

# Review of Selective Education Access

Findings and Action Plan

**DECEMBER 2018**

# REVIEW OF SELECTIVE EDUCATION ACCESS

# STUDENT JOURNEY



## Do I apply?

### PROBLEMS

- Fewer applications from educationally disadvantaged students, Aboriginal students, students with disability, and girls
- Rural and remote-area students face distinctive barriers to access
- Not all gifted students are aware of the test or encouraged to apply

### PROPOSED SOLUTIONS

- Improve communications and other prompts to encourage more applications from under-represented groups
- Work with schools and families in rural and remote areas to make the selection process more relevant
- Provide supportive materials to schools to help their communications with families



## Do I sit the test?

### PROBLEMS

- Rigid test schedules and locations
- Some current disability provisions are unsuitable

### PROPOSED SOLUTIONS

- Investigate flexibility in test schedules and test centres
- Work with families, schools and advocates to ensure appropriate provisions and adjustments for gifted students with disability



## Does my score reflect my ability?

### PROBLEMS

- Weaknesses in test design reduce its effectiveness in assessing ability
- Not all students know what to expect
- School Assessment Score introduces inconsistencies and imposes a considerable workload burden on schools

### PROPOSED SOLUTIONS

- Improved 2019 tests
- New test design from 2020
- Improve department's communications about appropriate test preparation so students feel confident to do their best
- Partner with schools and communities to ensure a transparent, equitable process for determining the School Assessment Score



## Am I offered a place?

### PROBLEMS

- System of school placement is confusing
- More places are available for boys than girls

### PROPOSED SOLUTIONS

- Investigate improvements to school nomination process (e.g. transparency)
- Investigate ways to close the gender gap



## Do I accept?

### PROBLEMS

- Girls decline offers more often than boys, contributing to a gender gap in selective schools
- A student's selection test results could help inform learning plans, but students cannot easily choose to provide that data to their school

### PROPOSED SOLUTIONS

- Investigate the causes of girls' under-representation and ways to close the gender gap
- Enable students and their families to choose to link selection data to their current and future school



# ACTION PLAN

## DELIVERING A MODERN, WORLD-CLASS SELECTION SYSTEM FOR NSW SELECTIVE SCHOOLS

Selective schools offer valued choice and excellent outcomes for gifted students and their families but the existing selection system is no longer fit for purpose. Designed for 12 fully selective high schools in 1991, it has stretched to accommodate 48 selective high schools and 76 primary schools with opportunity classes.

F1

F2

F6

**ENSURING THAT ENTRY TO SELECTIVE SCHOOLS IS BASED ON ABILITY, NOT BACKGROUND**

**OPTIMISING THE ASSESSMENT PROCESS TO ACCURATELY IDENTIFY STUDENTS' ABILITY**

**ADDRESSING THE GAPS IN A COMPLEX SYSTEM**

### WHY?

Students from disadvantaged groups face unintended barriers to entry

F3

Shortcomings in test design and inconsistencies in school assessment practices mean that the process may not identify all the students it is intended to

F4

As the selective education system has grown more complex over time, a number of gaps have emerged that constrain its effectiveness

F5

### ACTIONS

**ACTION 1:** Encourage more gifted students from under-represented groups to apply

**ACTION 2:** Ensure appropriate provisions and adjustments for gifted students with disability

**ACTION 3:** Make the selection process more relevant for gifted students from rural and remote areas, and the selective schools that target them

**ACTION 4:** Minimise imprecision to increase confidence in the accuracy of measurement

**ACTION 5:** Align the difficulty of the tests to the ability levels of the gifted students sitting them

**ACTION 6:** Update the frameworks used to guide test design and incorporate state-of-the-art assessment strategies

**ACTION 7:** Ensure mathematical and English ability are correctly weighted

**ACTION 8:** Reduce predictability and coachability, and support schools in preparing their students to sit the selection tests

**ACTION 9:** Partner with schools, families and communities to revise the School Assessment Score process

**ACTION 10:** Close the gender gap in the selection system

**ACTION 11:** Consider adjustments to the process of nominating school preferences

**ACTION 12:** Partner with schools, families and communities to review post-Year 7 entry to selective education

**ACTION 13:** Strengthen the department's ability to link data across the NSW education system and its responsiveness to emerging trends in selective education

### FINDINGS

**F1 FINDING 1:** Selective schools continue to offer valued choice for gifted students and their families

**F2 FINDING 2:** The existing selection process is no longer fit for purpose and needs updating for the coming decades

**F3 FINDING 3:** Students from disadvantaged groups face unintended barriers to entry in the selective education system

**F4 FINDING 4:** Shortcomings in the assessment process mean it is not capturing all students' true ability and so may not identify all the students it is intended to

**F5 FINDING 5:** A number of gaps in the selection system constrain its effectiveness

**F6 FINDING 6:** NSW selective schools need a world-class selection process

# 1. Delivering a modern, world-class selection system for NSW selective schools

Specialist programs for academically gifted students have been an integral part of public education in NSW for the past two centuries. Today, NSW selective schools continue to offer valued choice for gifted students and their families, delivering excellence in academic achievement and student wellbeing.

The selective education system has grown significantly over the last three decades. To ensure its selection process remains fit for purpose, the Department of Education has reviewed the methods used to place gifted students in selective schools.

## **NSW selective schools provide valued choice for families as part of a comprehensive, equitable public education school system**

Selective schools are valued for the many benefits they contribute to NSW education. They encourage and support high achievement for academically gifted students, creating a specialist school environment for advanced academic study. Families and community groups report that selective schools provide social and emotional benefits to gifted students, who have opportunities to flourish by learning alongside like-minded peers in a supportive environment that accepts and celebrates high ability. Finally, selective schools offer equity of access: they enrol students based on their ability, not their background.

## **The selection system must be updated if it is to meet the needs of tomorrow**

To ensure that the excellence of the selection system keeps pace with contemporary demands, the NSW Department of Education conducted a detailed review of the methods and processes used to identify and place gifted students in selective education. Its findings were generated from rigorous research, including independent expert review, quantitative data analysis, fieldwork in schools, stakeholder consultation, literature reviews of the latest scholarship, and comparative reviews of Australian and international practices.

The review revealed a selection process in need of modernisation and identified opportunities for improvement to guide the delivery of a world-class selection system for NSW selective schools. Designed in 1991 for 12 fully selective high schools, the selection process has stretched to accommodate 48 selective high schools, including fully and partially selective high schools, boarding schools, and a virtual school, and 76 primary schools with opportunity classes. The selection system today serves a more diverse range of students and schools spread more widely throughout the state, and needs to be updated to reflect this complexity.

**This report uses the term 'selective schools' to refer collectively to fully and partially selective high schools, and primary schools with opportunity classes.**

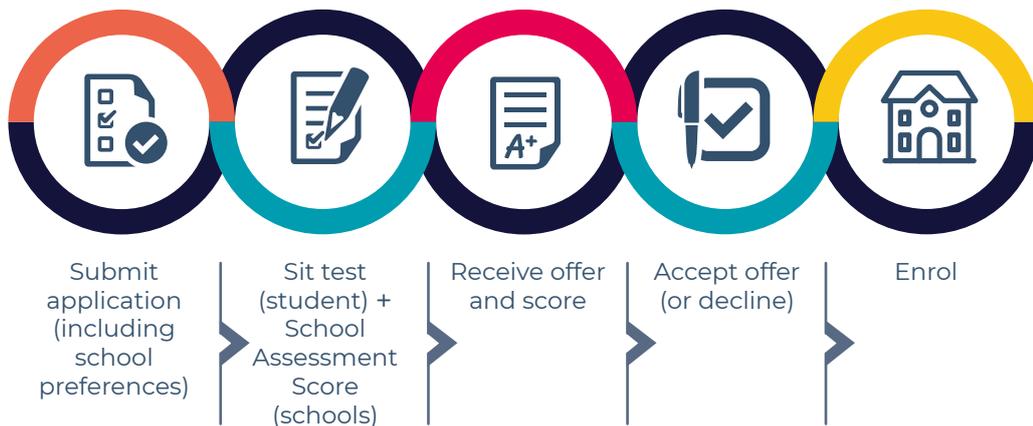
## Improvements to the selection process can make it better at identifying gifted students

Not all gifted students who could be accessing NSW selective schools are doing so. Many students of high ability are not applying to sit the selection tests. Often this is a deliberate choice by students and their families. But the review revealed that unintended barriers in the application process may be deterring some gifted students, including educationally disadvantaged students, Aboriginal students, students with disability, and rural and remote students (see Section 2).

