**Stage 1 Essential Mathematics**

**Assessment Type 2: Folio**

**How to Pay a Pizza Shop Telephone Operator**

**The Task**

You have been offered a job with a large pizza chain to take telephone orders for their wide range of pizzas.

You have two choices in the method of payment:

* Paid per hour with overtime (wages)
* Paid a set amount per order taken (piecework).

Your employer has provided you with the hours worked and sales data over a 4 week period for the previous telephone operator. The employer is giving you the information so that you can make an informed decision about which method of payment to choose.

All information for the mathematical investigations is provided over the page. Read the information below about the report you will create, and then get started!

**The Report**

You will complete a report to submit to your teacher which will include the following:

**Introduction**

In your own words *clearly explain* what you have to do in this task.

**Mathematical Calculations**

Use the information on the following page, and the rates your teacher gives you, to calculate the payments you would receive in each scenario in Part 1 and Part 2, and the extension activity if you complete it.

* You must *show all working* for Part 1 (including any equations used and the steps in the calculation).
* You must include the spreadsheet used for Part 2, showing the figures you were asked to calculate. A copy of the formula used in the spreadsheet should be included in an appendix.
* Any work you complete on the extension activity.

**Discussion**

*Clearly state* which method of payment you would choose and *why* you would choose it. Make sure that you refer to figures (values) from your calculations in your discussion.

You might also explain why this method of payment was the best in the calculations you carried out, and under what circumstances the other methods of payment might be more attractive.

**Conclusion**

*Write a short letter* to your new employer, accepting the job.

Make sure you clearly state the payment method you have chosen and the rates of pay you are agreeing to.

**Your entire report should not be more than a maximum of 6 A4 pages.**

**Ask your teacher to complete the table below with all the information you need to complete the calculations for Week 1.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Week** | **Standard hours worked** | **Overtime hours worked** | **Number of orders taken** | **Standard hourly rate** | **Overtime rate** | **Rate per order taken** |
| **1** |  |  |  |  |  |  |

**Part 1** Showing all of your working out, and the equations you have used, work out the payment you would receive for the **first week** if you were paid:

* A wage – paid at an hourly rate plus overtime
* Piecework – where you are paid for every order you take.

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Standard hours worked** | **Overtime hours worked** | **Number of orders taken** |
| **2** | 15 | 3 | 495 |
| **3** | 20 | 1.5 | 530 |
| **4** | 12.5 | 6 | 481 |

The employer also gave you the information for Weeks 2, 3 and 4 in the table alongside.

You decide it would be more efficient to work out the weekly payments over the **four weeks** of payment information and sales data using a spreadsheet.

**Part 2** (i) Create a spreadsheet with the following headings and fill in all given information for Weeks 1 to 4.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Week** | **Standard hours worked** | **Overtime hours worked** | **Number of orders taken** | **Standard hourly rate** | **Overtime rate** | **Rate per order taken** | **Weekly wage** | **Weekly piecework**  **payment** |

Note: Use the *Standard hourly rate*, *Overtime rate*, and *Rate per order taken* given to you by your teacher for the Week 1 calculations.

(ii) Using appropriate formulae determine the:

* wage for each week
* piecework payment for each week
* **total** wage over the 4 weeks
* **total** piecework payment over the 4 weeks.

**Extension**

A friend has told you about a payment method called commission. Using the commission method of payment you will receive a small *retainer payment*, plus a percentage of the *total value of the orders* you take over the week.

The employer has provided you with the *total value of the orders* that were taken each week (provided in the table below). Your teacher will provide you with the retainer payment and the percentage commission that you will receive. Using this information calculate the payment that you would receive each week.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Week** | **Total Value of orders** | **Retainer** | **Commission % of orders** | **Total weekly payment** |
| **1** | $15000 |  |  |  |
| **2** | $12000 |  |  |  |
| **3** | $19500 |  |  |  |
| **4** | $11700 |  |  |  |

You can complete the commission calculations by hand (showing all working out) or using a spreadsheet.

**Assessment Design Criteria**

**Concepts and Techniques**

CT1 Knowledge and understanding of mathematical information and concepts

CT4 Use of electronic technology to find solutions to practical problems.

**Reasoning and Communication**

RC1 Interpretation of mathematical results

RC4 Communication of mathematical ideas and information.

**For teacher use only:**

**Master list of student data: teachers to issue unique data to each student**



Performance Standards for Stage 1 Essential Mathematics

|  |  |  |
| --- | --- | --- |
|  | Concepts and Techniques | Reasoning and Communication |
| **A** | Knowledge and understanding of mathematical information and concepts in familiar and unfamiliar contexts.  Highly effective application of mathematical skills and techniques to find efficient and accurate solutions to routine and complex problems in a variety of contexts.  Gathering, representation, and interpretation of a range of data in familiar and unfamiliar contexts.  Appropriate and effective use of electronic technology to find accurate solutions to routine and complex problems. | Accurate interpretation of mathematical results in familiar and unfamiliar contexts.  Highly effective use of mathematical reasoning to draw conclusions and consider the appropriateness of solutions to routine and complex problems.  Proficient and accurate use of appropriate mathematical notation, representations, and terminology.  Clear and effective communication of mathematical ideas and information to develop logical and concise arguments. |
| **B** | Knowledge and understanding of mathematical information and concepts in familiar and some unfamiliar contexts.  Effective application of mathematical skills and techniques to find mostly accurate solutions to routine and some complex problems in a variety of contexts.  Gathering, representation, and interpretation of data in familiar and some unfamiliar contexts.  Mostly appropriate and effective use of electronic technology to find mostly accurate solutions to routine and some complex problems. | Mostly accurate interpretation of mathematical results in familiar and some unfamiliar contexts.  Effective use of mathematical reasoning to draw conclusions and consider the appropriateness of solutions to routine and some complex problems.  Mostly accurate use of appropriate mathematical notation, representations, and terminology.  Clear and appropriate communication of mathematical ideas and information to develop some logical arguments. |
| **C** | Knowledge and understanding of simple mathematical information and concepts in familiar contexts.  Application of some mathematical skills and techniques to find solutions to routine problems in familiar contexts.  Gathering, representation, and interpretation of data in familiar contexts.  Generally appropriate and some effective use of electronic technology to find solutions to routine problems. | Generally accurate interpretation of mathematical results in familiar contexts.  Appropriate use of mathematical reasoning to draw conclusions and consider the appropriateness of solutions to routine problems.  Generally appropriate use of familiar mathematical notation, representations, and terminology.  Appropriate communication of mathematical ideas and information. |
| **D** | Basic knowledge and some understanding of simple mathematical information and concepts in some familiar contexts.  Application of basic mathematical skills and techniques find partial solutions to routine problems in some contexts.  Some gathering, representation, and basic interpretation of simple data in familiar contexts.  Some appropriate use of electronic technology to find solutions to routine problems. | Some interpretation of mathematical results in some familiar contexts.  Attempted use of mathematical reasoning to consider the appropriateness of solutions to routine problems.  Some use of familiar mathematical notation, representations, and terminology.  Attempted communication of simple mathematical ideas and information. |
| **E** | Limited knowledge or understanding of mathematical information or concepts.  Attempted application of basic mathematical skills or techniques, with limited accuracy in solving routine problems.  Some gathering and attempted representation of simple data in a familiar context.  Attempted use of electronic technology in to find a solution to a routine problem. | Limited interpretation of mathematical results.  Limited awareness of the use of mathematical reasoning in solving a problem.  Limited use of mathematical notation, representations, or terminology.  Attempted communication of an aspect of mathematical information. |