. the percentage of students who performed above the OECD average decreased (from 66% to 60%).

Table 3.9 Percentage of students achieving below and above the OECD average in mathematical literacy

State	PISA 2000		PISA 2003		PISA 2006							
	Below OECD average	Above OECD average	Below OECD average	Above OECD average	Below OECD average	Above OECD average						
	%	SE	%	SE	%	SE						
ACT	31	3.8	69	3.8	29	1.7	71	1.7	31	2.6	69	2.6
Australia	34	1.7	66	1.7	40	0.9	60	0.9	40	1.0	60	1.0

Percentage of students below and above the OECD average by the lowest and highest socioeconomic quartile

Scientific literacy

Table 3.10 shows the percentage and standard error for students performing below the OECD average and above the OECD average for the lowest and highest quartile of SES in PISA 2000, PISA 2003 and PISA 2006, for the ACT and Australia in scientific literacy.

- Across the three cycles, the percentage of students from the ACT performing above the OECD average in the lowest quartile of SES for scientific literacy is 46 percent (and is similar to the percentage for Australia overall at 47 per cent).
- Across the three cycles, the percentage of students from the ACT performing above the OECD average in the highest quartile of SES for scientific literacy is 82 percent (and is slightly higher than the percentage for Australia overall of 79 per cent).
- No significant differences were found between the percentage of students achieving below the OECD average, or above the OECD average in the lowest SES quartile across PISA cycles (ie, PISA 2000 and PISA 2003, PISA 2003 and PISA 2006, and PISA 2000 and PISA 2006) for students in the ACT and for Australia overall in scientific literacy.
- No significant differences were found between the percentage of students achieving below the OECD average, or above the OECD average in the highest SES quartile across PISA cycles (ie, PISA 2000 and PISA 2003, PISA 2003 and PISA 2006, and PISA 2000 and PISA 2006) for students in the ACT and Australia overall in scientific literacy.

Reading literacy

Table 3.11 shows the percentage and standard error for students performing below the OECD average and above the OECD average for the lowest and highest quartile of SES in PISA 2000, PISA 2003 and PISA 2006, for the ACT and Australia in reading literacy.

- Across the three cycles, the percentage of students from the ACT performing above the OECD average in the lowest quartile of SES for reading literacy is 46 percent (and is similar to the percentage for Australia overall at 48 per cent).
- Across the three cycles, the percentage of students from the ACT performing above the OECD average in the highest quartile of SES for reading literacy is 84 percent (and is slightly higher than the percentage for Australia overall at 80 per cent).
- No significant differences were found between the percentage of students achieving below the OECD average, or above the OECD average in the lowest SES quartile across PISA cycles (ie, PISA 2000 and PISA 2003, PISA 2003 and PISA 2006, and PISA 2000 and PISA 2006) for students in the ACT in reading literacy.
- From PISA 2003 to PISA 2006, there was a significant increase (6%) in the Australian students who performed below the OECD average in the lowest SES quartile for reading literacy (from 49% in 2003 to 55% in 2006), ie. the percentage of students who performed above the OECD average in the lowest SES quartile decreased (from 51% to 45%).
- No significant differences were found between the percentage of students achieving below the OECD average, or above the OECD average in the highest SES quartile across PISA cycles (ie, PISA 2000 and PISA 2003, PISA 2003 and PISA 2006, and PISA 2000 and PISA 2006) for students in the ACT and Australia overall in reading literacy.

Mathematical literacy

Table 3.12 shows the percentage and standard error for students performing below the OECD average and above the OECD average for the lowest and highest quartile of SES in PISA 2000, PISA 2003 and PISA 2006, for the ACT and Australia in mathematical literacy.