It also found that shortcomings in the assessment process, including the test design and the school assessment component, contribute to a system that may not be identifying all the gifted students it is intended to find (see Section 3).

Finally, the review identified a number of gaps across the selection system. These included methods for entry to selective schools after Year 7, the process of nominating school preferences for placement, and departmental agility, responsiveness and data linkages. In particular, the review found a small but persistent gender gap in the applications, scores and composition of selective schools (see Section 4).

FIGURE 1:  
THE SELECTION  
PROCESS



**Based on these findings, the department will implement a range of improvements to the selection system. It will:**

Ensure that entry to selective schools is based on ability, not background	Optimise the assessment process to accurately identify students' ability	Address the gaps in a complex selection system
<p><b>Action 1:</b> Encourage more gifted students from under-represented groups to apply</p> <p><b>Action 2:</b> Ensure appropriate provisions and adjustments for gifted students with disability</p> <p><b>Action 3:</b> Make the selection process more relevant for gifted students from rural and remote areas, and the selective schools that target them</p>	<p><b>Action 4:</b> Minimise imprecision to increase confidence in the accuracy of measurement</p> <p><b>Action 5:</b> Align the difficulty of the tests to the ability levels of the gifted students sitting them</p> <p><b>Action 6:</b> Update the frameworks used to guide test design and incorporate state-of-the-art assessment strategies</p> <p><b>Action 7:</b> Ensure mathematical and English ability are correctly weighted</p> <p><b>Action 8:</b> Reduce predictability and coachability, and support schools in preparing their students to sit the selection tests</p> <p><b>Action 9:</b> Partner with schools, families and communities to revise the School Assessment Score process</p>	<p><b>Action 10:</b> Close the gender gap in the selection system</p> <p><b>Action 11:</b> Consider adjustments to the process of nominating school preferences</p> <p><b>Action 12:</b> Partner with schools, families and communities to review post-Year 7 entry to selective education</p> <p><b>Action 13:</b> Strengthen the department's ability to link data across the NSW education system and its responsiveness to emerging trends in selective education</p>

## 2. Ensuring that entry to selective schools is based on ability, not background

NSW selective schools are open to all gifted students: they enrol students based on their assessed ability, not their background. Selective schools provide specialist learning environments for advanced academic study within an equitable public school system.

Yet students from disadvantaged backgrounds remain under-represented in selective education. The review found that students from some groups may be deterred from applying by unintended barriers in the selection process, which the department can do more to overcome.

### Students from educationally disadvantaged backgrounds are under-represented

Students from families who have lower parental education levels are less likely to apply than those with higher parental education levels. They are also less likely to be offered a place in selective schools when they do apply. This means educational disadvantage is having a measurable impact

on whether some gifted students can access selective schools. Figures 2 and 3 show that more educationally advantaged students are over-represented at each stage of the selection process, while less educationally advantaged students are under-represented.

FIGURE 2:

**PARENTAL EDUCATION LEVELS OF STUDENTS AT EACH STEP IN THE HIGH SCHOOL SELECTION PROCESS**  
(STUDENTS FROM GOVERNMENT SCHOOLS ONLY, 2016)

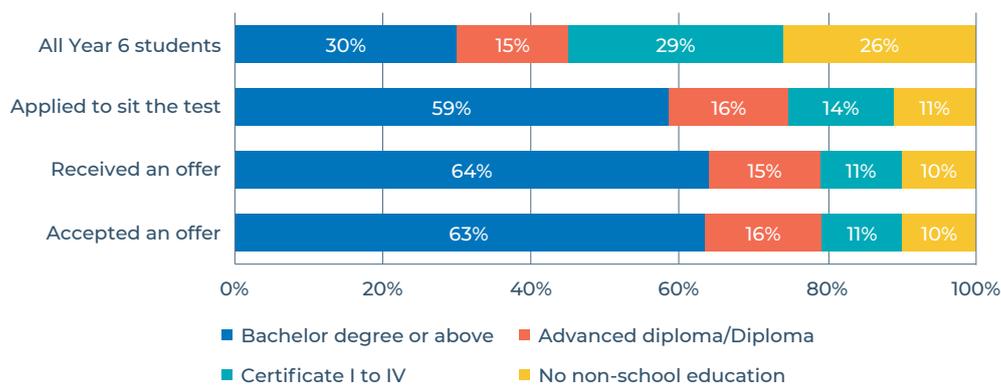
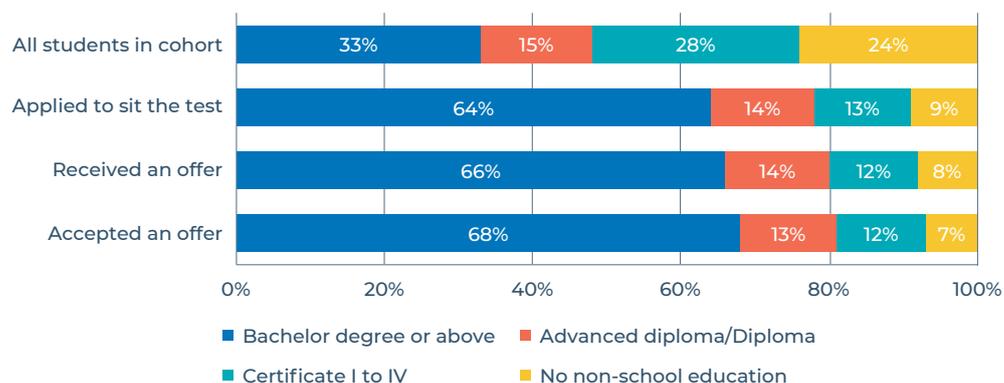


FIGURE 3:

**PARENTAL EDUCATION LEVELS OF STUDENTS AT EACH STEP IN THE OPPORTUNITY CLASS SELECTION PROCESS**  
(STUDENTS FROM GOVERNMENT SCHOOLS ONLY, 2016)

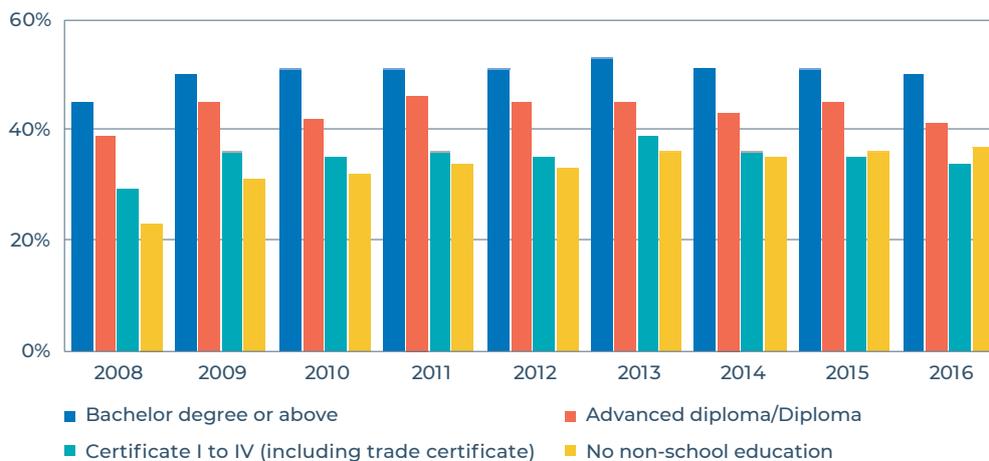


The creation of additional selective school places in 2009-10, through the expansion of partially selective high schools, is associated with improvement in the total number of students from low educational family backgrounds in selective education.

FIGURE 4:

**PERCENTAGE OF HIGH SCHOOL APPLICANTS WHO RECEIVED AN OFFER BY LEVEL OF PARENTAL EDUCATION, 2008-2016**

(STUDENTS FROM GOVERNMENT SCHOOLS ONLY)



### Indicators of educational disadvantage

Social advantage and disadvantage can affect student achievement. Researchers have shown that the cumulative effects of disadvantage mean fewer opportunities to learn. This in turn limits the academic achievement of bright but disadvantaged students. By contrast, educationally advantaged students tend to do better in school over time because they more often benefit from extra educational opportunities that flow from their family background. This is known as the 'excellence gap'.

There are several common ways of measuring educational disadvantage. In this report, we have used levels of post-school parental education. This indicator distinguishes four groupings ranging from least- to most-advantaged: no post-school education; vocational certificates; diplomas; and bachelor's degree or higher. The review chose this indicator because of its strong association with academic achievement. Analysis of parental occupation, which is also widely used to indicate disadvantage, returned very similar results.

