

Explanation of Scaling and Moderating Procedures for the 2001 HSC

For most HSC courses a student's final result for a course is determined in the following manner:

Examination Marks

For each question or item in the examination a raw mark is calculated; this is the value out of which the question is marked. As some questions are considered to be more or less important than others they will sometimes be weighted. Therefore, a question that is marked out of five may be weighted down to two so that it is only worth two marks across the whole paper (it is often easier and more accurate to mark a question out of one value and then re-weigh it to its proper value). All of these marks are then added up across the examination to form a student's Total Weighted Mark (TWM).

In order to determine the performance band a student has achieved, a group of judges considers each question in the examination and decides what marks students at the borderline between each of the performance bands would be likely to achieve. This is a lengthy process that involves a review of the performance descriptors, statistical feedback, and consideration of students' scripts. Once this is complete the judges will have determined which TWMs correspond to the borders between each of the performance bands. For example, it may be determined that a TWM of say 82 is the minimum required to get into Band 6, 74 for Band 5, and so on.

In determining a student's final examination mark an initial adjustment is sometimes made to the TWM to compensate students that chose particular options on an examination that were considered to be more difficult than other options on the same examination. Once this has been done the TWM is converted to an Examination Mark (EM, also known as an aligned mark), which is the final examination mark for the course. From 2001 onwards, the EM is calculated by mapping the TWM to the performance band cut-offs. For example, if the cut-off for getting into Band 6 has been determined as 82, then all students that have received a TWM of 82 would get an EM of 90. If the cutoff for Band 5 has been determined as 74, then all students with a TWM of 74 would get an EM of 80. The cut offs for Band 4, and Band 3, Band 2 and Band 1 are mapped to 70, 60, 50 and 0 respectively. TWMs that do not fall at the cut offs are adjusted accordingly using linear interpolation. Finally, for statistical and measurement purposes, a committee of experts review the entire process for the course and determine any minor adjustments that may need to be made to the top and bottom marks for the course or to the performance band cut offs.

Moderation of Assessment Marks

All assessments submitted by schools are scaled by the Office of the Board of Studies in a process called moderation. The reason for doing this is so that direct comparisons can be made between assessment marks awarded by different schools. Schools have students of differing quality, as well as different standards in their marking and in the difficulty of

tasks and tests they set, so it is necessary to adjust all the school assessment marks in each course to a common scale.

After the examination marks have been scaled, the assessment marks for each course in each school are moderated according to the examination performance of the group of students in the school. The moderation process adjusts the assessments submitted by the school so that the mean (or average) of the group's assessments is set to equal the mean of the examination marks obtained by the students in that group, and so that the top assessment mark is equal to the highest examination mark obtained by a student in the group. The moderation process maintains the rank order of students within their school group. It is important that the marks submitted by schools show not only the rank order of their students, but also the relative differences between them as these are reflected in the moderated assessment marks.

From 2001 onwards the school assessment marks will be moderated by the Initial Scaled Marks (ISMs). An ISM is essentially a TWM (after any adjustments for the difficulty of optional questions) converted to a mark out of 50 so that they are all in the same 'currency' regardless of the unit value of the subject.

The process is the same for any course where assessments are submitted, whether it is a 1 unit course, a 2 unit course or an extension course.

There are a number of safeguards to ensure that all students are treated fairly by the moderation process. In particular, some students are initially excluded from the moderation of the assessments of their group. These include:

- students who have successful illness/misadventure appeals;
- students whose performance in the examination is markedly below what was expected on the basis of their assessments;
- special cases as determined by the Board

Excluding these students means that their examination mark is not included when the group mean is calculated, so that their performance does not affect the moderated assessments of the other students from their schools. For these students the moderated assessment is determined after the calculation of the moderated assessments for the rest of the group, by placing them at the appropriate position in the distribution.

A useful way of thinking about the moderation process is to view each school group studying a course as earning a total number of examination marks in the examination. The moderation procedures then distribute this total of marks in such a way that the rank order of the students as submitted by the school is not changed.

