

Guidance for teachers

**Statistics
Spearman's rank**

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Teacher guidance

Please use the following guidance to structure the session.

Prior learning of statistical techniques (GCSE Maths) would be beneficial, but it is not essential.

Resources required:

- Plenary SP A6.9 lesson 4
- Retrieval grid A6.9 lesson 4
- Lesson 4 Spearman's rank
- Spearman rank worksheet – Lesson 2 of 2
- Spearman rank worksheet – Lesson 2 of 2 answers (PPT format for display)
- Mini whiteboards

Slide 3 should be used to help learners to understand the importance of the topic.

Introduction (5 minutes)

The session begins by informing learners of the topic. Learners will be introduced to the learning outcome on slide 2.

A6.9 The purpose of the following statistical techniques when analysing data:

Spearman's rank

The learners will be advised that they are continuing their work on processing paired data using the Spearman's rank correlation coefficient.

Lesson development opportunities:

Learners could also be asked to map employability skills, such as collaboration, analytical thinking and evaluation, that they will develop from this.

Learners could be asked to give examples of settings where ranking of data and their relationship could be used. Correlations are often used to describe the strength of association between two factors, such as increased rates of smoking leading to increased rates of lung cancer.

Learners could also be asked to map employability skills that they will develop from this and give their own examples of how they could make use of these in industry.

Starter (10 minutes)

The session will begin with tasking learners with a retrieval grid asking learners to recall information on Spearman's rank and other statistical techniques from the previous sessions covered in the previous three weeks.

The retrieval map can be used in the following way:

Teachers can allocate questions according to their judgement in the session.

Feedback at the end of the activity could be drawn in various ways, including verbal feedback or Q&A.

Delivery (10 minutes)

The session will begin to recap the previous session's delivery. It would be useful to have lesson 3 available as a visual for learners to help them to recall the content covered in the previous session.

The formula on slide 6 will be used when asking learners what each of the symbols mean and what step they define in the process of calculating the coefficient.

It would also be useful to remind learners of the rule to be applied when the rankings tie. If you have two or more values of the same rank (tied values), you add together the rank values, divide by the number of values and allocate this number for the rank of each of those values.

This learning will help to establish the techniques before learners are able to apply them on contextualised questions.

Learners will then be asked to make a note of the meaning of calculated coefficient values to use when drawing conclusions from their own calculations later. This can be sourced from slide 8.

The emoji meter on slide 9 can be used as a learning checkpoint to gauge understanding in the classroom.

Worked examples 1 and 2 (25 minutes)

This section will revisit the worked examples from the last session. The teacher should complete the worked example 1 on slides 10–12. More able learners could be asked to complete worked example 2 independently while the teacher delivers the same worked example to the rest of the group. This is a development activity on the previous session where the learners were taken up to the ranking stage only.

There may be learners that are struggling, in which case a more scaffolded delivery approach should be taken, ie, recalling the formula once again before prompting and reminding that it is good practice to write the formula down against every new question they come across.

Worksheet tasks (45 minutes)

Learners will be tasked with completing the five tasks on the Spearman's rank worksheet (Lesson 2 of 2) to address the topic's contextualised concepts. For each question, learners will be presented with complex datasets and asked to calculate the coefficient and determine the relationship between the variables.

Learners could complete this work in pairs so that they could peer assess one another at their table and present their findings to one another. For example, at a table of four, one pair could be tasked with the first question and the other with the second question. Once they have completed this, they should deliver the calculation and findings of the question to one another. This will allow them to participate in collaborative learning and map employability skills such as collaboration and communication throughout the session.

Stretch and challenge: Learners to interpret the correlation between the variables based on the values calculated.

Feedback and review (10 minutes)

This part of the session will give feedback to the learners and bring them back to the front of the room. The teacher should use this time to deliver the solutions to learners and give learners an opportunity to volunteer their answers. This will not only give learners the opportunity to engage in presenting their work but also help learners that may have struggled with the task to take on new approaches to the question.

Plenary (15 minutes)

In this part of the session, learners will be asked to complete a retrieval grid assessing them on their knowledge and understanding of the last two sessions on Spearman's rank.

Final teacher review of learning outcome A6.69.

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