Another common measure is the Index of Community Socio-Educational Advantage (ICSEA). While parental education measures student-level disadvantage, ICSEA is a school-level measure. This means it combines the average demographics of all students enrolled in one school, using a mix of direct measures (such as parental education and occupation) and indirect measures (such as average incomes for a suburb or area).

The Review of Selective Education Access needed a student-level measure of disadvantage because it analyses access by students. As a school-level measure, ICSEA was unsuitable. Another limitation of using ICSEA for our purposes is that it has been recalculated several times since 2008, which could result in misleading comparisons of change over time.

## Fewer Aboriginal students apply to selective high schools

The review found that very few Aboriginal students apply for selective education, although they are relatively successful in receiving an offer when they do. But the very low number of Aboriginal applicants makes it difficult to draw reliable conclusions about the merits and drawbacks of the current selection process for those students.

The department has used several different approaches to increase the rate of Aboriginal applications, including advertising and video

campaigns. Selection committees are able to give special consideration to Aboriginal and Torres Strait Islander students where their score falls close to a cut-off. Some Opportunity Classes and Selective High Schools have also trialled targeted Aboriginal student places, to encourage applications and retention.

The review's findings demonstrate the continuing need for more effective strategies to increase Aboriginal student application rates.

FIGURE 5A:  
APPLICATION GAP: AVERAGE PERCENTAGE OF STUDENTS WHO APPLY, 2008-2016  
(STUDENTS FROM GOVERNMENT SCHOOLS ONLY)

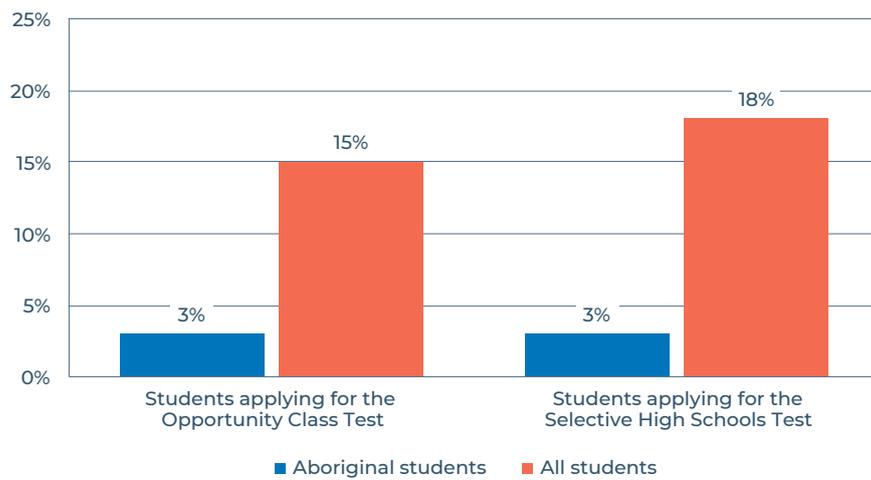


FIGURE 5B:  
PERCENTAGE OF APPLICANTS WHO RECEIVED AN OFFER FOR A SELECTIVE HIGH SCHOOL, 2008-2016  
(STUDENTS FROM GOVERNMENT SCHOOLS ONLY)

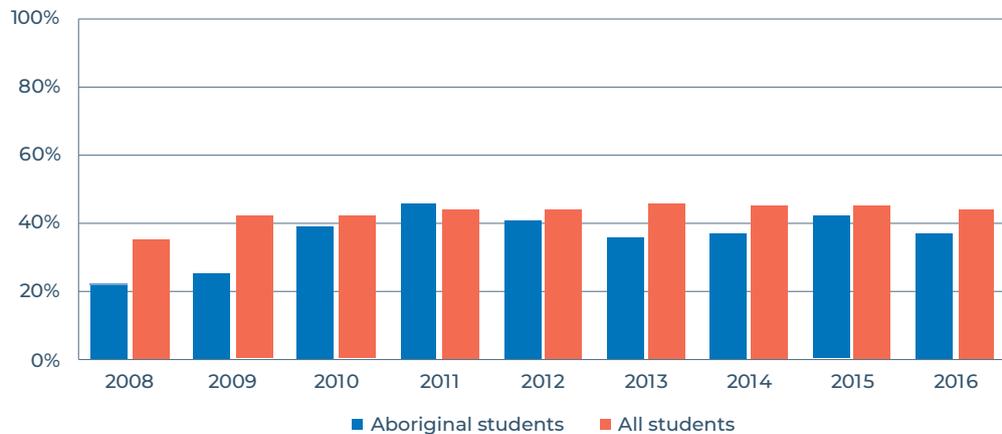
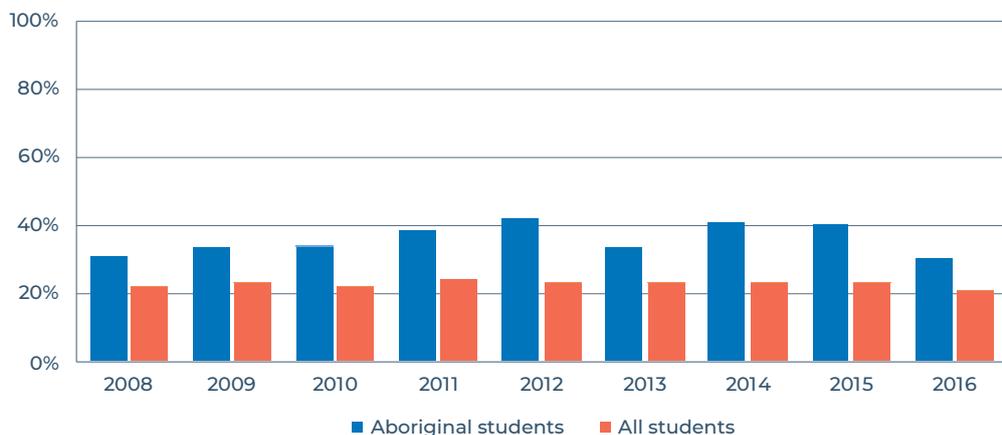


FIGURE 5C:  
PERCENTAGE OF APPLICANTS WHO RECEIVED AN OFFER FOR AN OPPORTUNITY CLASS, 2008-2016  
(STUDENTS FROM GOVERNMENT SCHOOLS ONLY)





## Action 1: Encourage more gifted students from under-represented groups to apply

While the causes and consequences of social inequality are much bigger than any selection system could address, the review identified opportunities to ensure that the department's commitment to equity in selective schools is reflected throughout the selection process.

Over the next three years, the department will introduce a series of measures to increase the application rates of students from disadvantaged groups. It will draw on behavioural research, analyse the experiences with equity measures

around the world, and learn from the expertise of schools, families and communities. Potential strategies to minimise inequities may include:

- Adjustments to the distribution of test sites and scheduling
- Equity access schemes, similar to those used in other jurisdictions
- School-level practices that may encourage applications

### Encouraging students from a wide variety of backgrounds to apply

Increasing the application rates of under-represented groups, particularly disadvantaged students, is a recognised strategy for improving equity, and supported by evaluations of similar schemes around the world.<sup>1</sup>

Within NSW selective education, high application rates from some students are associated with their greater representation in selective schools. These include educationally advantaged students with higher levels of parental education (see Figure 2).

Higher application rates are also seen among students from some language backgrounds. On average, in the years 2011-2016, 18% of students enrolled in government schools applied to sit the Selective High Schools Test. For students from some language groups, that figure was very much higher, including eastern Asian languages (70% of students apply), southern Asian languages (61% apply), and southeast Asian languages (37% apply).<sup>2</sup>



## Action 2: Ensure appropriate provisions and adjustments for gifted students with disability

Gifted students with disability can face challenges in the test or school assessment process which make it harder to accurately assess their full potential. Extra test adjustments or additional score consideration for these students can help ensure a fair selection process.

In order for gifted students with disability to participate in selective education on the same basis as other gifted students, the selection process must be able to accommodate appropriate adjustments and considerations, tailored to specific student needs. The review found that some current disability provisions are unsuitable. This may deter gifted students with disability from applying, and hinder them once they do.

The review received substantial stakeholder feedback about the need to improve disability provisions. Problems reported include the rigid test requirements, difficulties posed by unfamiliar test site locations, the paper-only test format, an arduous process to apply for disability provisions, and the inadequacy or unsuitability of adjustments for certain types of disability.

The department will make immediate improvements to ensure reasonable adjustments are made for students with disability who apply for entry to selective schools. The department will continue to work with disability advocates, schools and families to monitor the appropriateness of these adjustments, and to inform the design and implementation of new selection tests from 2020.



