ASSESSMENT TASK

SUBJECTS: Mathematics and PDHPE

YEAR GROUP: 8

TASK TITLE: Analysis of Fitness Testing Results

Name of Unit: Analysis of Fitness Testing Results

Type of Task: To be completed at school and at home

Due Date: Term: 1 Week: 10

Weight: 25%

OUTCOMES ASSESSED

Mathematics
MA4-19SP collects, represents and interprets single sets of data, using appropriate statistical displays
MA4-20SP analyses single sets of data using measures of location, and range.

DESCRIPTION OF ACTIVITIES

PART A: Collecting the Data and Completing Fitness Tests

- As part of the PDHPE Fitness Testing unit, students will complete THREE Fitness Tests in practical lessons: 50m Sprint, Illinois Agility Test and the number of push-ups in one minute.
- Students are to record the scores for each student in their class on the spreadsheet provided by your PDHPE teacher.

PART B: Displaying the Data and Statistical Measures

- Using Microsoft Excel, students are to calculate the MEAN, MODE, MEDIAN AND RANGE for the three sets of Fitness Testing data recorded in Part A.
- Using the data for the 50m Sprint test, students are to create a Frequency Distribution Table displaying the results for their class. In this table, scores must be grouped in one second intervals (e.g. 5 – 5.99, 6 – 6.99, 7 – 7.99 etc.).
- Using the Frequency Distribution Table, students are to create a suitable graph of their choice (e.g. Column Graph, Line Graph etc.) to display the data.
- Students are to use the attached instructions and demonstration from their Mathematics teacher as a guide. Instructional videos are also available on the Year 8 Mathematics Moodle site. The URL’s are also given in the following booklet.

PART C: Analysis of Results

- Using the calculations from Part B, evaluate your current level of fitness through a comparison to class averages and “norms”.
- Outline how you can improve your result for ONE fitness test. In your response, refer to Components of Fitness and the use of the FITT Principle. Students must compare their results with the results of their classmates by referring to the mean, mode, median and range scores for the class, taking note of any outliers that may have occurred.

METHOD OF SUBMISSION

Late submissions lose 25% the first day, 50% the second day and on the third day no grade is given. However, you are still required to submit the task.
Work that is plagiarised will not receive a grade and will need to be resubmitted.
Sources that have been used in your assignment need to be acknowledged in a reference list
Computer / printer malfunctions are not considered a valid excuse for submitting an assignment late.
Extensions must be applied to the TLC well before the due date.

GLOSSARY of KEY TERMS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluate</td>
<td>Make a judgement based on criteria; determine the value of</td>
</tr>
<tr>
<td>Outline</td>
<td>Sketch in general terms; indicate the main features of</td>
</tr>
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PART A: Collecting the Data and Completing Fitness Tests

- As part of the PDHPE Fitness Testing unit, students will complete THREE Fitness Tests in practical lessons: 50m Sprint, Illinois Agility Test and the number of push-ups in one minute.

- Students are to record the scores for each student in their class on the spreadsheet provided by your PDHPE teacher.

- This RAW DATA recording sheet must be included in the final submission of the task.

PART B: Displaying the Data and Statistical Measures

- Students will use Microsoft Excel – Spreadsheet for this section of the task. Students MUST e-mail the file to their MATHEMATICS teacher so all formulas and calculations can be assessed.

- Students are to input the scores for the three sets of Fitness Testing into a spreadsheet.

- Using the data for the 50m Sprint test, students are to create a Frequency Distribution Table displaying the results for their class. In this table, scores must be grouped in one second intervals (e.g. 5 – 5.99, 6 – 6.99, 7 – 7.99 etc.).

- Using the Frequency Distribution Table, students are to create a suitable graph of their choice (e.g. Column Graph, Line Graph etc.) to display the data.

- Students are to calculate the MEAN, MODE, MEDIAN AND RANGE for ALL three sets of Fitness Testing.

- Students are to use the “Using ICT in Data collection, Representation and Analysis Booklet” – Appendix A as a guide for PART B. This booklet will also be given to students in Mathematics classes whilst studying the unit “Data collection, Representation and Analysis”. In additional, instructional videos will also be available on the Year 8 Mathematics Moodle site. The URL’s are also provided in the following booklet.
**PART C: Analysis of Results**

- Using the calculations from Part B, **evaluate** your current level of fitness through a comparison to class averages and “norms”. This means you must compare your results with the results of your classmates by referring to the mean, mode, median and range scores for the class, taking note of any outliers that may have occurred. Appendix 2 contains common phrases used when describing data that may assist you in this task. The phrases contained in the Appendix are not related to the data you have gathered so you will have to change the language to suit your data.

