



## Course Comparator Measure

The Course Comparator measure replaced the Relative Value (RV) measure previously available in the tool. It allows users to compare attainment in SQA graded courses against a benchmark based upon a model of attainment nationally.

This guide provides an overview of Course Comparator Measure, which includes the calculations of predicted Grade Band and Course Comparator, as well as explanations of confidence intervals and significance.

### ***Care should be taken when using the Course Comparator Measure:***

Please note that whilst four key variables (Stage, same curriculum area attainment, other curriculum area attainment and total volume of attainment) will determine the national regression model for each subject, factors such as:

- curriculum offer
- the individual **subject presentation rate** (as a percentage of the base cohort), and
- the **quality and quantity of awards** and the **presence/absence of no awards** (based on the base cohort size, rather than resulted entries) can markedly impact upon the location of each subject within a centres chart.

Additional Information:

[Insight: Technical Guide](#): Other Local Measures ► Course Comparator

The Course Comparator provides a measure of attainment in a course relative to how well learners should have achieved based on a National pattern, and is calculated using four key variables which describe learners:

- Stage the qualification was taken in
- Attainment (Total Tariff Points) in other SCQF courses in the same curricular area
- Attainment (Total Tariff Points) in SCQF courses in other curricular areas (Using Insight Tariff Scale)
- Volume of attainment in other courses (Using [SCQF](#) Credit Points)

Analysis has shown that these four key variables are important in ascertaining how well pupils should attain in a given course. In the Course Comparator measure, they are used in a multiple linear regression model for predicting grade.

### **Predicting grade band of selected course for each candidate**

Example: consider the following attainment achieved by a learner during S5 at school. We will work through how the *predicted grade band* for Physics will be calculated for this candidate.

| Curricular Area | Course      | Level      | Grade | Band | SCQF | Tariff |
|-----------------|-------------|------------|-------|------|------|--------|
| Science         | Physics     | Higher     | B     | 4    | 24   | 182    |
| Science         | Chemistry   | Higher     | B     | 3    | 24   | 182    |
| Mathematics     | Mathematics | Higher     | A     | 2    | 24   | 204    |
| Language        | Spanish     | Higher     | B     | 4    | 24   | 182    |
| English         | English     | National 5 | B     | 2    | 24   | 74     |

The values of the four key variables used to predict the learners' grade band for Higher Physics are as below:

**Stage:** 5<sup>th</sup> year

**Attainment (Total Tariff) in the same curricular area:** 182 (Chemistry)

**Attainment (Total Tariff) in other curricular areas:** 460 (Spanish, Mathematics, English)

**SCQF Credit points achieved in other courses:** 96 (4x24 SCQF Credit Points)

The predicted grade band of Higher Physics for this learner is obtained from the average performance of other candidates presented for Higher Physics nationally; given how well the learner performed in their *other* subjects, the model will predict how well *they would be predicted to do* in Physics.

#### Comparator Measure for each course

There are n candidates undertaking the selected course in the school that session.

$$\text{Course Comparator} = \underbrace{(P_1 + P_2 + P_3 \dots + P_n) / n}_{\substack{\text{the mean of grade bands} \\ \text{predicted by the model for each} \\ \text{candidate 1 to n}}} - \underbrace{(A_1 + A_2 + A_3 \dots + A_n) / n}_{\substack{\text{the mean of actual grade} \\ \text{bands achieved by candidates} \\ \text{1 to n}}}$$

The difference between the expected grade band for a learner and their actual attainment is called the *residual value*.

- If the **calculated predicted band** was 3.1 and the learner **actually achieved** a band 4 (as shown in table above) then the residual would be -0.9, indicating that this learner had achieved a less positive outcome than we would have expected them to have achieved based on national expectation for this course.
- If the **calculated predicted band** was 4.6 and the learner **actually achieved** a band 4 (as shown in table above) then the residual value would be +0.6, indicating that this learner had achieved a more positive outcome than we would have predicted them to have achieved based on national prediction for this course.

The methodology is then repeated for each candidate undertaking Higher Physics in the school that session. The mean of the residual values for each candidate is calculated to given the Course Comparator value presented in the tool. In summary (remember the lower the band, the better the result):

| <b>Course Comparator Value</b> | <b>Comparison Result</b>   |
|--------------------------------|--|
| Positive                       | If the mean of actual grade bands is less than the mean of predicted grade bands then the attainment of the selected course is better than predicted   |
| Negative                       | If the mean of actual grade bands is greater than the mean of predicted grade bands then the attainment of the selected course is worse than predicted |
| Zero                           | If the mean of actual grade bands is equal to the mean of predicted grade bands then the attainment of the selected course is as expected              |

Please note that whilst the four key variables listed above (Stage, same curriculum area attainment, other curriculum area attainment and total volume of attainment) will determine the national regression model for each subject, factors such as:

- the individual subject presentation rate (as a percentage of the base cohort), and
- the quality and quantity of awards and the presence/absence of no awards (based on the base cohort size, rather than resulted entries)

can impact upon the location of each subject within a centres chart.

Measures such as “Local Course Measure: Attainment in Selected Graded Course - Percentage of Base Centre Cohort” and “Whole School Course Summary” would aid this analysis.

