

CALCULATING OPS: THE BASIC PRINCIPLES

*For distribution to
Years 10+12 students
and their parents*

OVERALL POSITIONS (OPS)

★ WHAT IS AN OP?

OPs provide a statewide rank order of students based on their achievement in Authority subjects taken for the Queensland Senior Certificate. They tell how well students performed in their Senior studies when compared with the performance of all other students in the State. These comparisons are complicated by the fact that different students take different subjects and attend different schools.

‘OP’ stands for ‘Overall Position’. The term ‘overall’ refers to ‘over-all-subjects’ — that is, the student’s average performance across the subjects taken. It also refers to ‘over-all-students’ — that is, comparing all students in the State. The term ‘position’ emphasises that OPs indicate a rank order. Each student receives a single Overall Position. **This should be referred to as an ‘OP’, not an ‘OP score’ since it is not a score, simply a position in a rank order (first, second, third, etc.).**

There are 25 Overall Positions (OPs), from OP₁ (highest performance) to OP₂₅ (lowest performance). This means that many students receive the same position. That is, each OP represents a band of students.

★ HOW ARE OPS USED?

OPs are intended for use in tertiary selection. They are used by most tertiary institutions as one basis for making selections among applicants for a course when there are more eligible applicants than quota places for that course. There is no requirement for tertiary institutions to use OPs in selection and many alternative grounds for selection are used — for example, auditions, portfolios, interviews and, in the case of non-school-leavers, alternative qualifications. It is also possible for school-leavers to enter some tertiary courses, generally courses in vocational education and training, without an OP. However, OPs provide the most equitable way of comparing overall achievement in Authority subjects among school-leavers.

★ WHO RECEIVES AN OP?

To gain an OP, a student must study a certain number of Authority subjects and satisfy other requirements. The basic eligibility requirement is 20 semester units of credit in Authority subjects with at least three subjects taken for four semesters. Each completed semester of a subject gives a student one unit of credit; studying a subject for four semesters gives four units; taking five subjects for four semesters gives 20 units. The other requirements are completion of Year 12 and sitting for the Queensland Core Skills (QCS) Test. In special cases, such as illness, these other requirements may be waived.

The restriction to Authority subjects is based on their acceptance as appropriate preparation for university studies, especially in terms of their emphasis on ‘academic’ content and skills. Many students choose to be ineligible for an OP through the number of Authority-registered subjects they take.

★ HOW ARE OPS CALCULATED?

The calculation of OPs begins with the results students obtain in the subjects they have studied. Results in each subject studied are reported on the Senior Certificate in terms of five ‘levels of achievement’: Very High Achievement; High Achievement; Sound Achievement; Limited Achievement; and Very Limited Achievement. These results are awarded according to specified standards for each level of achievement and are verified through a process of statewide moderation in each subject.

However, each level of achievement covers a range of achievement and these results are too broad for calculating OPs. For these calculations, finer grained comparisons of student achievement are necessary. These finer grained comparisons are provided by the Subject Achievement Indicators (SAIs). Only students who are eligible for an OP are awarded SAIs; students who are ineligible for an OP are not awarded SAIs and are not included in any of the OP calculations.

WHAT ARE SAIS?

An SAI is a number which shows one student's achievement in relation to the achievement of other students in that subject in that school. Each OP-eligible student is awarded an SAI for each subject studied. The group of students studying a particular subject in a particular school is called a 'subject-group'.

For large subject-groups (14 students or more studying that subject in that school), SAIs range from 400 (highest performing student in that subject *in that school*) to 200 (lowest performing student in that subject *in that school*). **This range of numbers from 400 to 200 is used simply to compare the achievement of students in the subject-group.**

For small and intermediate subject-groups (fewer than 14 students), SAIs are expressed in terms of 'level' (level of achievement) and 'rung' (on a ladder of ten equal steps within the level of achievement) — for example, HA6. Small and intermediate subject-group SAIs are scaled differently from large subject-group SAIs.