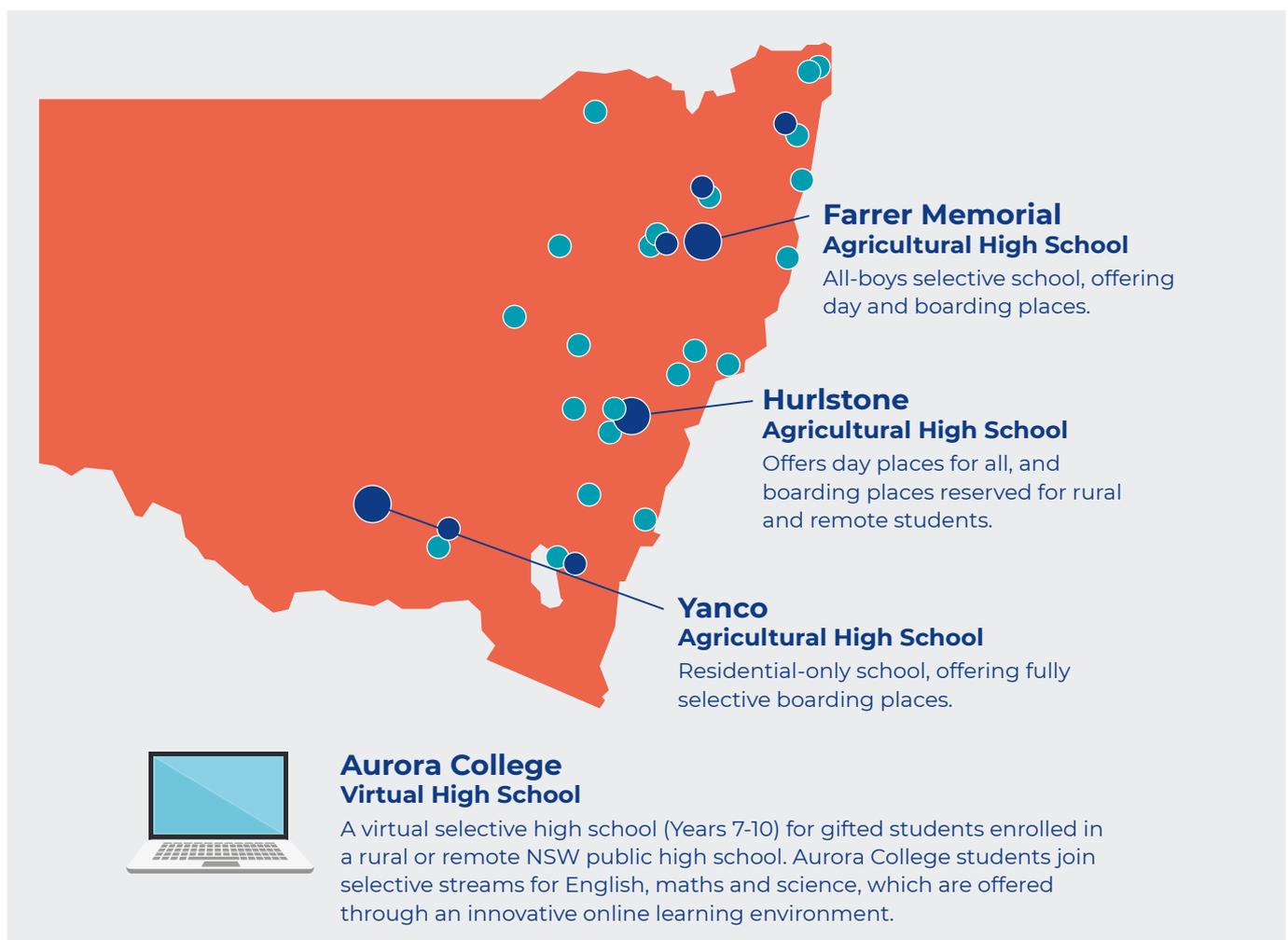
### Action 3: Make the selection process more relevant for gifted students from rural and remote areas, and the selective schools that target them

Gifted students from rural or remote areas of NSW can face disadvantages due to their geographic isolation. The NSW selective system offers options designed to help overcome this disadvantage. Figure 6 shows the geographic distribution of selective schools serving students from rural and remote areas. Three Selective High Schools with boarding places and one virtual selective school are designed specifically to accommodate students from geographically isolated areas.

Since 2010, more selective schools have been established in areas outside Sydney, Wollongong and Newcastle, which has created new opportunities for gifted students outside major cities.

FIGURE 6:

SELECTIVE SCHOOLS SERVING GIFTED STUDENTS OUTSIDE MAJOR CITIES



- Primary schools with Opportunity Classes
- Selective High Schools

The review found that the one-size-fits-all centralised selection process does not meet all the needs of these schools, for three reasons:

1. Farrer, Hurlstone and Yanco have a specialist agricultural curriculum, but the centralised selection process is not well-suited to assessing applicants' interest in or aptitude for agricultural study. Some principals, families and communities suggested that the selection process could be improved by including an optional component designed for these schools, such as an interview or portfolio-based assessment.
2. Selective schools offering boarding places have distinctive needs. Some principals highlighted the value of the interview component commonly used for post-Year 7 entry to these schools, which helps to identify gifted students with the resilience and social skills to thrive in a boarding environment.

3. Families in rural and remote areas with multiple gifted children may face additional problems with placement. In the current system, siblings can only be offered a place in the same selective school based solely on their profile score. This means that siblings with similar levels of giftedness may nevertheless be placed in different schools because preferences and cut-off scores can shift across intake years. In turn, this can deter families from accepting a selective school offer. Prior to 2013, siblings could receive placement consideration. An unintentional consequence of the change has been to reduce the incentives for rural boarding placement.

The department will work with schools, families and communities to identify system improvements that help gifted students from rural and remote areas to overcome these unintentional barriers, including potential adjustments to the assessment process so it better meets the needs of regional and boarding schools. The expansion of the award-winning Aurora College into Years 11 and 12, as well as its trial of Opportunity Classes in 2019, will offer new opportunities to directly assist gifted students in rural and remote areas.

### 3. Optimising the assessment process to accurately identify students' ability

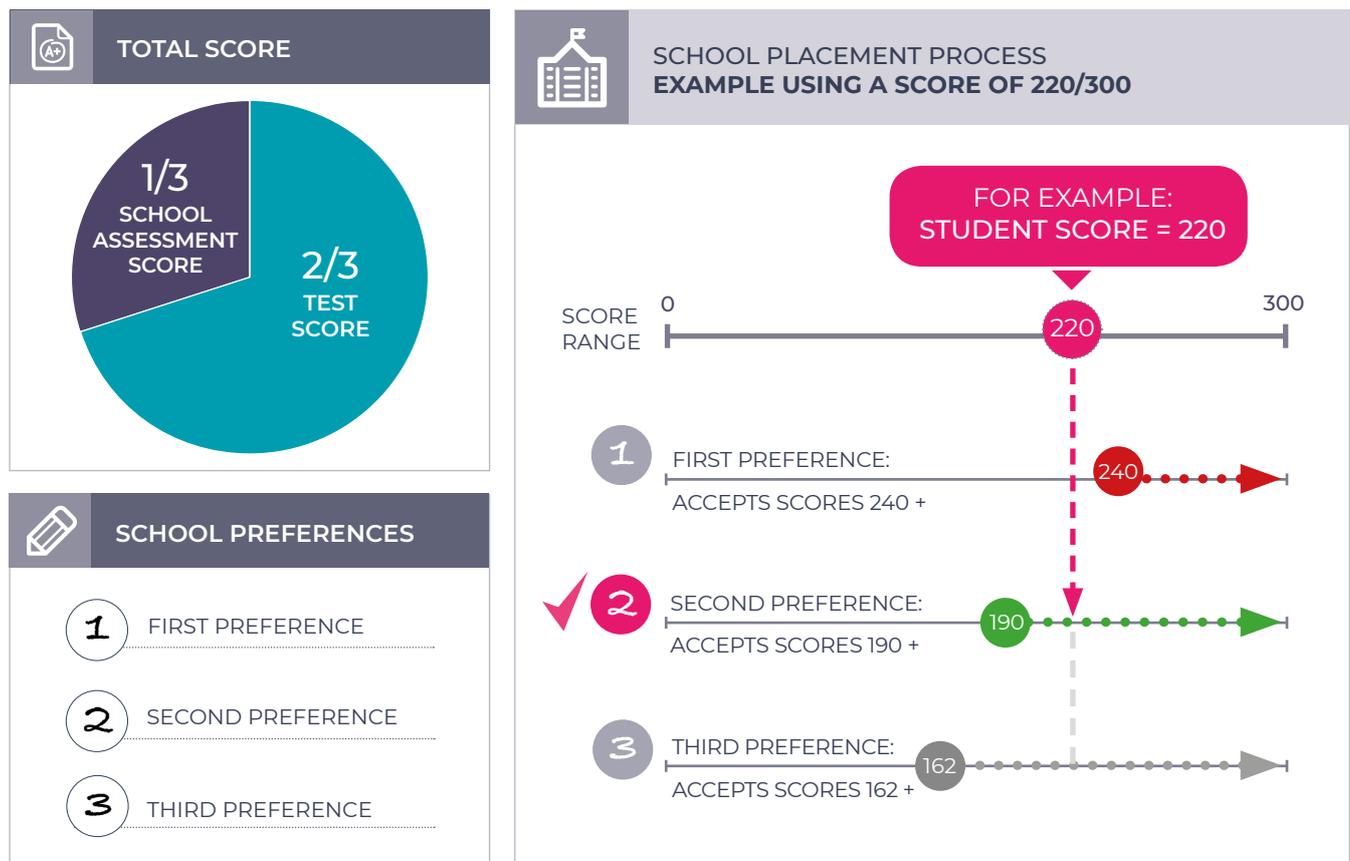
To deliver a world-class selection system capable of meeting the needs of NSW selective education into the future, the department will introduce a number of improvements to its selection process. First, it will modernise the selection tests by reflecting best practice in high-stakes assessment and ensuring they are tailored to the abilities of NSW's gifted students. Second, it will engage with schools, families and their communities to examine the school assessment component of the selection process and ensure it is similarly fit for purpose.

