

# **NSW and ACT school leavers and the conversion of SAT1 to an equivalent UAI.**

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*Some NSW & ACT high school leavers graduate high school while overseas. These students potentially enrich Australian university communities with their global outlook. Many of these students seek entry to NSW & ACT university courses through the University Admissions Centre (UAC) on the basis of the American College Board's Scholastic Aptitude Test 1 (SAT1).*

*This report examines the nature of the SAT1 and then compares SAT1 scores with NSW & ACT University Admission Index (UAI) scores.*

*UAC affiliated tertiary institutions assess SAT1 scores on the basis of a "Common Assessment Schedule" that appears to create barriers to university entry for NSW & ACT students who graduate from high school while overseas. These students appear to be penalised by up to 6 UAI points in the process of converting a SAT1 score to a UAI score.*

*After examining the current Assessment Schedule and some of its effects on Australian students, this report recommends an updated Assessment Schedule based on the 2006 SAT1 cohort.*

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### **NSW & ACT School leavers with SAT1 qualifications**

NSW & ACT students complete high school overseas for many reasons including parental work placement and student exchange. The Australian university community is enriched by these students. Australia's international competitiveness is based on quality skills and global outlook. Students with life experience outside Australia, often knowing another world language, bring with them experience in navigating cross cultural situations and a world encompassing perspective.

While many of these students complete Australian high school qualifications by home based distance education, others do not. These students perform better with the socialisation provided by local high schools compared to home based study. US schools and many International Schools around the world prepare students to sit the SAT1 and Advanced Placement (AP) tests and, at graduation, provide students with a High School diploma. With these qualifications, NSW & ACT school leavers may enter participating universities through the University Admissions Centre (UAC).

What are the SAT1 and AP tests?

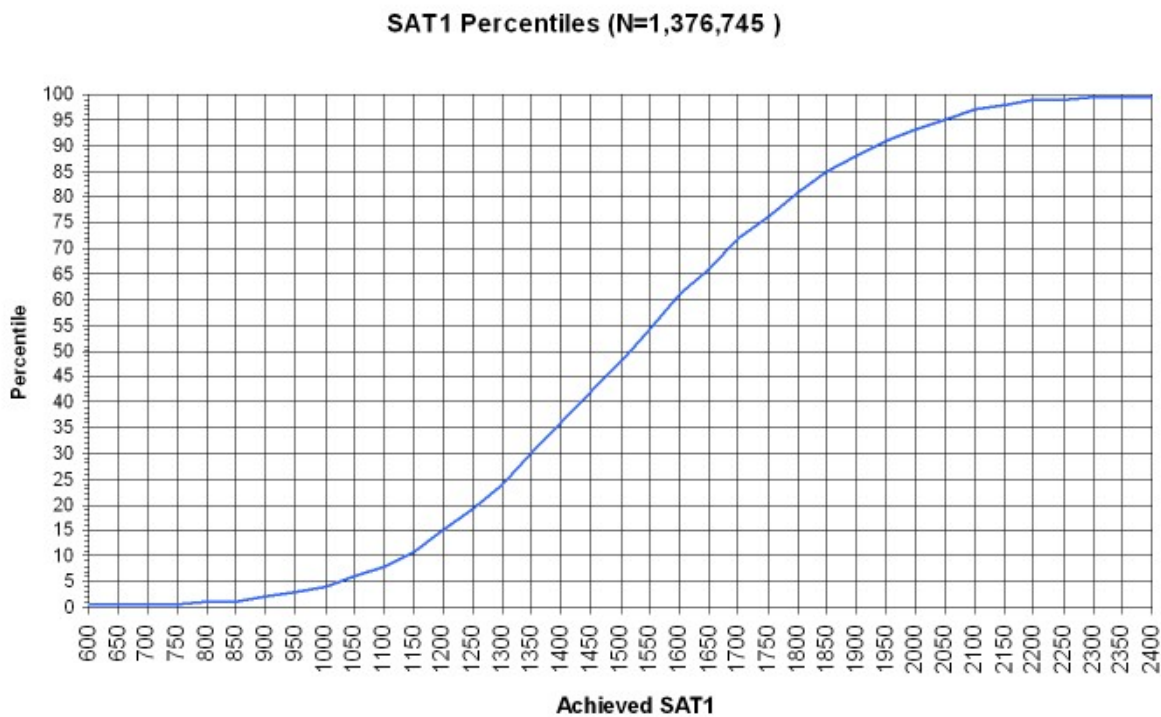
### **SAT1**

The United States of America Scholastic Aptitude Test (SAT) 1 is a tertiary entrance test administered multiple times each year by the College Board and consists of three sections; Verbal, Mathematics and Writing. Each section is marked in a range of 200-800. The composite mark of the three sections is then out of a maximum possible 2400.