- Across the three cycles, the percentage of students from the ACT performing above the OECD average in the lowest quartile of SES for mathematical literacy is 48 percent (and is slightly higher than the percentage for Australia overall at 46 per cent).
- Across the three cycles, the percentage of students from the ACT performing above the OECD average in the highest quartile of SES for reading literacy is 82 percent (and is slightly higher than the percentage for Australia overall at 79 per cent).
- No significant differences were found between the percentage of students achieving below the OECD average, or above the OECD average in the lowest SES quartile across PISA cycles (ie, PISA 2000 and PISA 2003, PISA 2003 and PISA 2006, and PISA 2000 and PISA 2006) for students in the ACT in mathematical literacy.
- No significant differences were found between the percentage of students achieving below the OECD average, or above the OECD average in the highest SES quartile across PISA cycles (ie, PISA 2000 and PISA 2003, PISA 2003 and PISA 2006, and PISA 2000 and PISA 2006) for students in the ACT in mathematical literacy.
- From PISA 2000 to PISA 2003, there was a significant increase (6%) in the Australian students who performed below the OECD average in the highest SES quartile for mathematical literacy (from 16% in 2000 to 23% in 2003), ie. the percentage of students who performed above the OECD average decreased (from 84% to 77%).
- From PISA 2000 to PISA 2006, there was a significant increase (7%) in the Australian students who performed below the OECD average in the highest SES quartile for mathematical literacy (from 16% in 2000 to 24% in 2006), ie. the percentage of students who performed above the OECD average decreased (from 84% to 76%).

Table 3.10 Percentage of students achieving below and above the OECD average by the lowest and highest SES quartile in scientific literacy

State	PISA 2000								PISA 2003								PISA 2006							
	Lowest quartile				Highest quartile				Lowest quartile				Highest quartile				Lowest quartile				Highest quartile			
	Below OECD average		Above OECD average		Below OECD average		Above OECD average		Below OECD average		Above OECD average		Below OECD average		Above OECD average		Below OECD average		Above OECD average		Below OECD average		Above OECD average	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
ACT	49	15.0	51	15.0	17	4.0	83	4.0	55	7.4	45	7.4	16	2.5	84	2.5	59	4.6	41	4.6	19	2.0	81	2.0
Australia	50	3.3	50	3.3	19	2.5	81	2.5	55	1.4	45	1.4	23	1.2	77	1.2	53	1.2	47	1.2	22	1.2	78	1.2

Table 3.11 Percentage of students achieving below and above the OECD average by the lowest and highest SES quartile in reading literacy

SES	PISA 2000								PISA 2003								PISA 2006							
	Lowest quartile				Highest quartile				Lowest quartile				Highest quartile				Lowest quartile				Highest quartile			
	Below OECD avg		Above OECD avg		Below OECD avg		Above OECD avg		Below OECD avg		Above OECD avg		Below OECD avg		Above OECD avg		Below OECD avg		Above OECD avg		Below OECD avg		Above OECD avg	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
ACT	49	8.6	51	8.6	16	3.7	84	3.7	53	8.1	47	8.1	14	2.3	86	2.3	59	4.8	41	4.8	18	2.5	82	2.5
Australia	53	2.2	47	2.2	19	2.1	81	2.1	49	1.4	51	1.4	20	1.2	80	1.2	55	1.2	45	1.2	23	1.3	77	1.3

Table 3.12 Percentage of students achieving below and above the OECD average by the lowest and highest SES quartile in mathematical literacy

SES	PISA 2000								PISA 2003								PISA 2006							
	Lowest quartile				Highest quartile				Lowest quartile				Highest quartile				Lowest quartile				Highest quartile			
	Below OECD avg		Above OECD avg		Below OECD avg		Above OECD avg		Below OECD avg		Above OECD avg		Below OECD avg		Above OECD avg		Below OECD avg		Above OECD avg		Below OECD avg		Above OECD avg	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
ACT	43	11.4	57	11.4	16	3.6	84	3.6	54	6.1	46	6.1	17	2.2	83	2.2	58	5.8	42	5.8	20	2.5	80	2.5
Australia	50	2.9	50	2.9	16	2.4	84	2.4	56	1.5	44	1.5	23	1.2	77	1.2	55	1.3	45	1.3	24	1.2	76	1.2

Percentage of students performing at or below proficiency level 2 and at or above proficiency level 3

Reading literacy

Table 3.13 shows the percentage and standard error for students performing at or below proficiency Level 2 and at or above proficiency Level 3 in reading literacy for PISA 2000, PISA 2003 and PISA 2006.