- **Outline** how you can improve your result for ONE fitness test. In your response, refer to Components of Fitness and the use of the **FITT Principle**.

<table>
<thead>
<tr>
<th>Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fitness Test:</strong></td>
</tr>
<tr>
<td><strong>Class Mean:</strong></td>
</tr>
<tr>
<td><strong>Class Mode:</strong></td>
</tr>
<tr>
<td><strong>Any Outliers:</strong></td>
</tr>
</tbody>
</table>
Name: _______________________________________

PDHPE Teacher: _____________  Mathematics Teacher: _______________
Appendix 1:

Using ICT in Data collection, Representation and Analysis

Background:

During this topic you have covered how to collect data, how to display data in forms, how to graph the data and how to analyse the data and calculate the mean, mode, median and range. You have done all of this using pen, paper and calculators. It is often quicker and easier to use a spreadsheet to do all of the above and this booklet explains it all. This booklet will be of great assistance to you in completing your combined Mathematics/PE Assessment where you are required to gather data on various fitness tests, present the data and analyse the results of the data gathered.

For the purposes of this booklet Microsoft EXCEL SPREADSHEETs have been used

Instructional Videos:

In addition to the following booklet, instructional videos will be available for you to follow on the Year 8 Moodle page and on the School’s website, under the Curriculum tab, and then Assessments. Alternatively, you can type in the following URL’s.

Mean, mode, median, range:

https://www.youtube.com/watch?v=F5CMQuvlWXE

Creating graphs:

https://www.youtube.com/watch?v=DM52xjSLGqs
Part A: Gathering, Storing and Presenting the Data in an Excel Spreadsheet

Part A of your assessment requires you to gather not only your results but also the results of your classmates. You will need to input the results into a spreadsheet. You will need to know HOW to enter the data.

Aim: To learn about

- COLUMNS
- ROWS
- CELLS
- FORMULA BAR
- Difference between NUMERICAL DATA and TEXT DATA
- How to highlight in Excel
- How to INSERT a ROW of a COLUMN
- Change the size of a COLUMN or ROW
- ORDER the data

1. Spreadsheets consist of ROWS and COLUMNS. ROWS are numbered and COLUMNS are named using letters. The intersection of a ROW and COLUMN is called a CELL and is named using the COLUMN and then ROW. So CELL B6 is the square where COLUMN B and ROW 6 intersect. If you click on CELL B6 - it is highlighted and you can type in it. When you type the text appears in the FORMULA BAR above.

2. Note that TEXT INPUT - such as the word Hello- is LEFT ALIGNED. The NUMERICAL INPUT- such as CELL D4 which has 19 in it- is RIGHT ALIGNED. If you want a number to be recognised as TEXT rather than a NUMBER you have to type an APOSTROPHE in front of the 19 when you INPUT it- like this ‘19- look at CELL G4. That 19 is now a TEXT not a NUMBER. You will have to INPUT numbers for your Assessment.

3. If you need to HIGHLIGHT anything in spreadsheets you do the same as for word- start at the beginning of what you want to highlight and keep pressure on while you DRAG over what you want highlighted. You can BOLD, ITALIC, UNDERLINE etc. - just like in word.

4. To INSERT a COLUMN or ROW - highlight the column or row you wish to INSERT BEFORE. Then choose INSERT from the RIBBON above. Ensure the RIBBON is on HOME.
5. To CHANGE THE SIZE of a COLUMN or ROW you can HIGHLIGHT the COLUMN/ROW and choose HOME- FORMAT- ROW HEIGHT or COLUMN WIDTH. Alternatively you can hover over the end of the COLUMN at the top of the file and when the pointer changes to a cross DRAG the COLUMN to the width you want.

6. Once you have INPUT the DATA you can order it in ascending or descending order. HIGHLIGHT the DATA you want to order then choose HOME-SORT AND FILTER- SORT SMALLEST TO LARGEST (or what you want)

Let’s practice all that we have learnt about INPUTTING DATA. Set up a spreadsheet to look like the one below:

Then
1. Change the size of your columns to fit the headings
2. Bold the headings, enlarge the font
3. Centre the columns
4. Sort the columns from smallest to largest

Your spreadsheet should look something like:
Part B: Frequency Distribution Tables, Graphs and Data Analysis

Part B of your assessment requires you to present the data in a Frequency Distribution Table with the scores grouped in one second intervals, display the data in a suitable graph and calculate the mean, mode, median and range for the data.