The 2005/6 SAT1 cohort of 1,376,745 university-bound students achieved a mean composite mark of 1518 with a standard deviation is 308. (College Board 2006)

The SAT1 test has a participation rate among graduating year 12 students of 48%<sup>1</sup> These graduating students make up approximately 68.3% of their age cohort who completed year 9 together (United Health Foundation 2005). This means that the SAT1's participation rate is 33% of their age cohort. This group is self-selected and largely consists of students who aspire to enter university.

SAT1 scores have an approximate normal distribution and in order to compare SAT1s with UAI's we need the percentiles associated with different SAT1 scores. The College Board (2006) has provided these percentiles as shown in Chart 1 and listed in Appendix 1.



**Chart 1.**

A student scoring 1125 on the SAT1 is a bottom 10% student, while a student scoring 1950 is a top 10% student.

### ***Advanced Placement Tests (AP)***

AP tests are American subject tests administered by the College Board. There are more than 30 subject areas with defined curriculum covering major High School topics familiar to Australian educators (College Board 2006a). The AP tests results are reported by the College Board as A, B, C.

Now, let us turn our attention to the NSW & ACT UAI.

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<sup>1</sup> Advised to the author by the College Board in email correspondence. This may be confirmed by contacting the board at [www.collegeboard.com](http://www.collegeboard.com)

## **University Admission Index (UAI)**

The NSW & ACT University Admission Index is a number between 0 and 100 on the basis of which students may be competitively admitted to participating Australian tertiary institutions. The number represents the percentile ranking of the student's achievement compared to all students who started high school in Australia in the same year. (NSW Vice-Chancellors Conference 1998 p5)

While UAIs are awarded to approximately 75% of those who started high school in the same year (ABS 2004), the UAI's cohort is all students irrespective of whether they completed high school or not.

Unlike the SAT1, the UAI has, by definition, a uniform distribution. It is uniform if we include all students who started high school together. Because UAI scores are not actually awarded to all of these students, the uniformity is limited to UAI25 and above. In practice UAI scores less than 30 are reported as "30 or less" (Technical Committee on Scaling 2005 p5)

How is conversion done by the Universities Admissions Centre?

### **Current Assessment of Qualifications**

The Universities Admissions Centre (NSW & ACT) assists participating Australian tertiary institutions by providing a "Common Assessment Schedule" (UAC 2005) to assist them with converting SAT1+AP aggregate scores to equivalent UAI scores.

The schedules associated with the SAT1 for 2005/6 are SR S5053-55. The schedules have been produced on the basis of observed score distributions, or if that was not available, on the basis of expert judgment. They were accepted by decision of the "Common Assessment Procedures Sub-committee" on 04 April 2005. (UAC 2005).

While the College Board reports AP results as "A", "B", "C", UAC interprets these grades numerically. The aggregate is formed by adding together AP test results of "C" or better with A=5, B=4, C=3. The schedules assign a UAI to students based on their SAT1 and AP Aggregate as shown in the following table.