- The percentage of students from the ACT performing at or above Level 3 in reading literacy is 77 percent (and is higher than for the percentage for Australia overall of 68 percent).
- No significant differences were found between the percentage of students achieving at or below Level 2 across PISA cycles (ie, PISA 2000 and PISA 2003, PISA 2003 and PISA 2006, and PISA 2000 and PISA 2006) for students in the ACT in reading literacy.
- No significant differences were found between the percentage of students achieving at or above Level 3 across PISA cycles (ie, PISA 2000 and PISA 2003, PISA 2003 and PISA 2006, and PISA 2000 and PISA 2006) for students in the ACT in reading literacy.
- From PISA 2003 to PISA 2006, there was a significant increase (4%) in the Australian students who performed at or below Level 2 in reading literacy (from 30% in 2003 to 34% in 2006), ie. the percentage of students who performed at and above Level 3 decreased (from 70% to 66%).
- From PISA 2000 to PISA 2006, there was a significant increase (4%) in the Australian students who performed at or below Level 2 in reading literacy (from 31% in 2000 to 34% in 2006), ie. the percentage of students who performed at and above Level 3 decreased (from 69% to 66%).

Table 3.13 Percentage of students achieving below Level 2 and at or above Level 3 in reading literacy in PISA 2000, PISA 2003 and PISA 2006

State	PISA 2000				PISA 2003				PISA 2006			
	At or below Level 2		At or above Level 3		At or below Level 2		At or above Level 3		At or below Level 2		At or above Level 3	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
ACT	23	2.1	77	2.1	22	1.9	78	1.9	25	2.1	75	2.1
Australia	31	1.3	69	1.3	30	1.0	70	1.0	34	0.9	66	0.9

Mathematical literacy

Table 3.14 shows the percentage and standard error for students performing at or below proficiency Level 2 and at or above proficiency Level 3 in mathematical literacy for PISA 2003 and PISA 2006.

- The percentage of students from the ACT performing at or above Level 3 in mathematical literacy is 75 percent (and is higher than for the percentage for Australia overall at 67 percent).
- No significant differences were found between the percentage of students achieving at or below Level 2 across PISA cycles (ie, PISA 2003 and PISA 2006) for students in the ACT and for Australia in mathematical literacy.

- No significant differences were found between the percentage of students achieving at or above Level 3 across PISA cycles (ie, PISA 2003 and PISA 2006) for students in the ACT and for Australia in mathematical literacy.

Table 3.14 Percentage of students achieving below Level 2 and at or above Level 3 in mathematical literacy in PISA 2003 and PISA 2006

State	PISA 2003				PISA 2006			
	At or below Level 2		At or above Level 3		At or below Level 2		At or above Level 3	
	%	SE	%	SE	%	SE	%	SE
ACT	24	1.8	76	1.8	26	2.5	74	2.5
Australia	33	0.9	67	0.9	33	0.9	67	0.9

Percentage of students performing at or below proficiency level 2 and at or above proficiency level 3 by lowest and highest socioeconomic quartile

Reading literacy

Table 3.15 shows the percentage and standard error for students performing at or below proficiency Level 2 and at or above proficiency Level 3 for the lowest and highest SES quartile in reading literacy for PISA 2000, PISA 2003 and PISA 2006.

