



Activity description

Students use weather data to consider which month would be the best to hold an outdoor music festival.

The activity gives students practice in using either a calculator in Statistics mode or a spreadsheet to calculate mean and standard deviation values.

Suitability and Time

Level 2 (Intermediate/Higher)

1–2 hours (possibly longer if students also draw charts and graphs)

Resources and Equipment

Student sheets

Optional: slideshow, spreadsheet

Scientific calculators or computers

Key mathematical language

Mean, median, standard deviation

Notes on the activity

There are two versions of this activity, and two different student sheets.

Music Festival A for use with scientific calculators

Ensure that students are using the same calculators they will have in the examination and that they are familiar with the Statistics mode.

The student information sheet gives temperature data for 2001–2010 and shows how to calculate the mean and standard deviation for July.

Version A of the slideshow includes the same information and can be used to introduce the activity. Note that slide 5 gives one of the formulae that can be used to calculate standard deviation, but this can be omitted if you wish. Students do not need to remember this formula – they are expected to use the Statistics mode on their calculators to work out the standard deviation.

The slideshow and student sheets both give values for the mean and standard deviation of the temperatures in July between 2001 and 2010, then those for August. It is suggested that you ask students to check that they can find these, then discuss the results with them.

Students then go on to the more open-ended part of the activity in which they find and compare results for other months and other weather data. You will need to provide students with the data you want them to use for this part of the activity.

The accompanying spreadsheet includes temperature, sunshine and rainfall data for England and Wales (EW), Scotland (S) and Northern Ireland (NI) for each month in the period 1960–2010. You may wish to reduce the amount of data or allocate different datasets to different students. The ‘Music Festival spreadsheet for teachers’ gives the results for periods of 10, 20 and 50 years.

Music Festival B for use with a spreadsheet

This version is for use with the accompanying 'Music Festival spreadsheet for students'. The spreadsheet includes temperature, sunshine and rainfall data for England and Wales (EW), Scotland (S) and Northern Ireland (NI) for each month in the period 1960–2010. You may wish to reduce the amount of data or allocate different datasets to different students.

The student information sheet gives temperature data for 2001–2010, and the spreadsheet formulae for calculating the mean and standard deviation.

The slideshow includes the same information and can be used to introduce the activity. Slide 4 gives one of the formulae that can be used to calculate standard deviation, but this can be omitted if you wish. Students do not need to remember this formula – they will be expected to use the spreadsheet to work out the standard deviation.

The slideshow and student sheets both give values for the mean and standard deviation of the temperatures in July and August between 2001 and 2010.

You could use one of the worksheets in the 'spreadsheet for teachers' to demonstrate how to find these for the period 2001–2010. It is suggested that you ask students to check that they can find these, then discuss the results with them.

Students then go on to the more open-ended part of the activity in which they find and compare results for other months and other weather data.

The 'spreadsheet for teachers' gives the results for periods of 10, 20 and 50 years.

During the activity

Individual students or pairs of students could be allocated different factors to investigate and the results pooled for final discussion.

Points for discussion

Discuss questions such as:

- Why has the mean been used rather than the median or mode?
- Which matters most – rain, warmth, sunshine?
- Would the results be more reliable answers if you used data from a longer period?
- Would you need to take climate change into account if you used data going back 50 years?
- Can you predict next year's weather reliably from previous data?

Extensions

Students could include charts and graphs in their reports.

Less able students could omit standard deviation. More able students could use moving averages.