Thus the total of the moderated assessment marks obtained by a school group in a particular course will be the same as the total of the examination marks obtained by that school group, except where some students may have been initially excluded from the moderation process.

EXAMPLE

The following table (with figures rounded for simplicity) shows the school assessment marks, the examination marks and the moderated assessment marks obtained by a hypothetical group of six students who studied Modern History at Example High School. The rank order of the students on each set of marks is also given:

<i>Student</i>	<i>School Assessment Mark</i>	<i>Rank</i>	<i>Examination Mark</i>	<i>Rank</i>	<i>Moderated Assessment Mark</i>	<i>Rank</i>
A	90	1	92	1	92	1
B	70	2	60	3	67	2
C	65	3	65	2	59	3
D	60	4	55	4	52	4
E	55	5	35	6	43	5
F	50	6	41	5	35	6
Total:	390		348		348	
Mean:	65		58		58	

Points to note:

Mean and standard deviation

During the process of moderating the assessments, the mean of the assessments submitted by the school (65) has been changed to make it the same as the mean obtained by that group in the examination (58). The standard deviation of the moderated assessments is, in general, not equal to the standard deviation of the examination marks, although in this case they are quite close.

From a statistical point of view, it does not matter if the school assessment marks are 'too high' or 'too low'. The moderation process makes the required adjustment.

Moderated assessments and examination marks

The total of the moderated assessment marks obtained by this group (348) is the same as the total of the examination marks earned by the group.

The top moderated assessment mark is set equal to the top examination mark (92). Where possible, the bottom marks are also often equal, as they are in this case, but frequently they can differ. There are occasions when, for technical reasons, it is necessary to move the bottom moderated assessment mark above or below the bottom examination mark. This can occur when the shape of the distribution of the school assessment marks is very different from that of the examination marks.

Rank order

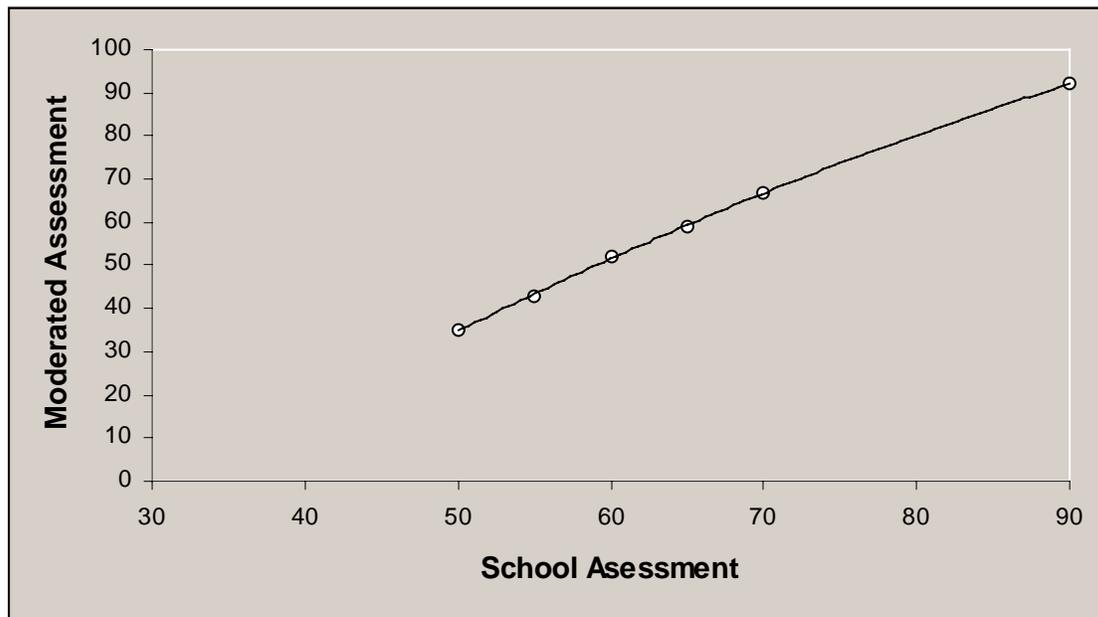
The rank order of the students based on the moderated assessments is the same as the rank order of the students based on the school assessments, even though it may not be the same as the rank order based on the examination marks.