- The percentage of students from the ACT performing at or above Level 3 in reading literacy in the lowest SES quartile is 54 percent. The same percentage of Australian students were performing at or above Level 3 in reading literacy in the lowest SES quartile.
- The percentage of students from the ACT performing at or above Level 3 in reading literacy in the highest SES quartile is 87 percent (and is higher than for the percentage for Australia overall at 83 percent).
- No significant differences were found between the percentage of students achieving at or below Level 2 in the lowest or highest SES quartile across PISA cycles (ie, PISA 2000 and PISA 2003, PISA 2003 and PISA 2006, and PISA 2000 and PISA 2006) for students in the ACT and for Australia in reading literacy.
- No significant differences were found between the percentage of students achieving at or above Level 3 in the lowest or highest SES quartiles across PISA cycles (ie, PISA 2000 and PISA 2003, PISA 2003 and PISA 2006, and PISA 2000 and PISA 2006) for students in the ACT and for Australia in reading literacy.
- From PISA 2000 to PISA 2006, there was a significant increase (4%) in the Australian students who performed at or below Level 2 in the highest SES quartile for reading literacy (from 15% in 2000 to 19% in 2006), ie. the percentage of students who performed at or above Level 3 in the highest SES quartile decreased (from 85% in 2000 to 81% in 2006).
- From PISA 2003 to PISA 2006, there was a significant increase (6%) in the Australian students who performed at or below Level 2 in the lowest SES quartile for reading literacy (from 43% in 2003 to 49% in 2006), ie. the percentage of students who performed at or above Level 3 in the lowest SES quartile decreased (from 57% in 2003 to 51% in 2006).

Table 3.15 Percentage of students achieving below Level 2 and at or above Level 3 for the lowest and highest SES quartile in reading literacy in PISA 2000, PISA 2003 and PISA 2006

SES	PISA 2000								PISA 2003							
	Lowest quartile				Highest quartile				Lowest quartile				Highest quartile			
State	At or below Level 2		At or above Level 3		At or below Level 2		At or above Level 3		At or below Level 2		At or above Level 3		At or below Level 2		At or above Level 3	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
ACT	38	9.5	62	9.5	11	3.4	89	3.4	46	7.1	54	7.1	12	2.4	88	2.4
Australia	45	1.8	55	1.8	15	1.9	85	1.9	43	1.3	57	1.3	16	1.1	84	1.1

SES	PISA 2006							
	Lowest quartile				Highest quartile			
State	At or below Level 2		At or above Level 3		At or below Level 2		At or above Level 3	
	%	SE	%	SE	%	SE	%	SE
ACT	55	4.9	45	4.9	15	1.9	85	1.9
Australia	49	1.3	51	1.3	19	1.2	81	1.2

Mathematical literacy

Table 3.16 shows the percentages and standard errors for students performing at or below proficiency Level 2 and at or above proficiency Level 3 for the lowest and highest socioeconomic quartile in mathematical literacy for PISA 2003 and PISA 2006.

- The percentage of students from the ACT performing at or above Level 3 in mathematical literacy in the lowest SES quartile is 50 percent (and is lower than the percentage for Australia overall at 52 percent).
- The percentage of students from the ACT performing at or above Level 3 in mathematical literacy in the highest SES quartile is 85 percent (and is higher than the percentage for Australia overall at 82 percent).
- No significant differences were found between the percentage of students achieving at or below Level 2 in the lowest or highest SES quartile across PISA cycles (ie, PISA 2003 and PISA 2006) for students in the ACT and for Australia in mathematical literacy.
- No significant differences were found between the percentage of students achieving at or above Level 3 in the lowest or highest SES quartiles across PISA cycles (ie, PISA 2003 and PISA 2006) for students in the ACT and for Australia in mathematical literacy.

Table 3.16 Percentage of students achieving below Level 2 and at or above Level 3 in mathematical literacy for the lowest and highest SES quartile in PISA 2003 and PISA 2006

SES	PISA 2003								PISA 2006							
	Lowest quartile				Highest quartile				Lowest quartile				Highest quartile			
State	At or below Level 2		At or above Level 3		At or below Level 2		At or above Level 3		At or below Level 2		At or above Level 3		At or below Level 2		At or above Level 3	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
ACT	48	6.3	52	6.3	13	2.0	87	2.0	51	5.8	49	5.8	16	2.6	84	2.6
Australia	48	1.5	52	1.5	17	1.0	83	1.0	48	1.3	52	1.3	18	1.2	82	1.2

