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4748-120 (Online Evolve) and 4748-220 (Paper based)

Functional Skills Mathematics Level 2

Chief Examiners' report – April 2022

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1 Introduction

The purpose of this document is to provide centres with feedback on the performance of candidates for 4748-120 and 4748-220 Functional Skills Mathematics Level 2.

The Chief Examiners' Report has been reintroduced as a result of feedback from centres, to give them guidance in preparing candidates for examination.

2 Overall Performance

This report covers the period from April 2020 to April 2022. During this period there has been considerable disruption to learning and assessment opportunities for many candidates because of the Covid pandemic. It is to the credit of both centres and their learners that, despite the problems presented, so many candidates have been able to successfully complete their assessments.

The new assessment format for Functional Skills Mathematics was implemented in 2019, a response to Ofqual's new requirements and specifications.
Ofqual requires the distinct identification of underpinning knowledge and problem solving skills, within the assessment, and for candidates to complete part of the assessment without a calculator. Candidates are therefore required to undertake a two part assessment.

	Part 1 **Calculator not permitted** **(25minutes)**	**Part 2** **Calculator permitted** **(1 hour 20minutes)**
Underpinning knowledge (15marks = 25%)	10 single mark context free questions	5 single mark context free questions
Problem solving (45marks = 75%)	between 2 to 5 problem solving questions with practical context (total 5 marks)	1 single mark check (for sense of result) 9 problem solving questions with practical context (mark tariff between 2 and 7 marks each, total 39 marks)

Although many candidates have coped well with the new assessment requirements and have been well prepared for the level at which they have been entered, a very significant percentage of candidates have performed extremely poorly. Approximately 10% of candidates have achieved 10 marks or less which suggests that they were entered for assessment well before they could reasonably cope with Level 2 requirements. For example, some candidates were unable to complete very basic calculations involving fractions and/or percentages and failed to even attempt the majority of problem solving questions in Part 2 of the assessment.

2.1 Areas of good performance

A large number of candidates cope very well with the assessment formats, both paper based and online versions, producing well worked solutions to the problems set.

Well prepared candidates are coping well with both the isolated, context free questions and using their knowledge and skills to recognise and obtain a solution or solutions to a number of complex problems.

Most of these candidates cope with calculation requirements and understand the principles of basic operations (addition, subtraction, multiplication, division and BIDMAS) and can deal with fractions, decimals, percentages, ratios/proportion and scaling within both types of question. Basic geometry and algebra has been dealt with well by successful candidates.

Statistical problems have been dealt with competently by these candidates, who can generally at least calculate averages, including estimation from grouped data, and ranges accurately. Successful candidates have also dealt with two event probability and tables competently. Similarly, understanding and interpretation of scales, scale plans and various data presentations has been dealt with satisfactorily.

Successful candidates have given sensible explanations of their results and demonstrated understanding of the problem contexts.

2.2 Areas for development

2.2.1 General observations

Although many candidates have been well prepared for their chosen assessment format, script marking shows that a significant number still seem to be unaware of some or all of the detail required. There have been a significant number of candidates who seem to be unprepared for, or simply unable to cope with, the demands of the Level 2 papers, particularly the need to make accurate calculations using fractions, percentages and ratios; rounding to given numbers of decimal places; reading and applying scales; and making statistical calculations including probability.

Candidates are expected to show their working in order to be eligible for compensation marks in cases where they have not achieved a fully correct answer. This has been a particularly important issue for some online candidates who are clearly doing their working out on paper and neglecting to transfer some or all of their working to the online script.

Also some online candidates do not appear to have had sufficient practice in using the diagram or chart tools and have therefore lost a significant number of marks.

2.2.2 Underpinning knowledge (UPK) questions

There are a total of fifteen underpinning knowledge questions, generally with no contextual setting. Ten of these questions are in the calculator not permitted section. Here candidates have very restricted time (just under two minutes per question) and therefore need to be aware that they should move quickly between questions.

Many of the questions are straightforward calculations involving an understanding of fractions, percentages and ratios. Some will involve basic geometry (calculation of angles); calculations of areas, perimeters and volumes; and simple statistics questions including probability.