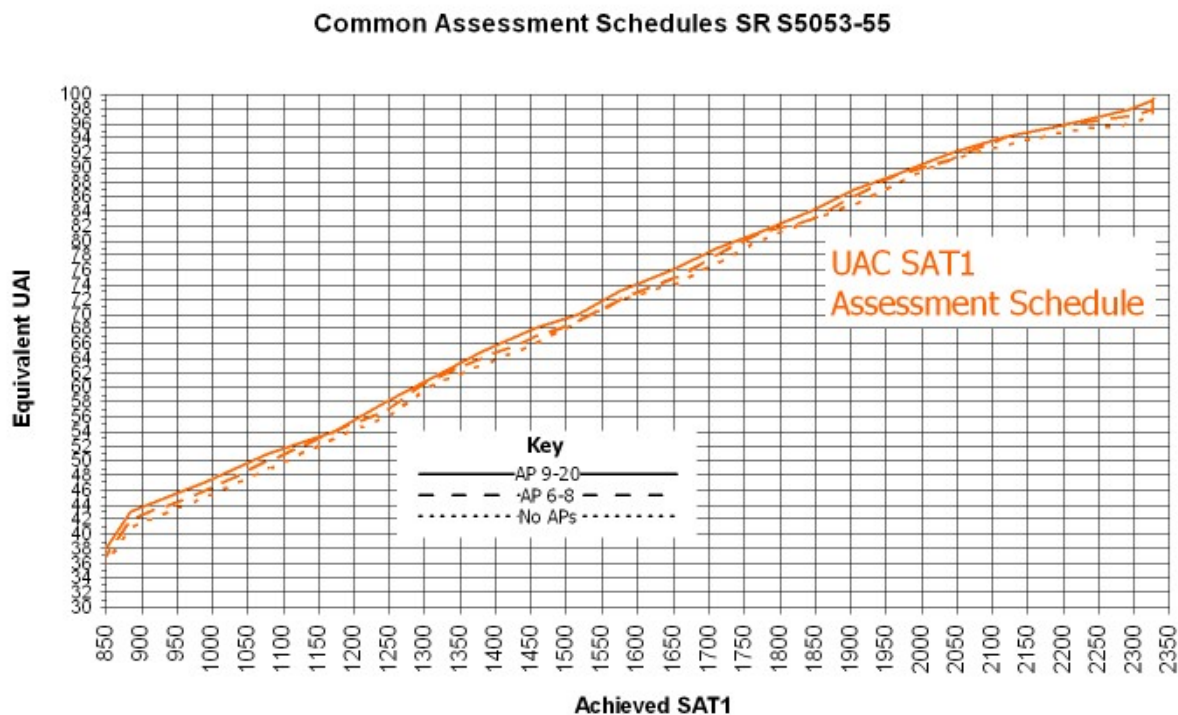
SAT	AP Aggregate		
	0-5	6-8	9-20
2326	98	99	99.5
2325	97	98	99
2295	96	97	98
2205	95	96	96
2115	93	94	94
2040	91	91	92
1965	88	89	89
1905	85	86	87
1845	83	83	84
1770	80	81	81
1710	77	78	79
1650	74	75	76

1575	72	72	73
1515	69	69	70
1455	66	67	68
1380	63	64	65
1305	60	61	61
1245	56	57	58
1170	53	54	54
1080	49	50	51
990	45	46	47
885	41	42	43
850	36	37	38

**Table 1.** *Extracted from current Assessment Schedules SR S5053-55*

By examining Table 1 we can see that on average there is a 0.8 mark increase in awarded UAI when moving from the 0-5 aggregate band to the 6-8 band or from the 6-8 band to the 9-20 band.

Table 1. may be visualised as the following chart:



**Chart 2.**

From this chart, we can see that a student (with AP Aggregate of 9) who achieves an average SAT1 score (1520) would currently be awarded a UAI of 70. A student scoring on the 10<sup>th</sup> percentile of the SAT1 (1125), would be awarded UAI53. And, a SAT1 1950 student who scores in the top 10% of the American cohort would be awarded UAI88.

## ***On Converting a SAT1 score to a UAI score***

So far we have looked at the SAT1, UAI and UAC's conversion schedules. Let us turn our attention to the business of converting scores, and the assumptions that we need to make about the relative abilities of the cohorts of students sitting the SAT1 and the UAI.

### **Cohort Equivalence**

Following (NSW Vice-Chancellors Conference 1998) p2, and broadening the definition of "state" to mean "nation state", this report accepts "the assumption that the age cohorts from which each State's candidature are drawn are equally able to undertake university study."

Following from this, if the SAT1, as well as the UAI, cohort was all students who started high school, then they could be directly compared. However we have already seen that the participation rate of the SAT1 is approximately 33% of American students. How then can we map SAT1 scores to UAIs?

We can observe that the SAT1 cohort is more able to undertake university study than the UAI cohort. This follows from our earlier observation that the SAT1 cohort is the 33% of American high school starters who aspire to enter university, while the UAI cohort represents all Australian students who started high school. The average SAT1 student will be more capable than the UAI50 student.