4. Socioeconomic gradients

The terms 'socioeconomic gradient' or 'social gradient' refers to the relationship between an outcome and socioeconomic background. In the case of PISA the outcome considered is students' performance and the measure of socioeconomic performance is the ESCS index. PISA data show that there is a significant relationship between students' performance and their socioeconomic background as measured by ESCS. This relationship is evident in Australia and all PISA countries, although the strength of the relationship differs among countries. In a graphical representation the line of best fit for the points that represent performance against socioeconomic background (ESCS) provides information about several aspects of the relationship. The line is referred to as the social gradient.

The analysis of socioeconomic gradients is a means of characterising student performance and providing guidance for educational policy. Socioeconomic gradients can be used to compare the relationships between outcomes and student background across countries and to examine changes in gradients that occur from one cycle of PISA to another.

Four types of information are relevant to a consideration of social gradients;

- The *strength* of the relationship between science achievement and socioeconomic background. Although it is not always evident from a graphical presentation (even if individual data points for students are represented as a scatter plot) it is important to consider how closely individual results fit to the line of best fit. In other words, are the points representing the performance and ESCS measures for all the individual students situated close to the line of best fit or are they widely scattered about it? The closer all the points are to the line of best fit, the greater is the strength of the relationship. This aspect of the social gradient is represented by the percentage of the variation in performance that can be explained by the ESCS index. If the percentage is large it indicates that performance is relatively highly determined by ESCS whereas if it is small it indicates that performance is not highly determined by ESCS. For OECD countries as a whole, the strength of the relationship between science achievement and socioeconomic background is 14.4.
- The *slope* of the gradient line is an indication of the extent of inequality in the relationship between students' results and their socioeconomic background (as measured by ESCS). A steeper slope indicates a greater difference in performance between low socioeconomic background students and high socioeconomic background students. Education systems typically aim to decrease the differences in performance between different social groups. Greater equity would thus be indicated by a flatter gradient.
- The average *level* of the line in the graph gives an indication of how well the overall population has achieved on the given assessment. Lines at higher levels indicate higher mean performance by the students.
- The *length* of the line indicates the *range* of ESCS. The graphs in this chapter are plotted between the 5th percentile of ESCS and the 95th percentile of ESCS, that is the graphs span the middle 90 per cent of the values of ESCS for each country. A smaller range indicates less difference in socioeconomic background between students from the highest and lowest socioeconomic backgrounds in the country. The range can be measured by projecting the starting point and finishing point of the gradient onto the horizontal axis.

Figure 4.1 shows the range of scores on the ESCS (socioeconomic) index for the states. The range of scores in the ACT is 2.24 index points, narrower than that of any other state. The score at the 5th percentile is higher for the ACT than for any other state, and the score at the 95th percentile is higher than for any other state. The mean socioeconomic score is higher for the ACT than for any other state.

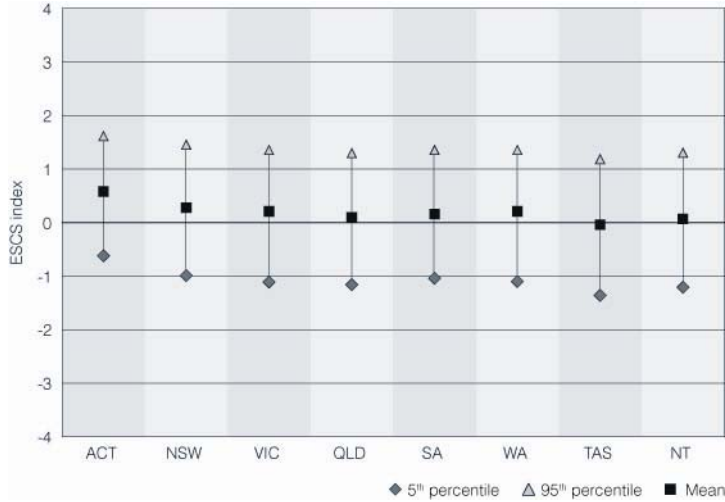


Figure 4.1 Range of ESCS for states

Figure 4.2 shows the socioeconomic gradient for the states for scientific literacy.