### **Significance**

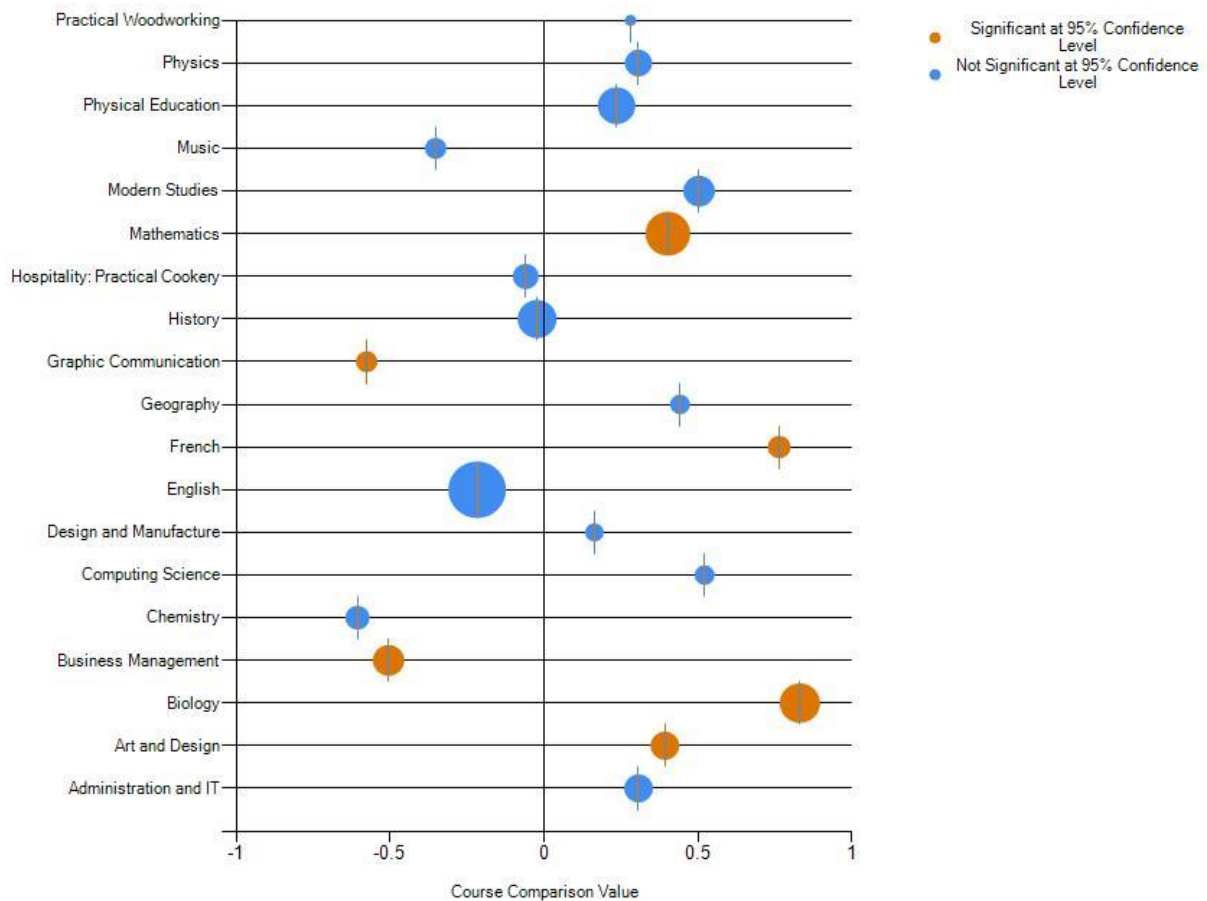
The default chart will display the result of significance testing carried out on the data at the 95% confidence level. Where significance exists at this level, the displayed circle will be orange. The confidence level displayed can be changed to 90% or 99% using the change options button.

| <b>Course Comparator</b> | <b>95% Confidence Interval</b>  | <b>Significant at 95% Confidence Level?</b>   |
|--------------------------|---|---|
| Positive                 | 95% <i>Lower</i> Confidence Limit > 0<br>and<br>95% <i>Upper</i> Confidence Limit > 0 | Yes. There is 95% in probability that the course comparator value will be positive (e.g. fall in a 95% positive interval) |
| Negative                 | 95% <i>Lower</i> Confidence Limit < 0<br>and<br>95% <i>Upper</i> Confidence Limit < 0 | Yes. There is 95% in probability that the course comparator value will be negative (e.g. fall in a 95% negative interval) |

When zero is outside the 95% confidence interval, e.g. both lower and upper limits are either positive or negative, the course comparator is marked as significant. The confidence level is set by default at 95% but users are also able to change this to 90% or 99%.

## Visualisation

### Course ► Local Course Measure: Course Comparator – All Graded Courses



Each course and level (this example uses National 5 for S4 learners) which has a Course comparator calculated will be displayed on the y-axis and will have a circle placed on the adjacent horizontal line, positioned to match the Course Comparator value on the x-axis. A zero value will be displayed centrally, negative values to the left of centre, positive values to the right of centre.

The size of the displayed circle is proportional to the number of learners included in the calculation for that course and level.

The chart can be filtered to give values for each combination of sex and stage within the school and can be displayed for the preceding 5 years, using the change options button.

| <b>Graph</b>               | <b>Description</b>   | <b>Examples from the above diagram</b>  |
|----------------------------|--|---|
| Axis                       | y-axis = selected course<br>x-axis = value for comparator                              | A zero value will be displayed centrally.<br>Negative comparators are displayed to the left of centre (e.g. English) ; Positive comparators are displayed to the right of centre (e.g. Mathematics)   |
| Colour Of Displayed Circle | orange = significant<br>blue = not significant   | The comparator value is significant when it is big enough to represent a real statistical difference between the actual attainment and the expected attainment.<br><br>Although performance in English appears to be around quarter of a band worse than expected, this is not statistically significant and therefore we cannot be confident that it represents a real difference. (though it may be at the very least a point of interest if this happens year on year) |
| Size Of Displayed Circle   | The size is proportional to the number of learners involved in the significant testing | The significant result will be more representative if there are more entries involved in testing. E.g. for the significantly under-performing courses, we might focus more on Business Management other than Graphic Communication due to the number of entries.  |