One simplistic approach to equating SAT1 to UAI scores would be to map all SAT1 scores to the range UAI67-UAI100. This would be reasonable if we assumed that the best 33% of all American students sat the SAT1. This assumption is hard to defend.

A second equally unsatisfactory approach would be to map all SAT1 scores to the range UAI 0 to UAI 100. This would only be reasonable if the SAT1 cohort was all American students who started high school.

The approach adopted by this report is to say with (NSW Vice-Chancellors Conference 1998) p2 "The truth lies somewhere in between." and map the SAT1 range to the range UAI 33.5 to UAI 100. This splits the difference between the first two alternatives. While probably underselling the qualities of the university bound SAT1 cohort, this is a conservative approach to cohort equivalence appropriate for conversion purposes.

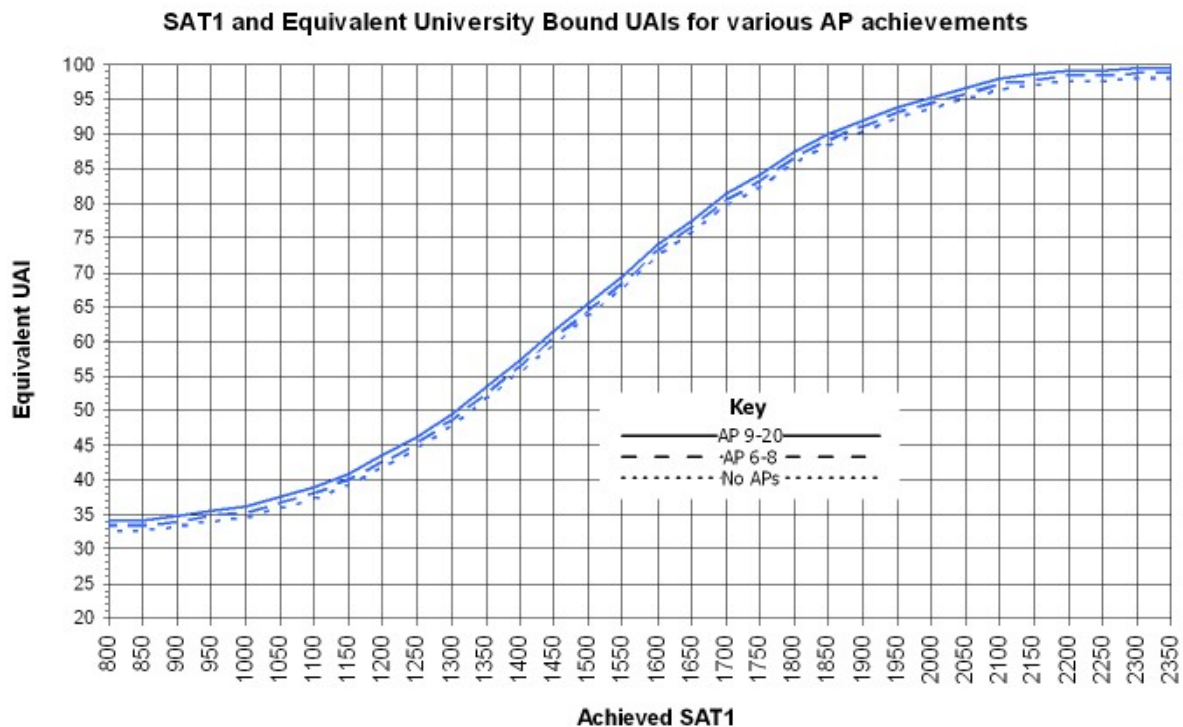
## Updated Assessment Schedule

On the basis of:

- The latest percentile data from the College Board,
- The “split the difference” approach to cohort equivalence, and
- allowing a 0.8 mark gap between AP Aggregate bands,

SAT1 scores may be converted to UAI's by using Chart 3 below.

Chart 3 maps the SAT1 range into the portion of the UAI above UAI33.5 You can see that the shape is similar to what as we saw in Chart 1.