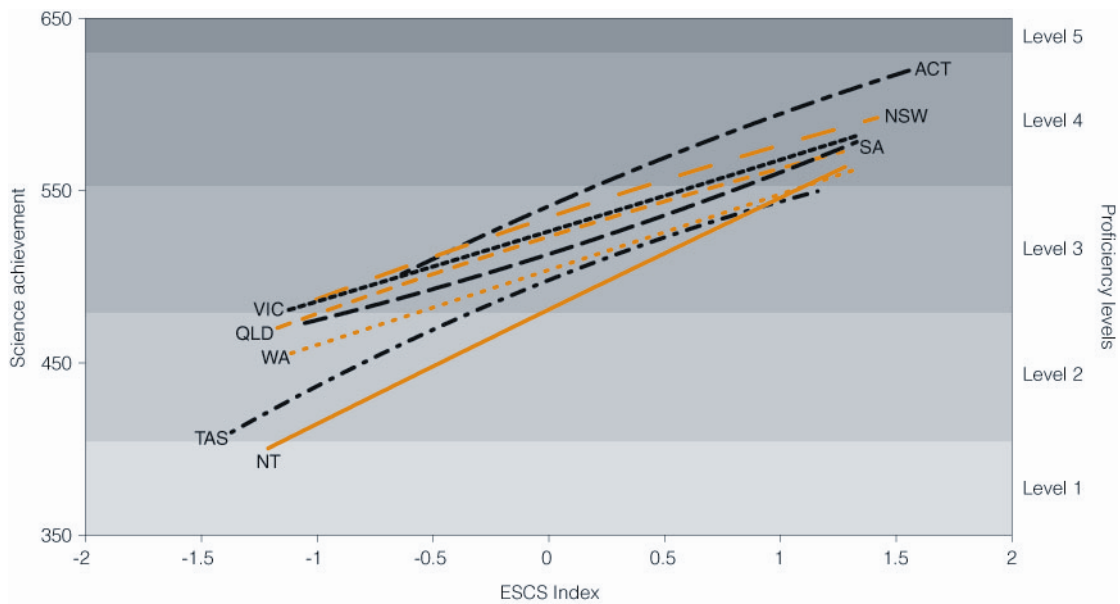


Figure 4.2 Socioeconomic gradients for the states, scientific literacy

Figure 4.2 illustrates the following:

- The gradient for the Northern Territory is the steepest, with the Australian Capital Territory almost as steep, while Victoria has the flattest slope.

- The graphs for Tasmania and the Australian Capital Territory have a negative curvilinearity (the curvature of the line), indicating that the influence of socioeconomic background on science achievement ‘flattens out’ at higher levels, i.e. that there is a decreasing return on achievement for socioeconomic background past a certain point. South Australia’s slope on the other hand shows a positive curvilinearity, indicating a higher rate of increase in science scores for students in high socioeconomic backgrounds than for students with low socioeconomic backgrounds.
- The average socioeconomic background for the Australian Capital Territory is generally higher than that of other states. Performance is also generally higher than that of students in other states.
- Performance across the states at the lower levels of ESCS has a wider range than at the higher levels; as was found internationally the range of the states’ performance converges at higher levels of ESCS.

Figure 4.3 shows the socioeconomic gradient lines for reading in PISA 2006. Some similar patterns can be seen in reading as for science – there is less dispersion at the higher ESCS levels than at the lower levels, and Tasmania, the Australian Capital Territory and the Northern Territory show a negative curvilinearity, (that of Tasmania is a little more pronounced).