Areas where some candidates performed less well –
UPK (selected from various assessment versions)

The following UPK question types were poorly attempted by more than half the candidates sitting particular assessment versions:

- **Division and multiplication with large numbers:** some candidates find use of large numbers challenging, the decimal place position being particularly difficult, e.g. 27,000 ÷ 400 = 67.5 A number of candidates are attempting to use grid methods for these (and other) calculations. For many, the method itself seems to evoke more confusion than the sum itself.
- **Multiplication and division using whole numbers, including negative numbers:** candidates sometimes neglect to take account of negative signs, e.g. -12 x 1400.
- **Multiplication of decimals,** e.g. **3.011 x 0.3- confusion of decimal position**
- **Using BIDMAS conventions in calculation**
  Misunderstanding of index, e.g.. $8^2 = 64$ not 16.
- **Approximation using rounding:** some candidates do not understand using approximation in calculations, e.g. an accurate approximation of 72 x 159 would be 70 x 160.
- **Rounding to a given number of decimal places:** some candidates give more places or fail to round correctly, e.g. 456.4783 to 2 decimal places is 456.48
- **Calculations using mixed, proper and/or improper fractions:**
  e.g. fraction of one number of another in simplest form - some candidates do not simplify or only partially simplify their answer.
- e.g. subtraction of improper fractions**;** addition of mixed and proper fractions**;**
- $5\frac{3}{8} - \frac{9}{16}$ = $\boxed{4}\ \frac{\boxed{15}}{\boxed{16}}$

  Note: Candidates need to be aware of the answer box format shown above
- **Decreasing order and recognising relationships between percentages, fractions and decimals.**
- **Fraction as a percentage; percentage as a fraction; decimal as a fraction (simplest form) ,** e.g. $\frac{7}{20}$ is 35% ; 60% is $\frac{2}{5}$; 0.875 as a fraction is $\frac{7}{8}$
  Some candidates do not simplify or only partially simplify their answer.
- **Number as a percentage of another:** e.g. some candidates thought that 27 / 27 was 0% or 1%

- **Calculation of the percentage of a number,** e.g. 24% of 600; percentage including decimal place, e.g. 3.5% of 700.
- **Ratios:** difficulties with simplest form, e.g. 49 : 21 :14 simplifies to 7 : 3 : 2
- **Issues with co-ordinates; co-ordinates from constructed triangle on grid.**
- **Identify largest amount from a mix of words and figures,** e.g. understanding nought point three million, two hundred thousand and 1,531,491.
- **Writing numbers given word version:** many candidates have difficulty with positions and numbers of figures,
  eg forty nine thousand and twenty three is 49023 not 4900023
- **Simple algebraic equations:** e.g. solve for x the equation 5x – 6 = 29
- **Surface area of a cube.**
- **Calculation of speed, distance and time,** e.g. how long does it take to travel 360 miles at 60 miles/hour.
- **Circumference of circle:** candidates must know formula and are expected to use given value for π, e.g. $\frac{22}{7}$ must be used if given.
- **Surface area of a cube given dimension:** many candidates did not calculate for six sides and some added dimensions
- **Volumes of 3-D shapes:** eg pyramid from given formula
- **Calculation of angles in geometric shapes, such as polygons, and between parallel lines.**
- **Plans and elevations:** identification from 2-D diagrams

2.2.3 Problem solving (PS) questions

There are a total of twelve problem solving questions, including two in the calculator not permitted section.

The subject content of the new qualification is, with a few exceptions, broadly similar to that required in the legacy qualification. However, many candidates have, understandably, found difficulty coping with the style and scope of problem solving questions, given the number of different contexts presented.

Candidates must understand that problem solving (as defined by Ofqual) will mean that they will have to identify mathematical processes required for solutions to problems. There will be little or no scaffolding within a question and little guidance given beyond a start point and a finish point. This is a very challenging dimension, incorporated in the new specifications, both for centres and candidates.

Candidates will be expected to choose an appropriate approach and methods as well as carry out calculations. They will also be given opportunities to interpret information.

Areas where some candidates performed less well – (examples from various assessment versions)

- **Units:** Misunderstanding units, particularly relating to linear dimensions (mm, cm, m and km) and those of time, prevents some candidates from successfully completing questions. Many candidates do not show units either in their answers or workings. Although candidates will not be repeatedly penalised for this, the absence of units can lead to confusion for them as their answer develops, e.g. when dealing with scale plans. Many candidates ignore the need to make use of the £ sign and some give answers in incorrect money format, e.g. an answer £107.30 written as £107.3 will be penalised.