Aim: To learn about

- Frequency Distribution Tables- grouped data
- GRAPHS
- MEAN
- MODE
- MEDIAN
- RANGE

1. Excel does not automatically collate your data into a Frequency Distribution Table. You will have to create one yourself. You will still need to keep the raw Data to calculate the mean etc. You can include MULTIPLE SHEETS on the one Spreadsheet file. Look for SHEET 1 at the BOTTOM of your spreadsheet. Next to SHEET 1 there is a + symbol. See diagram to left.

   Click on + and another SHEET is created in the same file you are using. So SHEET 1 can contain your RAW DATA. SHEET 2 can contain your Frequency Distribution Table etc.

2. In SHEET 2 create a frequency distribution table. Set up your columns as in Part A. For this booklet the data used in Part A will be used for the table. Once all the data has been inputted the Frequency Distribution Table should look something like:
3. Now you have to choose a suitable GRAPH. Highlight BOTH COLUMNS- So A2 to B7 – and choose INSERT. When you click on INSERT- you can choose from a wide range of graphs- some are included below:

![Graph Examples]

4. You have to choose the most appropriate graph to display the data in a professional way to convey the most meaning. For this data I will choose a column graph. You can change the Chart Title, insert Axis Titles (click on the + next to the chart to add other elements in as well), change colours etc.

![Time to Walk Classroom Graph]
5. Calculating the MEAN, MODE, MEDIAN and RANGE is a case of using the inbuilt FORMULAS that Excel has. When using FORMULAS you ALWAYS start with an EQUALS SIGN (=) to show that you are using a FORMULA. You also have to consider what DATA you are going to use and indicate it like so- A2:A9- with the first CELL being the starting point then a colon “:“ and then the CELL where your DATA ends. Let’s learn the FORMULAS:
   a. MEAN- Excel call this AVERAGE- so you type =AVERAGE(A2:A11) - this will give you the MEAN of the scores starting at A2 and ending at A11
   b. MODE- the FORMULA for MODE is simply =MODE(A2:A11). You have to be careful as this gives you the FIRST MODE only. So if your data actually has more than one MODE- EXCEL will only give you the first one. You must CHECK your data.
   c. MEDIAN- simply =MEDIAN(A2:A11)
   d. RANGE- Excel doesn’t have a RANGE formula – but you can use the Max and MIN to find the RANGE. Type in =MAX(A2:A11)-MIN(A2:A11) This will calculate the MAXIMUM score minus the MINIMUM score- which gives you the RANGE.

6. So for the DATA we have been using- go back to SHEET 1- with you RAW SCORES on it and type in all of the above to calculate the MEAN, MODE, MEDIAN and RANGE. You can also edit and format the file a little and insert headings etc. It should end up:

   ![Spreadsheet with calculations](image)

**Conclusion:**

After following the information above, all students will be able to successfully complete the combined Mathematics/PE Year 8 Assessment. Good Luck!
Appendix 2:

Describing Data

Below is some different ways that students have described data sets in previous assessments. These assessments analysed different data than the data sets you have been asked to analyse in this assessment. These descriptions have been included to help you write your letter. You may wish to use some of the statements in your letter whilst referring to the data of Best Actor Winners.

Approximately 75% of the data ranges from ___ to ___.

The heights of Year 9 students range from ___ cm to ___ cm, but ___% of them are over ___ tall, which is considered to be the national average for girls of this age.

The most common response by far was ___, which was given by 40% of the people surveyed.

The responses ___ and ___ were given by more than half of the people interviewed. There are 2 clusters of scores, centred near ____ and ____.

This survey shows that approximately 2 out of 3 students have no siblings or only one sibling. Families with more than 4 children are very rare.

Two of the scores ( __ and __ ) are significantly different to the others and appear to be outliers.

There was a large difference between the mean (12.5) and the median (18). This indicates that the data collected is not symmetrical.

Only 3 of the 12 scores collected were below the mean.

The mean/median/range was much lower/higher than expected.

The frequency histogram indicates that the collected data is perfectly symmetrical/almost symmetrical/not symmetrical/positively skewed/negatively skewed.

25% of the people surveyed under-estimated their own weight.

The median for the men is significantly higher than the median for the women.