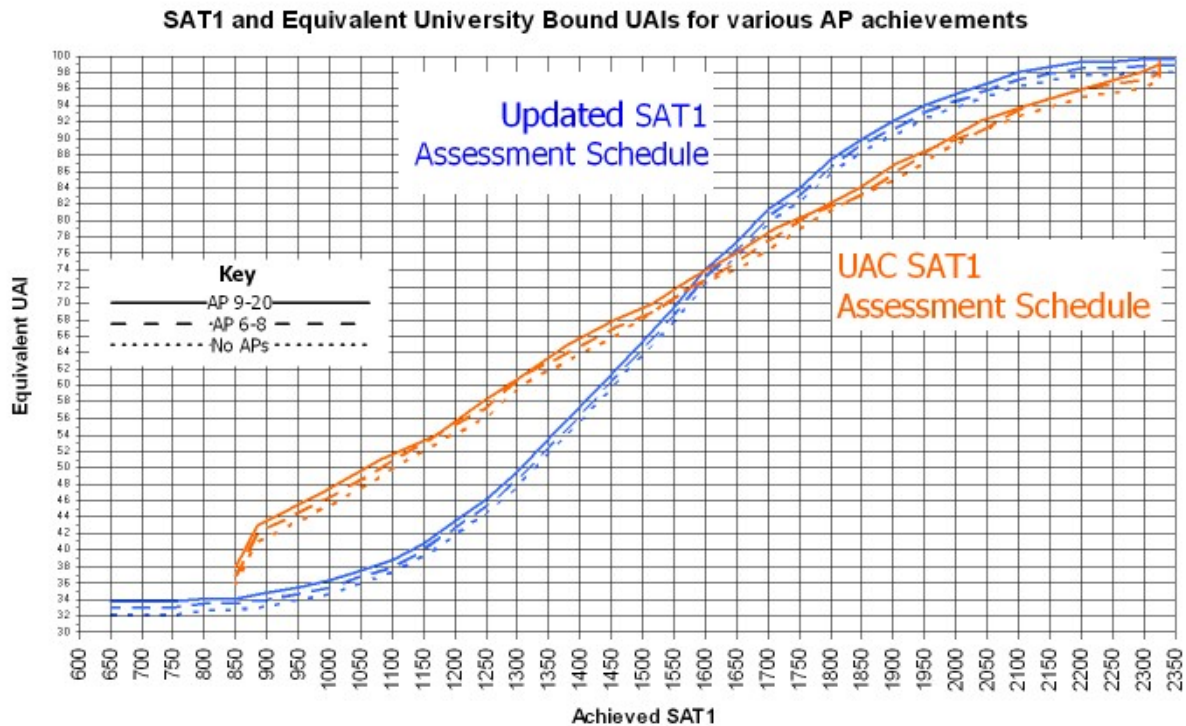
**Chart 3.**

From this chart, we can see that an example student (with AP Aggregate of 9) who achieves an average SAT1 score (1520) may be awarded a UAI of 67. A student scoring on the 10<sup>th</sup> percentile of the SAT1 (1125), may be awarded UAI40. And, a SAT1 1950 student who scores in the top 10% of the American cohort may be awarded UAI94.

## Impact of the current Assessment Schedule

The current Assessment Schedule appears to under-estimate the difficulty of achieving high SAT1 scores and also to under-estimate the ease of achieving low SAT1 scores! The effect is to boost the competitiveness of some SAT1 holders for entrance to participating Australian tertiary institutions, and appears to penalise others.

This can be seen by overlaying the Updated Assessment Schedule (Chart 3.) with the current Assessment Schedules graph (Chart 2.)



**Chart 4.**

From this chart, we can see how the current Assessment Schedule affects students.

A student scoring on the 10<sup>th</sup> percentile of the SAT1 (1125), does well with a 12 point boost! Unfortunately, however our SAT1 1950 student will receive a nearly 6 point penalty.



## How is the boost and penalty distributed?

From the few examples above, we can see that the effect of the current Assessment Schedule's approach is not uniform. Chart 5. shows the apparent amount of the boost and penalty for students of differing SAT1 scores:

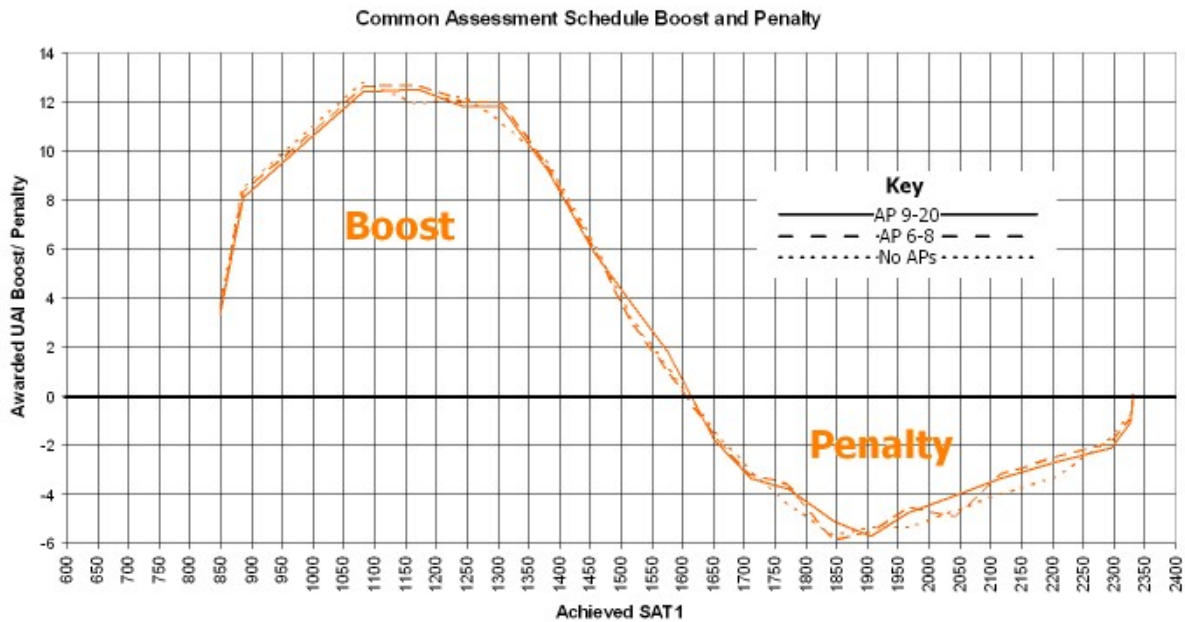


Chart 5.

From this chart we can see that the students who achieve SAT1 1100 receive the maximum boost of 13 UAI points and students with SAT1 1850 appear to be penalised the hardest at almost -6 UAI points. Students who score SAT1 1600 are neither boosted nor penalised.

The range of penalties exceeding 3 UAI points occurs right around the critical area of entrance cutoffs for NSW & ACT university courses. The current Assessment Schedule appears to apply a boost to non-competitive university applicants and a penalty to those who are competitive.

## ***Moving Forward – An Updated Assessment Schedule***

This report commends the following updated SAT1 Assessment Schedule for use by UAC in assessing the SAT1 score from 2006 onwards. This updated Assessment Schedule was shown graphically in Chart 3. As explained earlier, it is based on the percentiles provided by (College Board 2006), conservative cohort equivalence assumptions, and maintains a 0.8 mark gap between AP Aggregate bands.

	AP Aggregate		
	AP0-5	AP6-8	AP9-20
<b>2400</b>	98.1	98.9	99.7
<b>2350</b>	98.1	98.9	99.7
<b>2300</b>	98.1	98.9	99.7
<b>2250</b>	97.7	98.5	99.3
<b>2200</b>	97.7	98.5	99.3
<b>2150</b>	97.1	97.9	98.7
<b>2100</b>	96.4	97.2	98.0
<b>2050</b>	95.1	95.9	96.7
<b>2000</b>	93.7	94.5	95.3
<b>1950</b>	92.4	93.2	94.0
<b>1900</b>	90.4	91.2	92.0
<b>1850</b>	88.4	89.2	90.0
<b>1800</b>	85.8	86.6	87.4
<b>1750</b>	82.4	83.2	84.0
<b>1700</b>	79.8	80.6	81.4
<b>1650</b>	75.8	76.6	77.4
<b>1600</b>	72.5	73.3	74.1
<b>1550</b>	67.8	68.6	69.4
<b>1500</b>	63.8	64.6	65.4
<b>1450</b>	59.8	60.6	61.4
<b>1400</b>	55.8	56.6	57.4
<b>1350</b>	51.9	52.7	53.5
<b>1300</b>	47.9	48.7	49.5
<b>1250</b>	44.5	45.3	46.1
<b>1200</b>	41.9	42.7	43.5
<b>1150</b>	39.2	40.0	40.8
<b>1100</b>	37.2	38.0	38.8
<b>1050</b>	35.9	36.7	37.5
<b>1000</b>	34.6	35.4	36.2
<b>950</b>	33.9	34.7	35.5
<b>900</b>	33.2	34.0	34.8
<b>850</b>	32.6	33.4	34.2
<b>800</b>	32.6	33.4	34.2
<b>750</b>	32.2	33.0	33.8
<b>700</b>	32.2	33.0	33.8
<b>650</b>	32.2	33.0	33.8
<b>600</b>	31.9	32.7	33.5

