

Guidance for teachers

**Statistics
Spearman's rank**

ETFOUNDATION.CO.UK

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:

- Lesson 3 Spearman's rank (ppt)
- Retrieval grid A6.9 lesson 3
- Spearman rank worksheet – Lesson 1 of 2
- 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 introduction will then transition into the importance of using these techniques in industry.

The lesson content is focused on understanding the purpose of the statistical method and introducing how to start the calculations by ranking the paired sets of data. The following lesson will ask them to extend this into the use of the full Spearman's rank formula.

The Luminate Education Group is delivering this programme on behalf of the Education and Training Foundation.
This programme is funded by the Department for Education.

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, eg, 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 by tasking learners with an activity designed to map prior learning. The activity will be the use of the retrieval grid.

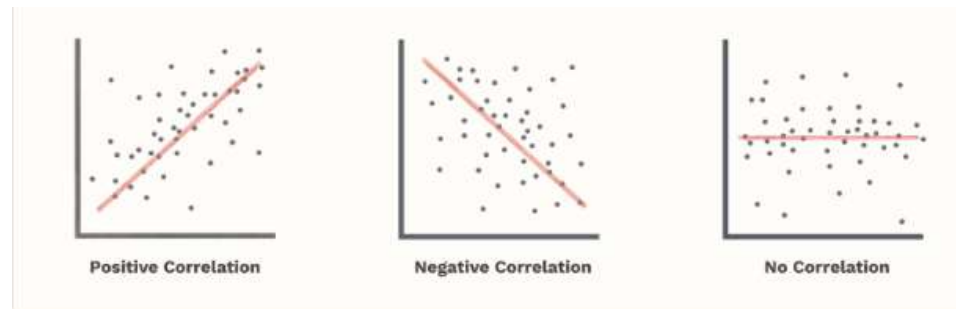
Learners are provided with four questions across the last few sessions. Throughout the activity, navigating around the room would be beneficial for the teacher to gauge an idea of progress.

Feedback at the end of the activity could be drawn in various ways, including verbal feedback or Q&A. Feedback for this could also be supplied as written feedback if the retrieval grids are collected.

The emoji meter on slide 5 can be used as a learning checkpoint to gauge understanding in the classroom.

Delivery and worked examples (30 minutes)

The session will transition to a delivery mode where learners will be walked through Spearman's rank and how it is defined. The teacher should explain that Spearman's rank is used to show an association between two factors such as an increase in weight or obesity and an increase in diabetes.



Learners will be shown how to rank the data given (slide 7) and how the rankings can be presented in charts. This will be a teacher-led delivery phase where learners could be asked to suggest the chart presentation for each form of correlations before it is revealed, as presented through slides 7–12.

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

The emoji meter on slide 13 can be used as a learning checkpoint to gauge understanding in the classroom.

After the checkpoint, learners will be introduced to the formula and what each of the symbols in it mean (slide 14). Each symbol is a step that is explained to learners. Once this has been explained, learners will be asked to recall the process to check learning. This can be carried out via mini whiteboards.

Slides 15–16 will be used to explain to learners how each step is carried out. Following this delivery period, learners will be allocated 15 minutes to attempt to carry out the ranking of the dataset on slide 17 then work out the difference (d_i) and the square of the difference (d_i^2) between the ranks. This will be a good opportunity for the teacher to move around the room to engage with learners who may be struggling with the concept of the topic and to help them to catch up. This would provide a good foundation for the next lesson, where the learners will be expected to apply the formula in full.

After the 15 minutes have passed, the teacher will review the learners' answers and show them what the method should include.

Before a checkpoint meter is applied, learners will be presented the rule via slide 18 and encouraged to adopt it in upcoming questions.

The Luminate Education Group is delivering this programme on behalf of the Education and Training Foundation.
This programme is funded by the Department for Education.

The emoji meter on slide 19 can be used as a learning checkpoint to gauge understanding in the classroom.

Tasks 1 and 2 (25 minutes)

After delivery, learners will be tasked with their first of the contextualised questions using the Spearman's rank worksheet (Lesson 1 of 2). At this point of the session, there may still be learners who will struggle with the concept of this topic. It would be beneficial to get learners who are progressing with slide 20 to also complete slide 22. For the remaining learners, a scaffolded approach should be taken in recapping slides 15–18 using a virtual whiteboard to work through an example. Hand span and height is a dataset that could be collected in the classroom.

Feedback for the session should be offered through verbal feedback and, after the allocated time, the solutions should be made available to learners to either peer mark their work or complete their marking independently. Further review of feedback can be undertaken once the tutor has collected the learners' work.

The emoji meter on slide 24 can be used as a learning checkpoint to gauge understanding in the classroom.

Testing a hypothesis (35 minutes)

Use slides 25–26 to introduce the idea of using Spearman's rank in a healthcare environment as a data analysis tool to search for correlations between health factors and possible areas of risk.

Learners are reminded of the scientific method, ie, the idea of formulating a hypothesis that leads into the research, data processing and interpretation stages.

Lesson development opportunities:

Depending on the ability of the cohort, this could be left as an embedded activity in a single lesson or could be developed into an ongoing project where learners are asked to complete their plan and collect real sets of data to process and interpret.

Plenary (15 minutes)

Learners will be asked to recall the Spearman's rank formula.

Learners should be able to complete this task very quickly. They should then be put into pairs and asked to demonstrate their understanding of how the formula should be applied by identifying the symbols and writing out a sequence of steps. Learner 1 writes out the first step, learner 2 adds the second step and so on.

**PRODUCED
BY**



Luminate Education Group has produced this resource on behalf of the Education and Training Foundation

**FUNDED
BY**



**Department
for Education**

This programme is funded by the Department for Education

The Luminate Education Group is delivering this programme on behalf of the Education and Training Foundation. This programme is funded by the Department for Education.