Relative differences (gaps)

Provided the shapes of the distributions of the school assessments and the examination marks are roughly the same, the relative differences (or gaps) between the students' moderated assessments will be approximately the same as between their school assessments.

Conversion graph

The conversion relating the moderated assessments to the school assessments is given by a quadratic rather than a linear function. This means that the conversion graph is curved (parabolic) instead of a straight line. The conversion graph for this example is shown below.



The Process of Moderating Assessments

For each course, the school assessments are moderated using a quadratic formula, which ensures that for the students at each school:

- the top moderated assessment is equal to the top examination mark;
- the mean of the moderated assessments is equal to the mean of the assessment marks.

Where possible, the lowest moderated assessment is equal to the lowest examination mark. However, when the distributions of the school assessments and the examination marks have very different shapes the bottom moderated assessment mark is moved either up or down.

Note: if a school submits assessment marks with two (or more) students tied on the top assessment mark, then the top moderated assessment mark is equal to the average of the

top two (or more) examination marks. A similar procedure applies if students are tied on the bottom assessment mark.

There are other special procedures in cases such as when the bottom examination mark is markedly below what would be expected from the pattern of school assessments. Also, as previously noted, some students who perform atypically may be excluded from the moderation process.

Remember, you can't ...

- compare the performances of students in different courses on the bases of either the examination marks or the assessment marks, as such comparisons are not valid. The only exceptions to this are comparisons between the performances of candidates in standard and advanced English. In this case the Board's scaling has the effect of putting the marks on a common scale. Previously, similar comparisons could be made between 2 unit and related 3 unit and 4 unit courses where students in the 3 unit also do the common 2 unit (or the common 3 unit course in the case of 4 Unit Mathematics) as these types of courses employed equipercetile mapping to place the marks on a common scale. From 2001 onwards, the equipercetile mapping process will not be applied to Board marks and hence it is not possible to compare the marks of a course with any corresponding extension course.

So, if a student receives an examination mark of 70 in one course and an examination mark of 65 in another course, it simply means that the student performed better relative to the performance descriptors of the course in which 70 was scored. It does not mean that the 70 is a 'better' performance than the 65. This is because the performance descriptors in different courses relate to different sets of skills and abilities. In this way, the cut offs do not necessarily reflect the same caliber of performance and academic merit regardless of the course.

- calculate an aggregate score across all courses based on the examination and assessment marks reported on the Record of Achievement, as this is not valid. If this is done, a student who has taken courses where the performance band descriptors were developed so as to discriminate amongst a candidature of very high ability students (such as extension 2 courses) will be disadvantaged in comparison with a student of similar ability who has taken courses where the performance band descriptors were developed to discriminate amongst a candidature with a much wider range of ability.

Final Performance Band for the Course

The moderated assessment marks will be mapped to performance band cut offs in the same manner that TWMs are mapped, using the same cut offs as were determined for the examination. A composite mark for the course (otherwise known as an HSC mark) will then be determined for each student by averaging the EM and the mapped moderated assessment. Where this composite mark falls for each student relative to the performance

band cut off values will determine the final performance band for that student in the course as a whole. Thus, if the TWM cut off for Band 6 is 82, and a student receives a TWM of 84 (which would map to an EM of, say, 92) and a moderated assessment of 80 (which would give a mapped moderated assessment mark of, say, 89), he/she will receive a composite mark of 90.5 (the average of 92 and 89) which, being above the mapped cut off of 90, indicates a Band 6 performance.