#### A snapshot of the assessment process

The score used to place students in selective schools is composed of a test score (two-thirds) and a School Assessment Score (one-third). Identifying ability is a valuable predictor of a student's suitability to work at the more advanced academic level offered in selective schools.

Distinguishing ability from on-the-day performance is a difficult but essential challenge for a high-quality selection process. At present, the selection test is designed to assess ability, while the school assessment score is often a measure of aggregate student performance over the previous year.

FIGURE 7:  
PLACEMENT PROCESS FOR SELECTIVE HIGH SCHOOLS



## Selection Tests: Improving precision to more accurately identify the abilities of gifted students

Psychometric tests are the centrepiece of the current assessment and selection processes for selective education in NSW. Both the Selective High Schools Test and the Opportunity Class Test ('selection tests') assess candidates' aptitude in maths, reading and general ability. The Selective High Schools Test also has a writing component. A student's test score is combined with his or her School Assessment Score to produce a scaled profile score, which forms the basis of placement decisions.

The selection tests are designed to assess *ability* (that is, potential), rather than the level at which students are currently *performing*. In this sense, their purpose is fundamentally different to other school-based tests such as NAPLAN or the HSC.

The department commissioned two expert, independent reviews of the selection tests and the strength of their psychometric properties. A team of independent psychometricians analysed test data, including all student responses, for the selection tests from 2008-2016. The department also conducted its own analysis and verification, and commissioned a third independent expert to verify these findings.

### Overall findings

The review revealed several limitations in the design of selection tests, given their intended purpose. These tests are used to inform high-stakes decision-making, where small differences in a student's score could mean that they are offered a place in their preferred school – or are not. While the selection tests are generally sound, aspects of their psychometric design mean that they are not precise enough to meet the demands of the NSW selective education system.



## Action 4: Minimise imprecision to increase confidence in the accuracy of measurement

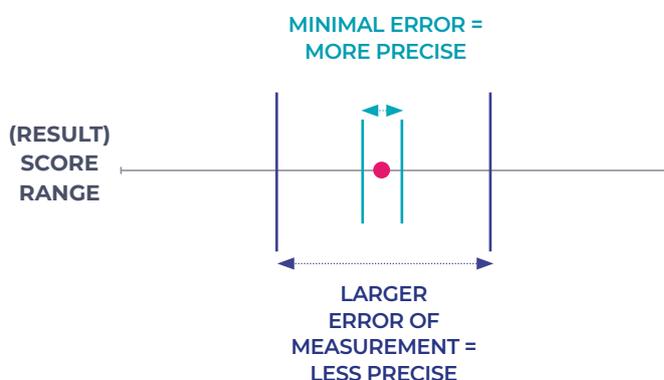
The NSW selection system assesses students of very similar, very high ability. The selection tests therefore need to deliver confidence that students' ability is being measured as accurately as possible.

Psychometric analysis uses the term "standard error of measurement" to refer to statistical estimates of how precisely a test measures ability. All tests have some measurement error: test scores can only estimate (never perfectly reflect) a student's ability. To meet the needs of the NSW selective system, however, the review found that the selection tests should have a smaller standard error of measurement in order to increase confidence that they can measure ability with greater accuracy.

The department has made improvements to the 2019 tests, including revising their difficulty targets. From 2020, the department will fully revise the frameworks used to guide test design to ensure selection tests meet their stated purpose, and procure a new test designed to the highest international standards for precision and accuracy.

The review's analysis identified two areas for specific attention in a redesigned test: difficulty targeting (Action 5) and reliability (Action 6).

FIGURE 8:  
PRECISION AND MEASUREMENT ERROR





## Action 5: Align the difficulty of the tests to the ability levels of the gifted students sitting them

The review revealed that the Selective High Schools Tests are not difficult enough for the cohort of students sitting them. Test difficulty needs to be better targeted to the ability levels of candidates.

Test 'targeting' refers to the process of matching the difficulty of a test to the ability of candidates. In a well-targeted test, the difficulty range of questions would match the ability range of the students being assessed. A well-targeted test of appropriate difficulty is able to distinguish more reliably between candidate ability. Too many questions that are too easy (i.e. very few candidates answer incorrectly) or too hard (i.e. very few answer correctly) don't provide useful information about different ability levels. It is particularly important that the selection tests can provide reliable information about ability levels close to the cut-off scores used to place students in NSW selective schools.

Analysis revealed that Selective High Schools Tests routinely target an easier level than they should for this cohort of students, and did not include enough difficult items to distinguish effectively among students of highest ability. Not enough questions targeted the upper levels of student ability, particularly in the reading tests. More difficult questions were more likely to feature in the maths and general ability tests.

Low targeting is a problem because it means that decisions based on placement scores at the higher end of the scale are effectively determined by a very small number of items, largely from the maths and general ability tests. This creates a greater chance for measurement imprecision.



## Action 6: Update the frameworks used to guide test design and incorporate state-of-the-art assessment strategies

Selecting students for a limited number of selective school places means the department needs assessment methods that are as precise and reliable as possible. The review found that selection tests could be improved by incorporating modern test design strategies, which can provide more reliable information about student ability. This could include using a tailored test design, which automatically adapts to a student's test performance and asks questions that match the student's ability level.

The review also found that the tests could be made more reliable to better support the high-stakes selection process in NSW. A test's *internal reliability* measures the extent to which different items on the test that are designed to measure the same type of ability actually produce similar scores.

For example, all the questions in an English test designed to assess spelling ability should return similar results, as should all the questions designed to assess vocabulary. A test in which a student returns inconsistent scores for items designed to measure the same thing would reveal unreliable information about that student's true ability.

Recent advances in assessment technology and research have provided new options for improved tests. For example, NAPLAN is moving to an online 'tailored test' model to provide better accuracy and student engagement. More modern assessment formats such as this will provide greater confidence in the precision of student test results, which will provide a fairer and more accurate picture of student ability.



## Action 7: Ensure mathematical and English ability are correctly weighted

The review's analysis revealed that the tests are unintentionally weighted towards ability in maths over English.

Examining correlation in the scores for questions that assess different types of ability can be instructive. Some correlation is good: many students do equally well in maths, English and general ability. But too much correlation between some items and not others indicates that a test may be skewed towards some abilities.

Analysis of the Selective High Schools Test found a high correlation between the maths and general ability tests – together worth 50% of the overall placement score. This suggests an over-weighting of mathematical ability. This could occur if, for example, too many numerical reasoning questions were included in the general ability test. Maths also appears to be over-weighted in the School Assessment Score.

Analysis of the Opportunity Class Tests revealed even higher correlation between maths and general ability.

This over-weighting of mathematical ability may be a cause of a gender gap in profile scores (see Section 4). Analysis of the test results shows that, on average, boys achieved slightly better results in maths and general ability, while girls achieved slightly better in reading and writing. But the over-weighting of maths means that boys' overall scores remain slightly higher.