The subject-group SAIs show the student ranking ('order') from highest to lowest and also the relative separations ('gaps') between students in that subject in that school. That is, students with similar achievement have SAIs which are close together and students with dissimilar achievement have SAIs which are further apart. Students whose achievement is of the same standard are allocated the same SAI.

In awarding subject-group SAIs, levels of achievement (VHA, etc.) are determined first. The SAIs must be consistent with those levels of achievement. That is, a student with a lower level of achievement cannot be ranked ahead of a student with a higher level of achievement. However, students with the same level of achievement may be awarded very different SAIs if the quality of their achievement is very different. Also, it is possible for some students with different but adjacent levels of achievement to be fairly close together.

HOW DO STUDENTS FIND OUT THEIR SAIS?

Schools are encouraged to provide students with provisional SAIs some time before the end of Year 12 so that there are no last minute surprises. As an accountability mechanism, schools are required to display the final SAIs for every subject so that students can check that their results accord with their expectations. Students and their parents are encouraged to examine these SAIs and discuss any queries they may have with their teachers and their school administration.

SCALING

Schools submit their subject-group SAIs to the Queensland Studies Authority which then undertakes all the scaling calculations leading to OPs.

There are two stages of scaling: the within-school stage and the between-school stage.

FIRST STAGE OF SCALING: THE WITHIN-SCHOOL STAGE

How are subject-groups compared within each school?

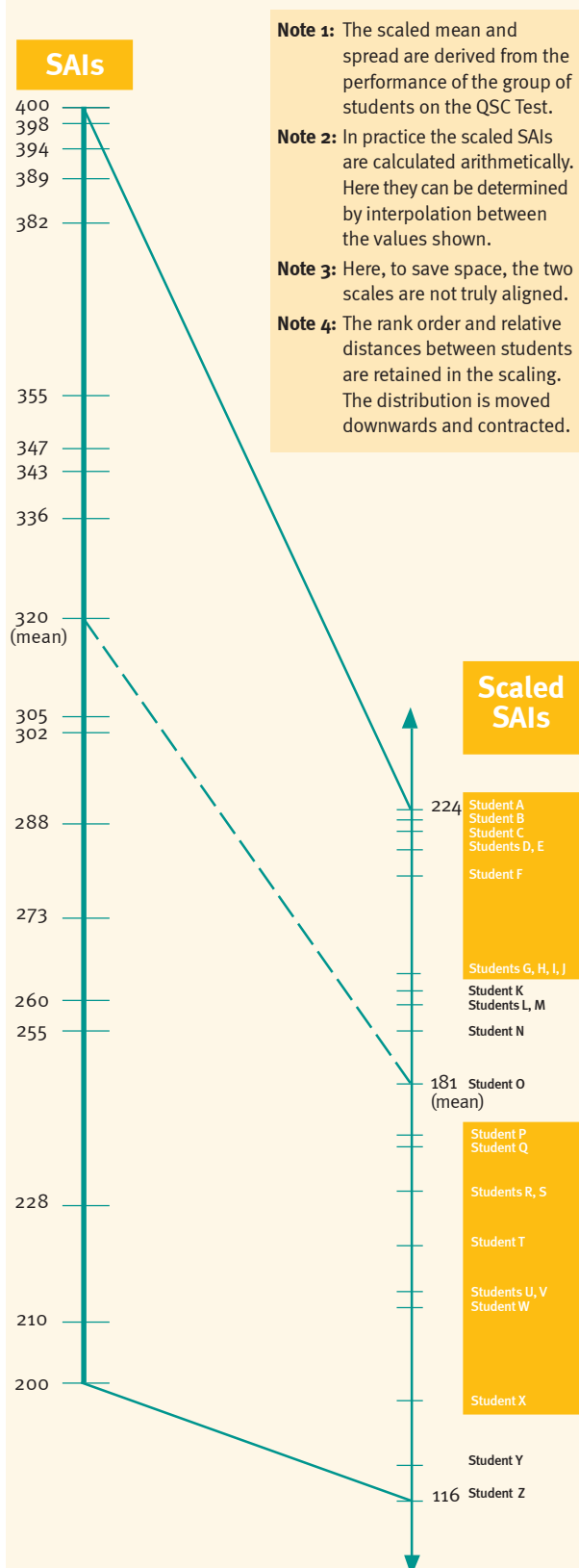
The purpose of the first stage of scaling, the within-school stage, is to make it possible to compare the achievement of students in one subject in the school with the achievement of students in other subjects in the school. For this we need a standard baseline of comparison. This baseline of comparison is provided by the Queensland Core Skills (QCS) Test. This test is designed to measure achievement on the Common Curriculum Elements (CCEs) underpinning Authority subjects, independent of specific subject content. Scores on this test provide a measure of achievement across the curriculum and can be used as a basis for comparing different groups of students.