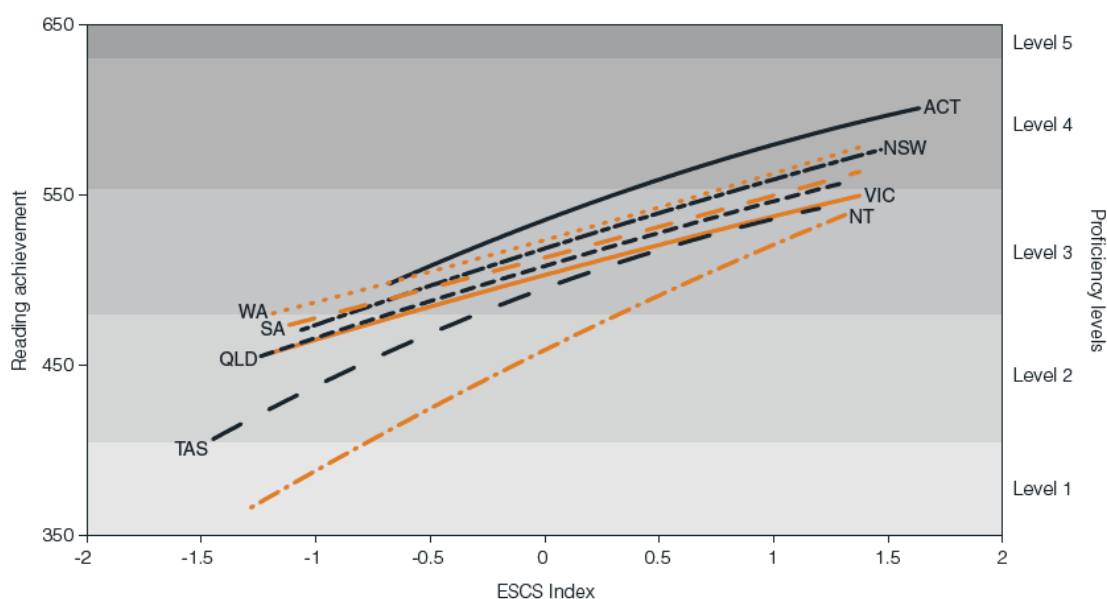


Figure 4.3 Socioeconomic gradients for the states, reading literacy

A similar pattern can be seen in the socioeconomic gradients for mathematics in PISA 2006, as shown in Figure 4.4. There is more convergence at the higher levels of ESCS, and the slopes are generally flatter. In other words socioeconomic background appears to be less of an influence on achievement in mathematics than in the other two literacy domains.