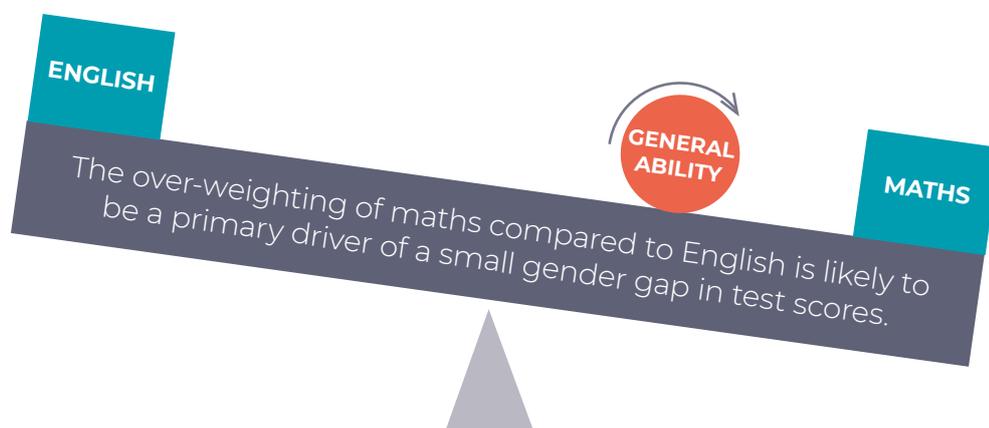
The test data reflect the achievement pattern evident in the broader student population – for example, boys score slightly higher in maths while girls score slightly higher in English in NAPLAN at this educational stage. There is no evidence that boys are better at maths or girls are better at English, but this is a common belief in society. As a result of this belief children are often encouraged more in one subject than the other, depending on their gender.

There are likely to be other factors contributing to the gender gap in selective schools, including student and family preferences (reflected in school nomination ranking and decisions to decline offers), and slightly lower application rates for girls. The department will further investigate these patterns to identify their causes.

Rectifying the unintentional over-weighting of maths in the selection tests is expected to be an important action to close the gender gap in results.

FIGURE 9:

### UNINTENTIONAL OVERWEIGHTING OF MATHS IN SELECTION TESTS





## Action 8: Reduce predictability and coachability, and support schools in preparing their students to sit the selection tests

Several elements of the tests' design and structure can make them more predictable. Predictability is a problem because it increases the likelihood that test scores reflect on-the-day performance rather than true ability. Prediction can also make the tests more 'coachable'. While there is little evidence that coaching substantially improves test scores, it is more likely to do so where the test's format and question types are more predictable.

The department has maintained a consistent test structure each year. This is to some extent a strength of the current system, because it allows results to be compared year-to-year. Consistency also helps students feel more comfortable about what will be expected of them during the test itself. But maintaining the same test format and range of questions can also make tests easier to predict and practise. While repeat questions are avoided and the type of questions are varied, there is nevertheless a limit to the types of psychometric multiple choice questions that can be asked without changing the test format itself.

The tests may also be made more predictable by other shortcomings. Not having enough difficult items (see Action 5) means that high scores can be achieved by correctly answering moderately difficult questions with great consistency – which can result from preparation and practice. This makes it difficult to differentiate between students of very high ability (who would be able to answer correctly questions of higher difficulty) and those with high ability who are proficient at test-taking. This can expose the selection system to coachability.

## Test preparation and coaching

It is difficult to find evidence that coaching helps students achieve higher test scores. Assessing whether coaching has an impact would require test-takers to be asked whether they had participated in coaching, which does not currently occur. In addition, this kind of self-reported data is often unreliable, because it is difficult to ensure the same definition of 'coaching', and may not accurately capture the differences in preparation programs. Research on coaching in other countries suggests that commercial test preparation programs may have a small positive effect on test scores, but these are findings from different populations, different assessments, and different educational systems and so they might not hold true in NSW.<sup>3</sup>

During their fieldwork visits to schools, the review's researchers gained insights into the experiences of students and families with coaching. (Coaching can be defined as a deliberate practice course specifically aimed at improving performance on a fixed outcome, such as a test.) These insights are reported below.

1. Students in schools in outer suburban and regional areas reported less use of coaching than those in suburban and inner-city areas.
2. Of the selective school students researchers spoke to, some had used coaching and some had not. Students who discussed their coaching experiences expressed confidence in their test-taking skills and could identify strategies to manage time and interpret questions. They also reported that they were rarely surprised by test questions.

By contrast, students who hadn't engaged in coaching or had other test preparation assistance reported that they were often surprised by questions and the test format, ran out of time, and struggled to understand questions.

3. School preparation for the selection tests varied widely. Some schools offered practice tests, preparatory information sessions or skills workshops. Some students had 'ad hoc' conversations with their teachers, downloaded practice tests from the department's website or purchased practice books. Some students reported receiving advice from family and friends. Some students had not engaged in any test preparation.

4. Patterns of coaching use varied widely, ranging from some students who reported enrolment in coaching as early as Year 1 to others who participated only in short-term preparation courses just prior to the selection tests. Frequency and intensity ranged from 1-2 hours per week to sessions on 4-5 days per week, or longer sessions of 3-5 hours. School holiday sessions or camps of 4-8 hours per day were also reported.
5. Some students discussed the social benefits and enjoyment of attending academic coaching with their friends and like-minded students, similar to those observed in other extra-curricular activities or after-school care programs.

The motivations for families to engage in coaching also varied. Common reasons given to the review included:

We think coaching works and is necessary to do well

We like the feedback and teaching strategies offered by coaching services, especially regarding test preparation

Attending after-school extra-curricular academic programs is a cultural expectation or norm

Because of language barriers, unfamiliar curriculum and scarce time, coaching gives our children help that other parents can provide because of better English language proficiency or greater familiarity with NSW education

### The department is committed to:

- continuing to ensure that coaching is not required for entry to NSW selective schools
- investigating ways to help all students feel ready and prepared to do their best in the selection test, such as improving communication to applicants about what to expect
- reducing the potential for predictability and coachability in the test design (see Action 8).

## School Assessment Scores: addressing inconsistencies

One-third of a student's profile score is contributed by the School Assessment Score in English and maths, developed by the student's current school. Methods used to determine the score are not the same at every school, which introduces inconsistencies into the selection process and can mean substantial additional work for some schools.

The School Assessment Score is a measure of a student's achievement in maths and English, relative to their classmates, over the previous year. Whereas the selection tests assess student *ability*, the School Assessment Scores more often measure student *performance* over time. These scores are then centrally moderated, so that the scores of one school can be compared with those of another.

School practices vary significantly. While the department provides advice to schools about ways to develop the scores, the methods used are ultimately a matter of school discretion. Typically, schools with few applicants tend to use marks from regular class assessment or report grades. Schools with many applicants tend to employ more extensive assessment practices; in some cases, these included commercial psychometric tests.



### Action 9: Partner with schools, families and communities to revise the School Assessment Score process

Community views about the School Assessment Scores also varied. Many groups reported to the review that they value the inclusion of school-based assessments in the selection process. Parent and community groups in particular favoured a system that is not solely reliant on a student's test-day performance, but rather takes into account a broader reflection of student achievement over time. Yet they also acknowledged the considerable variation in this process, which may create inequities that disadvantage some students. Some stakeholder groups also noted that a problem with the School Assessment Score is its reflection of aggregate performance, rather than ability.

Further inconsistency arises because only government primary schools are required to provide School Assessment Scores;

non-government schools are not required to do so (and many do not). This means that some applicants from non-government schools (approximately 13% of the total) are assessed solely by the selection test, whereas for students from government schools it contributes only two-thirds of their score. That is, students from different educational systems enter the same selective education setting in different ways.

The department will work with schools, families and communities to consider reforms to the School Assessment Score component of the selection process. The combination of test improvements and School Assessment Score reforms will be crucial to delivering a world-class selection system for NSW.

## 4. Addressing the gaps in a complex system

As the selective education system has grown more complex over time, a number of gaps have emerged that demand attention. Specifically:

- A gender gap is evident throughout the selection system: fewer girls apply, fewer are successful in receiving an offer from their first-preference school, and fewer girls accept an offered place
- Post-Year 7 entry to selective education is characterised by inconsistencies, potential inequities and high workloads for schools
- The process for nominating school preferences is often misunderstood
- The department's practices need continuous monitoring and improvement in order to support a world-class selection system

The department will remedy these system-wide problems to ensure that selective education operates at a level of excellence to match community expectations. It will close the gender gap, consider adjustments to the processes of post-Year 7 entry and nominating school preferences, and ensure the selection system is monitored for continuous improvement by an agile, responsive department.