There is another measure of achievement across the curriculum for each student within a school. This measure is derived directly from the SAIs (by interpreting these results as 'wins' and 'losses' against other students in the school in a type of round-robin tournament). This measure is called the Within School Measure (WSM).

The WSM is used to determine the emphasis to be placed on each student's QCS Test score in the scaling. If a student's performance on the QCS Test is different from that student's overall within-school subject achievement (indicated by the WSM), then it is the overall subject achievement which is taken as more valid and the QCS Test performance is discounted — that is, contributes less to the group calculations. Consequently, for example, a student who has an off-day on the test, for whatever reason, does not affect the validity of the scaling for subjects taken by that student. So too, for example, a student who performs well on the test but has not achieved well in school does not thereby contribute an unfair 'boost' to other students in subjects taken by that student.

In the within-school stage of scaling, the average and spread of the subject-group SAIs are re-set (scaled) to that group's average and spread of performance on the QCS Test. That is, the range of subject-group SAIs is mapped onto the range of scores obtained by those students on the QCS Test. These new numbers are referred to as the scaled SAIs. This is illustrated in Display 1. The relative 'order' and 'gaps' are retained; only the scale is changed. This change involves sliding (the average is lower) and shrinking (the spread is smaller) the set of SAIs. Because the statewide range of scaling scores derived from the QCS Test runs from about 75 to about 275 (technically: mean=175; mean difference=25), the scaled SAIs for any single subject-group will lie typically within this range.

Display 1: Example of Subject Achievement Indicators (SAIs) and illustration of first stage of scaling of a large group



How are small and intermediate subject-groups scaled?

The standard scaling process is inappropriate for small subject-groups, as there are insufficient data and the results would be unstable. Small subject-groups (fewer than ten students) are scaled by comparison with all large subject-groups in that subject (or similar subjects) in the State. For every large subject-group in the subject in the State, the scaled SAI boundary values relating to each level of achievement are found. These boundary values are then averaged across the State to produce a table of boundary values for small subject-groups. The small subject-group 'level' and 'rung' SAIs are then inserted between these boundary values to produce small subject-group scaled SAIs directly.

SAIs for intermediate groups (10 to 13 students) are scaled by both small subject-group and large subject-group methods and the two results are averaged.

How is a single rank order calculated within each school?

Once the SAIs have been scaled to produce the scaled SAIs, they can be compared across all subjects within a school. Scaled SAIs show how well each student has performed when compared with the overall performance of all other students in the school. Scaled SAIs only allow comparison of achievement between subjects within a school and do not allow comparison of achievement between schools within a subject.

To produce a single rank order of students within the school, an Overall Achievement Indicator (OAI) is calculated. This is the average result across each student's 'best five subjects'. 'Best' means best scaled SAIs. 'Five subjects' is shorthand for '20 semester units of credit', though for most students this means 'five subjects' each taken for the full four semesters. However, students may take some subjects for one, two, three or four semesters and their results need to be used in proportion to the number of semesters.