- **Explanations:** Problem solving questions may specify a requirement for explanation (comments). Candidates must be aware that, although marks will be awarded for relevant calculations, full marks will require suitable explanation using their results, preferably with reference to numerical values calculated: The explanation should link with (refer back to) the problem stated. Simple explanations are all that are required,
  e.g. *Problem*: a company claims that the area rented for an exhibition last year was 4% smaller than the area on offer this year
  *Result of calculation***:** area last year is $4.8m^2$, this year it is $5m^2$
  *Answer***:** the company is correct
  *Explanation***:** last year is $0.2m^2$ = 4% smaller than this year

- **Graphs and charts:** Many candidates lose marks through omitting axis labels, failing to draw lines of best fit accurately (or at all) and drawing accurately (preferably using a straight edge). Explanations from lines of best fit often missing reference to trends (many candidates pick out specific plots rather than trends)

- **Check for sense** Many candidates struggle with this type of question where there is an expectation that they will consider whether a result is sensible or not. Candidates should be advised to look at data or graphical evidence given relating to a given comment or result, e.g. the dimensions of a door will not be 100m, e.g. the average temperature in Manchester will not be 55°C

The following PS question types were poorly attempted by more than half the candidates sitting particular assessment versions:

- **Approximation:** use of approximation / estimation to find simple fractions from large numbers and for checking answers
- **Calculation of VAT from full price:** e.g., cost of object before VAT added when given the price including VAT
- **Understanding simple balance sheets:** e.g., simple profit and loss calculations including negative numbers
- **Probability:** involving two events and probability from table with two variables
- **Estimation of means from grouped data**

- **Range:** is not an average; many candidates see range as an alternative average rather than a description of the consistency or variation of data, which can lead to contradictory explanations of results, e.g. calculation and application of range to confirm variability
- **Percentages / fractions:** comparison of values as percentages/ fractions of amounts, some candidates do not recognise whether their answers are sensible of answers (e.g. agents' fees greater than price of object sold)
- **Proportion / fractions:** e.g.**,** quantities of materials required to make solutions given concentration as fraction or ratio
- **Ratio / proportion:** use of comparative proportion, e.g. the gradient of a ramp
- **Speed/ distance/ time calculations**
- **Percentage change:** e.g. **compound interest**
- **Weight of food goods that can be purchased for given amount of money given cost per kg:** fractions or parts of kilograms can be purchased, e.g. 2.5kg of potatoes
- **Calculation of volume of cylinders:** with associated percentage increases of size
- **Scaling and scale diagrams:** e.g. drawing top plan view to scale given 3-D sketch with dimensions: e.g. scaling up from scale diagrams, given scale
- **Conversion factors:** e.g. failing to convert linear measure (applying linear conversion factor to area measure) when finding area from scale diagram: e.g. conversion lbs< > kg
- **Use of given formulae:** misunderstanding of BIDMAS implications, e.g. brackets and indices

3 Recommendations/Advice for centres

The assessment, and therefore the Teaching and learning required, is based on the ***DfE Subject content functional skills: mathematics (February 2018)***
Centres should understand that the assessment is based not only on the 28 Subject Content Specifications (SCS), but also on the general descriptions preceding each section and that the content at Level 2 subsumes and builds upon the content at all the lower levels (i.e. Entry 1 to Level 1). Centres must also be aware that the Level 2 Functional Skills Mathematics is considered to be the equivalent of GCSE grade 4.

Centres should carefully consider whether a candidate is operating at an appropriate level for entry at Level 2. Unfortunately there have been a small number of candidates who were clearly not anywhere near the standard required,

There are two platforms, available for this assessment. paper based and online. Centres should ensure that an appropriate choice of platform is made for candidates based on each candidate's need and preference. A few online candidates have actually indicated on their scripts that their preference for working on paper has been ignored by centres.

Centres should advise candidates about appropriate 'exam technique' particularly with regard to attempting questions in order. Candidates may attempt questions in any order and it may be to a candidate's advantage to start with later questions rather than simply working through.

Candidates who choose to access assessment online need to be prepared not only in terms of the prescribed Functional Skills Standards, but also in terms of using the e-volve platform through the Open Assess platform. They must be well practiced in the use of the presentation tools (tables, diagrams, charts and graphs) but also understand how to insert sufficient text, e.g. to show calculations and working, so that potential compensation marks, in the event of incorrect answers, are accessible.

The importance of showing working in paper based assessment should be stressed for the same reason.

4 Additional Information

Centres should be aware that pass marks may vary from paper to paper as a result of an awarding process undertaken by City & Guilds. Any difference in pass marks reflects the perceived and actual difference in demand of the exam papers, including the source materials and the questions themselves. Therefore, it is possible that two candidates with the same score may have different overall results (pass or fail) if they sat different papers.

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