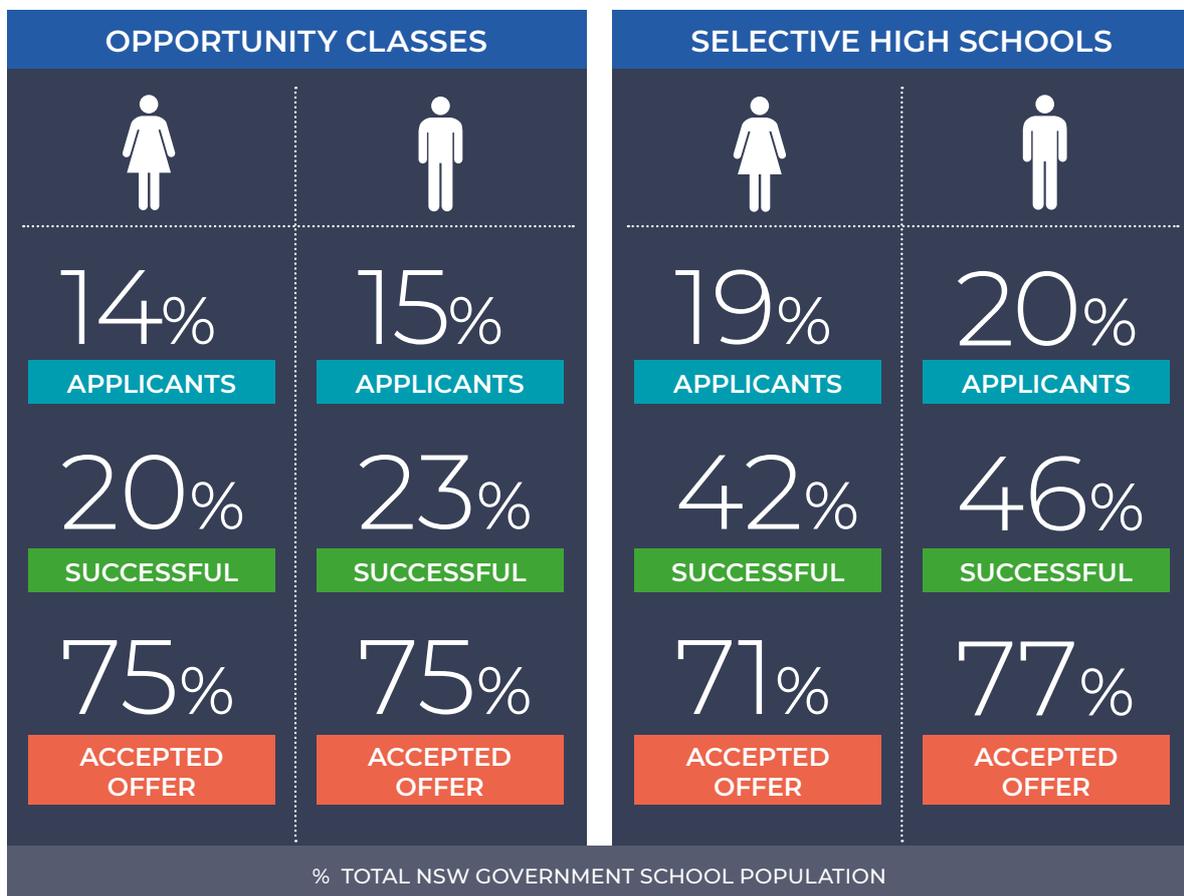


### Action 10: Closing the gender gap in the selection system

There are more boys than girls in NSW selective education. After accounting for the slightly higher proportion of boys in public education (51% boys, 49% girls), a gender gap is evident throughout

the selection system: fewer girls apply, fewer are successful in receiving an offer from their first-preference school, and fewer girls accept an offered place.

FIGURE 10: THE GENDER GAP IN THE SELECTION SYSTEM





## Action 10: Closing the gender gap in the selection system continued

FIGURE 11:

GENDER COMPOSITION, YEAR 7 (2017)

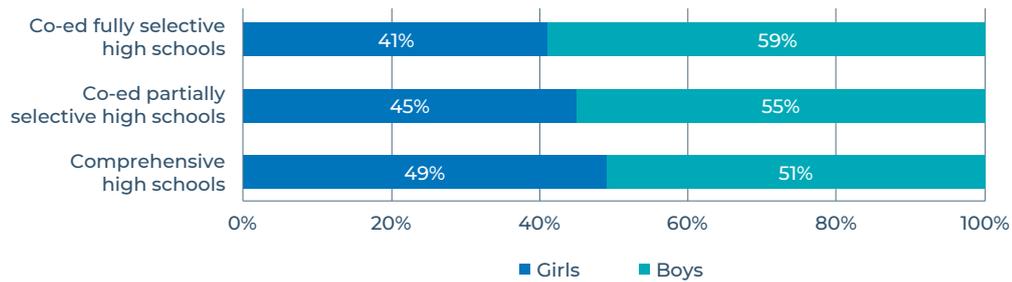
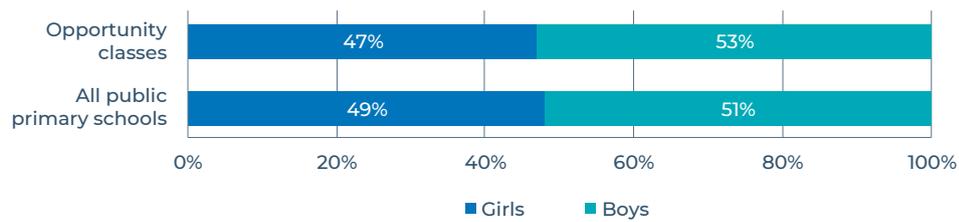


FIGURE 12:

GENDER COMPOSITION, YEAR 5 (2017)



Having identified the scope of this gender gap, the department will investigate its causes. There are several factors that could be contributing in combination:

1. There are 140 (~3%) more places available in all-boys selective schools than in all-girls selective schools. Although most single-sex selective schools have a 'brother' or 'sister' school with equal numbers of places, there are two exceptions. The first is a regional boys-only selective high school, which does not have an equivalent sister school. It offers 44 selective places for day students, and an additional 66 selective places for boarding students. The second is a fully selective boys-only school, which offers 30 more places in Year 7 than its sister school.
2. Boys achieve slightly higher profile scores than girls. The difference is small – an average difference of 2.26 profile points out of 300, or approximately 0.75% – but given the competition for places, this may be enough to tip the scales. The department is investigating the causes of this difference, but it is likely that the weighting of maths over English ability is a significant contributor (see Section 3).

3. It is possible that families of girls may more often prefer single-sex schools, while families of boys may more often prefer co-educational schools. This preference is supported by the review's analysis, which showed that girls nominate single-sex schools at higher rates than boys. This preference may be responsible for the higher rates of girls declining offers, perhaps motivated instead to enrol in all-girls schools in the comprehensive public system or the private system.

As an immediate response, the department has adjusted the test design process for 2019 to reduce gender effects in the assessment process. Remedying the unintentional weighting of maths ability over English is an important step. The 2019 results will be closely scrutinised and inform continuous improvements to test design in 2020 and beyond.

The department will also continue its investigation into the reasons for girls' under-representation in selective education. The department will share its findings and partner with schools, families, communities and experts to continue closing the gender gap in selective schools.



## Action 11: Consider adjustments to the process of nominating school preferences

Offers of enrolment in selective schools are based not only on a student's profile score (test score + School Assessment Score), but also on his or her nominated school preferences. When students apply to sit the Selective High Schools or Opportunity Class tests, they are actually applying to up to three schools, which they nominate in order of choice (see Figure 7).

The review found that the process of school nomination and placement is often confusing for students and their families. Some mistakenly believe that each school sets its own cut-off score, and/or that the score reflects the excellence of its learning environment. In fact, the cut-off scores for each school are based solely on *demand* for places each year. Cut-off scores *do not* reflect the learning capacities required for a school's educational

program. Yet student choices may be influenced by the published cut-off scores from the previous year.

Students list their school preferences *before* they know their profile score. This means that a student could score highly enough for entry into many selective schools, but not be offered a place because they nominated only schools with very high demand (and therefore very high cut-off scores).

To ensure that students and their families are able to make informed choices in nominating schools, the department will improve its communications about the process. The department will also investigate adjustments to the sequencing of nomination by working with families to better understand their preferences.



## Action 12: Partner with schools, families and communities to review post-Year 7 entry to selective education

The review found fairly high rates of students moving between selective high schools after their enrolment. A larger proportion of students initially enrolled in partially selective schools changed schools by Year 12 (21%) than those enrolled in fully selective schools (6%), or those who were unsuccessful in gaining an offer and enrolled in a comprehensive public school (18%).