In calculating the OAIs, subjects count equally. To emphasise this, the calculations are actually based on the best '100 weighted semester units of credit' where every subject is given a weight of '5'. That is, all scaled SAIs are multiplied by 5.

What does an OAI represent?

The Overall Achievement Indicator (OAI) is an average (across the best five subjects, or best 20 semester units or best 100 weighted semester units). In other words, it indicates how well each student has performed across the Years 11 and 12 curriculum of Authority subjects compared with all other students *in the same school*. That is, the OAIs indicate a rank order, with relative separations or 'gaps', for all OP-eligible students within the school. It shows their overall achievement relative to all other students in the school *regardless of the combination of subjects each student took*.

★ THE SECOND STAGE OF SCALING: THE BETWEEN-SCHOOL STAGE

How are the school rank orders compared across schools?

The first stage of scaling produces a single rank order within each school given by each student's OAI. The second (between-school) stage of scaling allows these rank orders to be compared across all schools. For large schools (more than 19 students) the average and spread of the OAIs for each school are re-set (scaled) to the average and spread of QCS Test scores for all the students in that school. The emphasis to be given to each student's QCS Test score again depends on its agreement with that student's WSM. The calculation of scaled OAIs is similar to the calculation of scaled SAIs. This time the group is all OP-eligible students in the school, not just the OP-eligible students in one subject, but the principle is the same.

For small schools (fewer than 16 students) there is no second stage of scaling, that is, scaled OAIs = OAIs. For intermediate schools (from 16 to 19 students) a

combination of small school and large school methods is used. The emphasis given to each method depends on the number of students.

Scaled OAIs provide a single rank order for the whole State. These scaled OAIs compare each student with all other students in the State *regardless of their combination of subjects and regardless of the school attended.*

How are OP bands determined?

Scaled OAIs place students in a single rank order across the whole State. However, they are calculated to a greater degree of precision than it is reasonable to report. Therefore, students are 'banded' so that students who have performed very similarly are not falsely reported as being very different. Banding also ensures that the results are relatively stable and not vulnerable to minor uncertainties in subject results.

The cut-off for each OP is set each year so that there is approximate comparability with the standard of performance required to reach that OP in the previous year. This means that OPs are directly comparable from year to year.

IMPORTANT THINGS TO REMEMBER

- Scaling is not a substitute for moderation. Scaling is not concerned with comparing results within a subject across schools. In fact, the scaling process assumes that the subject results are already well moderated.
- In all the calculations for OPs, only those students eligible for an OP are included. Ineligible students are not included in any of the calculations. They will not receive any SAIs.
- Students who are ineligible for an OP may sit for the QCS Test and receive a QCS Test grade on their Senior Certificate. Their QCS Test result will not, however, be included in any scaling calculations.
- A student's own QCS Test result contributes to the calculation of group averages and spreads but does not directly contribute to that student's OP.
- Top and bottom students in each subject in each school are arbitrarily assigned 400 and 200 respectively regardless of their actual level of achievement. This is simply a standard way of capturing the 'order' and 'gaps' for those students.
- SAIs are displayed within each school but are not otherwise publicly available. It is meaningless to compare large-group SAIs across schools since they are on an arbitrary scale (400–200 for all subjects in all schools).
- Scaled SAIs, OAIs and scaled OAIs are also not publicly available since they are merely interim results in the calculation process and have no useful meaning outside that process. Only the OPs are reported as these are the only interpretable and justifiable outcome of the calculations.
- OPs cannot be predicted accurately from levels of achievement. One reason is that levels of achievement provide only a broad measure of achievement whereas OPs are based on finer comparisons (provided by the SAIs).
- Two students in the same school studying exactly the same subjects and obtaining **exactly** the same SAIs will receive the same OP.
- Schools may have very different proportions of students in each OP band. These proportions depend on the achievement of the students. **There is no predetermined allocation of OPs to schools.** OPs are awarded to students, not to schools.

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