**Table 2 Updated SAT1 Assessment Schedules**

## **Conclusion**

While the door is currently open for NSW & ACT school leavers to enter tertiary courses on the basis of SAT1 qualifications, the door seems to be open only part way.

Based on conservative assumptions of cohort equivalence, this report has shown how the current schedule gives a significant boost to the scores of non-competitive school leavers, and at the same time, makes it tough for NSW & ACT students to enter courses at UAC's participating universities on the basis of SAT1 qualifications.

The prospective students who are most affected by this are the NSW & ACT school leavers with international experience, a global outlook, and who potentially enrich the university community.

Based on these concerns, there appears to be good reason for adopting the updated SAT1 Assessment Schedule recommended by this report.

## Appendix 1 - SAT Percentile Ranks

(Data provided by the College Board)

2006 College-Bound Seniors—Critical Reading + Mathematics + Writing

Score	Per-centile	Score	Per-centile	Score	Per-centile	Score	Per-centile	Score	Per-centile
2400	99.5 <sup>2</sup>	2030	94	1660	67	1290	23	920	2
2390	99.5	2020	94	1650	66	1280	22	910	2
2380	99.5	2010	94	1640	65	1270	21	900	2
2370	99.5	2000	93	1630	64	1260	20	890	2
2360	99.5	1990	93	1620	63	1250	19	880	1
2350	99.5	1980	92	1610	62	1240	18	870	1
2340	99.5	1970	92	1600	61	1230	18	860	1
2330	99.5	1960	91	1590	59	1220	17	850	1
2320	99.5	1950	91	1580	58	1210	16	840	1
2310	99.5	1940	90	1570	57	1200	15	830	1
2300	99.5	1930	90	1560	56	1190	14	820	1
2290	99.5	1920	89	1550	54	1180	13	810	1
2280	99.5	1910	89	1540	53	1170	13	800	1
2270	99	1900	88	1530	52	1160	12	790	1
2260	99	1890	87	1520	51	1150	11	780	0.5 <sup>3</sup>
2250	99	1880	87	1510	49	1140	11	770	0.5
2240	99	1870	86	1500	48	1130	10	760	0.5
2230	99	1860	85	1490	47	1120	9	750	0.5
2220	99	1850	85	1480	46	1110	9	740	0.5
2210	99	1840	84	1470	44	1100	8	730	0.5
2200	99	1830	83	1460	43	1090	8	720	0.5
2190	98	1820	82	1450	42	1080	7	710	0.5
2180	98	1810	82	1440	41	1070	7	700	0.5
2170	98	1800	81	1430	39	1060	6	690	0.5
2160	98	1790	80	1420	38	1050	6	680	0.5
2150	98	1780	79	1410	37	1040	5	670	0.5
2140	98	1770	78	1400	36	1030	5	660	0.5
2130	97	1760	77	1390	35	1020	5	650	0.5
2120	97	1750	76	1380	33	1010	4	640	0.5
2110	97	1740	75	1370	32	1000	4	630	0.5
2100	97	1730	75	1360	31	990	4	620	0.5
2090	96	1720	74	1350	30	980	3	610	0.5
2080	96	1710	73	1340	29	970	3	600	0
2070	96	1700	72	1330	28	960	3		
2060	95	1690	71	1320	26	950	3		
2050	95	1680	70	1310	25	940	3		
2040	95	1670	68	1300	24	930	2		

Source: College Board (2006)

<sup>2</sup> The College Board publishes whole number percentiles and lists scores of 2280 and above as "99+"

<sup>3</sup> The College Board publishes whole number percentiles and lists scores of 780 and below as "1-"

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