The majority of movement from partially selective schools was into fully selective schools (63%). One plausible driver of mobility is the regular intakes of additional Year 9 and/or Year 11 classes in several fully selective schools. These post-Year 7 vacancies can ripple through the system, creating patterns of 'school-hopping' to fill flow-on vacancies. Another possible cause relates to perceptions that the cut-off scores for Year 7 entry reflect school 'quality' (rather than simply preferred demand), which may exacerbate this pattern as students seek to 'upgrade' to a school with a higher cut-off.

The practices used by schools to select students for enrolment in Years 8-11 vary. Following an internal departmental review in 2013, each school manages its own applications, selections and appeals for Years 8-11. For schools in high demand, this can

impose substantial workload burdens. Some selective high schools charge an application fee (typically between \$40 and \$150) to cover costs of purchasing externally-provided tests. All schools contacted indicated their readiness to waive fees for students experiencing financial difficulty. Nevertheless, fees may deter students from disadvantaged backgrounds.

Despite these drawbacks, principals also reported that the ability to tailor post-Year 7 selection processes to the needs of each school is a strength of the current approach.

The department will work with schools to identify avoidable drivers of post-Year 7 mobility. It will develop adjustments that balance the advantages of streamlined entry and equity considerations, on the one hand, and the flexibility to tailor admissions to a specific school context, on the other. A starting point is the collaborative model used by a group of selective schools in metropolitan Sydney to create a single entry point for applicants, who list three preferred schools from the group and sit one ability test as part of the process.



## Action 13: Strengthen the department's ability to link data across the NSW education system and its responsiveness to emerging trends in selective education

Delivering a modern, world-class selection system for NSW selective schools requires world-class departmental support. As the department modernises the selection process, it will ensure that its own capabilities keep pace. This will involve new work to link the selection system with the

broader data transformation occurring throughout the department. These data linkages will help deliver continuous monitoring and improvement of the selection system, and enable information generated through the selection process to benefit the larger public school system.

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### Endnotes

- 1 See Card, D. and Giuliano, L. 2016, 'Universal screening increases the representation of low-income and minority students in gifted education', *Proceedings of the National Academy of Sciences*, vol. 113, no. 48, pp. 13678-13683; and McBee, M. 2006, 'A descriptive analysis of referral sources for gifted identification screening by race and socioeconomic status', *Journal of Secondary Gifted Education*, vol. 17, pp. 103-111.
- 2 The department uses the Australian Standard Classification of Languages (ASCL) developed by the Australian Bureau of Statistics when analysing language data.
- 3 An example of this is a US study of students who completed the Khan Academy SAT (college entry test) preparation course, which found they scored 2% higher than those who did not.

# Review Methodology

The Secretary of the New South Wales Department of Education, Mark Scott AO, in July 2017 announced a review into the methods and processes used to assess students for selective education in New South Wales Public Schools.

The research project was led by a team from the department's Centre for Education Statistics and Evaluation (CESE), who partnered with Learning and Business Systems Directorate for the review.

Six research streams were used to consider different angles of this review:

- Psychometric review
- Educational review
- Stakeholder consultation
- Fieldwork in schools
- Exploratory quantitative data analysis
- Review of research literature, as well as Australian and international practices.

The research streams were combined to contribute to the review's overall findings. Multiple lines of enquiry helped to triangulate findings for the research questions.

## Psychometric review

A comprehensive psychometric review of the Selective High Schools Test and Opportunity Class Test was undertaken by a team led by Emeritus Professor Patrick Griffin (University of Melbourne). In order to guarantee rigour and independence, the department sought a research team external not only to the department but also to the NSW context. The psychometric review analysed nine years of test data. This included all student responses for the Selective High Schools Test and Opportunity Class Test from the 2008 test year (for 2009 school year entry) through to the 2016 test year (for 2017 school year entry). Analyses of psychometric and metric properties helped the research teams to understand the patterns of student responses to questions over the nine-year window.

## Educational process review

This research stream drew on international expertise in assessment and identification of gifted students. Associate Professor Scott J. Peters (University of Wisconsin-Whitewater) advised the department's research teams on angles of enquiry and research methods. This research stream focused on the equity of the selection system, from application to placement.

## Research validation and review

Additional input was received from Associate Professor David Curtis (Flinders University, South Australia). Professor Curtis reviewed the research processes and findings of each project component. The research and reporting team worked with Professor Curtis to interpret findings and formulate future actions.

## Stakeholder consultation

The department's research working group undertook a series of consultation sessions with key professional and community stakeholder groups. These meetings were held from May to August 2018. Stakeholder group representatives were asked to share their perspectives on the current application, assessment and placement processes. Additional consultation in this area was carried out for the department's review of the gifted education policy. These consultation sessions were held in February and March 2017 and again in March and April 2018.

## Fieldwork in schools

The research working group also conducted school-based fieldwork. Fieldwork helped the research team hear from students, teachers, principals and families about their experiences and perspectives on the process. Schools from a broad range of geographic and socio-economic areas were visited and contacted to ensure that a diversity of perspectives were captured. The department's research working group met with groups of principals and teachers to discuss school practices and their perspectives on the issues listed in the review's scope and terms of reference. The research working group also met with groups of students who had sat the tests in recent years.

## **Exploratory quantitative data analyses**

A data analysis project helped the review understand patterns and changes in application and enrolment over the past ten years. The research team analysed patterns in application, assessment, acceptance, and enrolment for students in selective schools. An advanced data matching and linkage project meant that students placed in selective classes in partially selective high schools and opportunity classes could be analysed separately for the first time.

## **Analysis of Australian and international research and practices**

The review examined current best practices in assessing the ability of gifted students, reviewing Australian and international research and practices. The research teams contacted department representatives and principals from selective schools in other Australian states. An analysis of interstate and international practices and processes helped the team understand options that currently exist in comparable Australian schools or other school systems. Insights from interstate teachers and principals helped the teams gain an understanding of the strengths and weaknesses of different application and assessment methods.

# Independent reviewers

Three external research teams contributed to this review. They provided independence and expertise, and captured Australian and international perspectives and experience. The department's review team worked with these reviewers to help develop the findings and actions in this report.

## **Emeritus Professor Patrick Griffin**

Emeritus Professor Griffin led an external independent psychometric analysis of existing assessments used for selective schools in NSW public schools. This included a full data analysis and review of ten years of student test and achievement data.

Professor Griffin is the founding director of the Assessment Research Centre, and has been the Chair of Education (Assessment) and the Associate Dean (Strategic Projects) at the Melbourne Graduate School of Education. He is a member of the National Expert Advisory group for NAPLAN tests and sits on a Ministerial advisory committee for Student Wellbeing.

Professor Griffin is a John Smythe medallist, a prestigious international award that was presented in recognition of excellence in educational research. His work on profiling literacy development has been recognised by the American Society for Curriculum Development as world-best practice. He has led project teams for UNESCO in developing economies and is a recipient of the UNESCO Research Medal for his work in southern Africa. Professor Griffin has also worked with the World Bank on education development projects in Vietnam and China.

## **Associate Professor Scott J. Peters**

Scott J. Peters is an Associate Professor of Educational Foundations and the Richard and Veronica Telfer Endowed Faculty Fellow of Education at the University of Wisconsin-Whitewater. His team provided an external independent review of the educational elements of the current assessment, selection, and placement process for selective education settings. He advised on research and models of practice to inform the development of future assessment and selection processes.

Professor Peters is the recipient of the Feldhusen Doctoral Fellowship in Gifted Education, the NAGC Research an Evaluation Network Dissertation Award, the NAGC Doctoral Student of the Year Award, the NAGC Early Scholar Award, the NAGC Paper of the Year Award, the NAGC Book of the Year Award, and the UW-Whitewater Innovation and Outstanding Research Awards.

He has served as the Program Chair of the American Education Research Association Research on Giftedness, Creativity, and Talent Special Interest Group, on the Board of the Wisconsin Association for Talented and Gifted, and as the National Association for Gifted Children Research and Evaluation Secretary.

## **Associate Professor David Curtis**

David Curtis is an Associate Professor in the College of Education, Psychology, and Social Work at Flinders University in Adelaide. Professor Curtis undertook a review and validation of analyses completed in this project.

Professor Curtis has worked in the higher education sector for 25 years. He then spent 10 years as a senior research fellow working for the Australian Council for Educational Research, the National Centre for Vocational Education Research and as a consultant before returning to higher education.