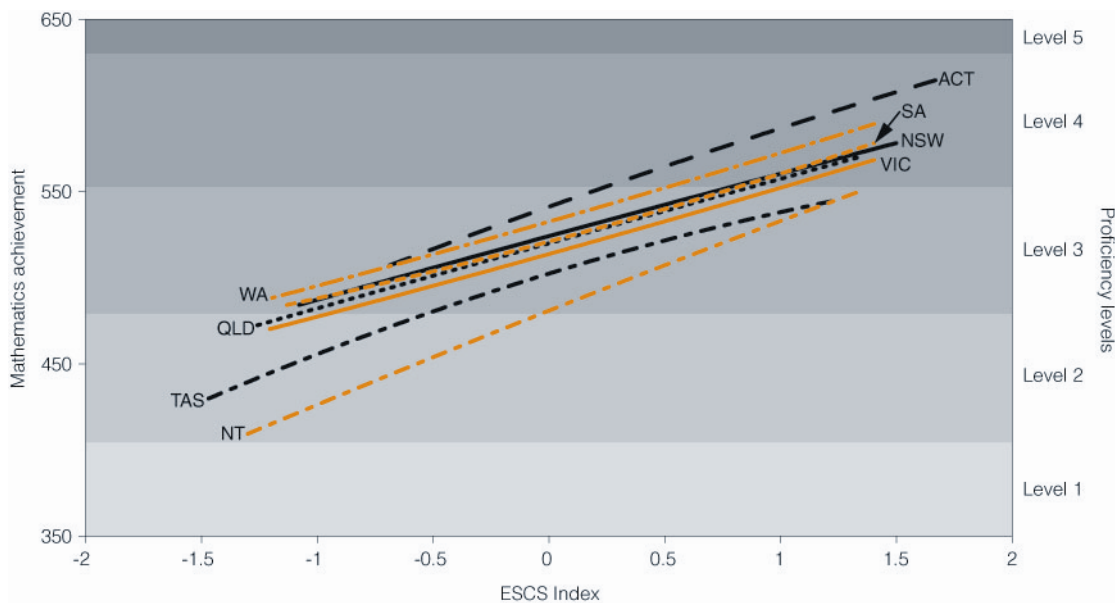


Figure 4.4 Socioeconomic gradients for the states, mathematical literacy

Figure 4.5 summarises findings about the influence of socioeconomic level by contrasting average performance in science (shown on the y-axis) with the strength of the relationship between socioeconomic background and science performance, which is used as a proxy for equity in the distribution of learning opportunities (shown on the x-axis). The Australian states have been included in this figure.

Australia and most of the states lie in the top right quadrant of this figure, as was the case for mathematical literacy in PISA 2003. Australia, along with countries such as Finland, Hong-Kong China, Japan and Canada, in the top right-hand quadrant of the graph, is an example of a country with above average performance in science and a below-average impact of socioeconomic background on performance. New South Wales, Western Australia, South Australia, Queensland and Victoria are similarly characterised.

Countries such as New Zealand, the Netherlands and Germany, as well as the Australian Capital Territory and Tasmania, are countries and states with high levels of student performance and an above-average impact of socioeconomic background on student performance in science (top left quadrant of the graph). Countries such as the United States and France, as well as the Northern Territory, have a below-average level of performance in science and an above-average impact of socioeconomic background on performance. Countries such as Italy and Norway, in the bottom right quadrant of the Figure, are countries in which performance is relatively low but not strongly related to students' socioeconomic background.

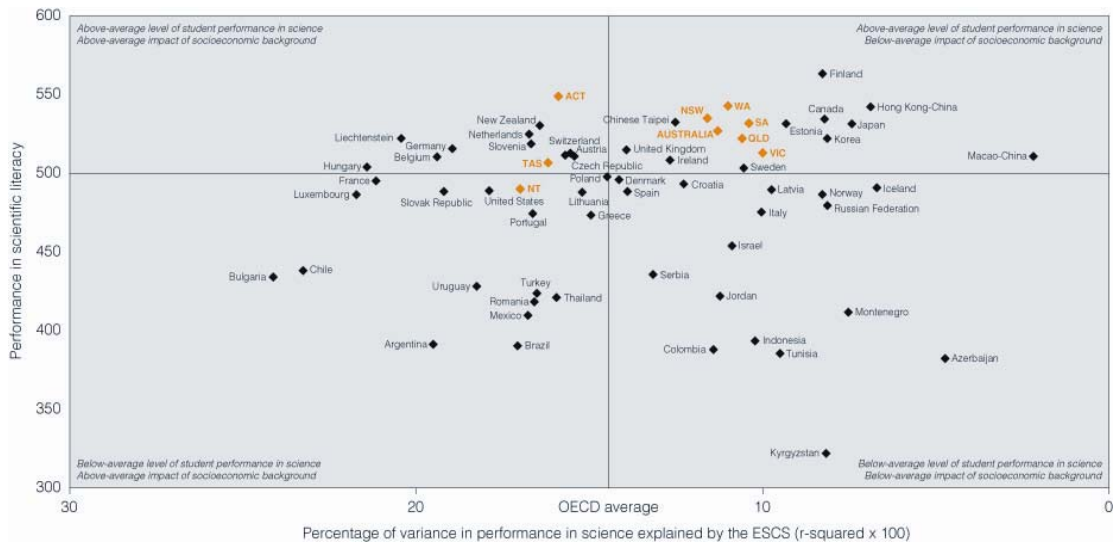


Figure 4.5 Performance in scientific literacy and the impact of socio-economic background