**Pearson Edexcel Level 3 Certificate in Mathematics in Context**

**Comprehension teaching and practice material**

These materials are designed to support teaching and learning of mathematical comprehension skills. They may be used for classroom discussion, teaching and learning and/or student practice. They provide comprehension practice on four topics as follows:

Waste and recycling

Earthquakes

**Winter Olympics**

Ebola

Each zip file contains four types of material as follows:

Teacher notes

Comprehension passage and questions

Mark scheme

Spreadsheet(s)

These teacher notes suggest other supporting resources including videos. The teacher notes also provide a mapping of the task questions to GCSE Mathematics (9-1) and the current GCSE Statistics and indicate where skills specific to Mathematics in Context are required. Some tasks’ questions include more challenge than others and this is made clear within the teacher notes.

Students should have access to formulae where required. The formulae sheet is  provided in the specification (Appendix 3) and in the sample assessment materials.

**Winter Olympics**

**Background**

The 2014 Winter Olympics took place in Sochi, Russia.

Although concerns had been raised over possible terrorist attack and over a lack of snow, the games went off very successfully. Britain managed 4 medals and narrowly missed out on at least one more. We have a good record in the Winter Olympics having won medals before, mainly in the ice skating but more recently in curling and in bobsleigh events.  
The games have benefitted by the introduction of new events such as snowboarding, for example.

This task involves the use of mathematics to explore issues around success in the Winter Olympics. Students will be able to practise the statistical techniques they have learned and to interpret their calculations in context.

**Resources**

[https://www.youtube.com/watch?v=bdn1-vO\_-Qk](https://www.youtube.com/watch?v=bdn1-vO_-Qk%20) gives a short ( about 5 min) history of the Winter Olympics.

The Excel file Core Maths Winter Olympics Data Source A has 3 spreadsheets corresponding to the 3 tables which students may use.

**Comments on the questions**

**1** (a) A knowledge of simple Excel functions is needed.

(b) (i) As the data is already in order, look for the 13.5th value in Table 1 and then the 7th value and so on in Table 1. Similarly for Table 3. The calculation of IQR for small data sets can be done if slightly different ways. To allow for this give some tolerance in the answers.

See for example <http://mathworld.wolfram.com/Quartile.html> )

(ii) Make reference to the medians and the IQR together with some interpretation in context.

(c) The remainder of the entries are 0 and most of the statistics will collapse to 0.

**2** (a) (i) *n* = 26, Σd2 = 1840.5

(ii) A quick way to deal with this is to copy the table into a spreadsheet.

(iii) Do this one in order to answer part (b).

(b) Higher values of Spearman's *r* are related to greater correlation (in context).

**3** (a) *n* = 20 Students can copy the table for inserting values of Σ*fx* and Σ*fx*2

(b) Make a comment about typical temperatures and a comment about the dispersion of the contexts.

(c) Use *np*

(d) This is not particularly high!

(e) No effect as correlation coefficients are independent of the units used. (Can be explained from arguing the units on the top and on the bottom of the correlation coefficient formula are the same, so cancel).

**Analysis based on GCSE (9–1) Mathematics and GCSE Statistics (current specification)**

**Task: Winter Olympics**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Question** |  | **Demand/Content** | | | | |
|  |  | **GCSE Maths** | | **GCSE Stats** | | **Other** |
|  |  | **F** | **H** | **F** | **H** |  |
| **1 (a)** | Knowledge of spreadsheet notation |  |  |  |  | In the generic statement about skills |
| **(b)(i)** | Box plot |  | ✓ | ✓ |  | A4 |
|  | (Outliers) |  |  |  | ✓ | A5 |
| **(ii)** | Comments |  | ✓ |  |  | A5 |
| **2 (a)(i)** |  |  |  |  | ✓ | A10 |
| **(ii)** |  |  |  |  | ✓ | A10 |
| **(iii)** |  |  |  |  | ✓ | A10 |
| **3 (a)** | Mean | ✓ |  | ✓ |  | A5 |
|  | Standard deviation |  |  |  | ✓ | A5 |
| **(b)** | Comment |  |  |  | ✓ | A5 |
| **(c)** | Estimate based on a probability | ✓ |  |  |  | A1 |
| **(d)** | Interpret a correlation coefficient |  |  |  |  | A8 New to Core, but requires interpretative skill not mathematical technique. |
| **(e)** | Interpret a correlation coefficient |  |  |  |  |