4748-119 (E-volve) and 4748-219 (Paper-based) Functional Skills Mathematics Level 1

Chief Examiner Report

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1 Introduction

The purpose of this document is to provide centres with feedback on the performance of candidates for 4748-119 and 4748-219 Functional Skills Mathematics Level 1.
Centres should read this report in conjunction with the Guidance for delivery document.

2 Overall Performance

This report covers the period from April 2022 to December 2022.

Candidates are expected to adequately cover underpinning knowledge and problem-solving skills within the assessment, including completing part of the assessment without a calculator. Candidates are therefore required to undertake a two-part assessment.

	Part 1 **Calculator not permitted** **(25 minutes)**	**Part 2** **Calculator permitted** **(1-hour 20 minutes)**
Underpinning knowledge **(15 marks = 25%)**	10 single mark context free questions	5 single mark context free questions
Problem solving **(45 marks = 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 6 marks each, total 39 marks)

Many candidates have achieved well within these assessment requirements. The overall pass rate has improved, and a number of candidates have achieved high marks. However, a significant percentage of candidates performed less well. Slightly more than 10% of candidates achieved 10 marks or less indicating that they were less well prepared for an assessment with Level 1 requirements. For example, some candidates were unable to complete basic calculations involving fractions and/or percentages and did not attempt the problem-solving questions in Part 2 of the assessment.

2.1 Areas of good performance

A large number of candidates produced well worked solutions to problems set, both on screen and on paper.

Many candidates handled the isolated and context free questions and used their knowledge and skills to recognise and obtain a solution to a number of complex problems. These candidates achieved correct answers to most of the underpinning knowledge items and scored well in the non-calculator section.

Similarly, candidates understood the principles of basic operations (addition, subtraction, multiplication, division and BIDMAS) and dealt with fractions, decimals, percentages, ratios/proportion and scaling within both types of question.

Statistical problems were dealt with competently, including calculating averages and ranges accurately. Probability questions using word descriptions and fractions were also completed well with explanations of the results, demonstrating understanding of the problem contexts. As were sorting data into groups; interpreting plans and elevations; and use of basic geometry.

2.2 Areas for development

2.2.1 General observations

Script marking shows that some candidates are not able to meet the demands of the Level 1 papers. In particular the need to make accurate calculations using fractions, percentages and ratios; rounding to given numbers of decimal places; reading and applying scales; grouping data 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.
Some online candidates do not appear to have had sufficient practice in using the diagram or chart tools and therefore lost a significant number of marks.

2.2.2 Underpinning knowledge (UPK) questions

There is a total of 15 underpinning knowledge questions, generally with no contextual setting. Ten of these questions are in the non-calculator section. Here candidates have just under two minutes per question and therefore need to be remain aware of the time limitations.

Many of the questions are calculations involving an understanding of fractions, percentages and ratios. Some 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 (across the assessment versions)

The following UPK question types were less successfully attempted by more than half the candidates.

Underpinning knowledge	Examples/explanation
Calculations using decimals:	some candidates are losing marks (even when using a calculator) by misplacing decimal points
Rounding to given number of decimal places	e.g., to 2dp
Multiplication of whole number by a fraction	e.g., ¾ x 4400
Calculation using fractions:	e.g., calculation of one fifth as a price reduction ***Note:*** *common error: one third is not 30%, nor 0.3* e.g., What is 0.75 as a fraction in its simplest form? $\frac{\boxed{3}}{\boxed{4}}$ ***Note****: answer box* *Candidates need to be aware of the format shown above*
Calculation using percentages	e.g., recognition of 20 out of 50 (customers) is 40% e.g., recognition that 30% is the same as 3/10 e.g., increasing a whole number by a percentage: increase 800 by 25%
Calculation using ratio	e.g., use of ratio 1: 2 e.g., number of over 60's in area from given total and ratio
Weight conversions	e.g., 1.25kg = 1250g
Linear conversion	e.g., recognition that 10mm = 1cm, 1000m = 1km
Calculation of area and volume	e.g., area of rectangle 5m x 7m = $35m^2$ ***Note:*** *common error is addition of dimensions* e.g., volume of cube given one side
Time calculation	e.g., additions of hours and minutes e.g., recognition that 38.5 hours is 38 hours 30 minutes ***Note****: common error: decimal hours are not equivalent to minutes*
Use of scale	e.g., use of 1cm represents 1m e.g., accurate reading including 2mm squares on graph paper
Recognition of number of lines of symmetry	e.g., for a regular (named) polygon

2.2.3 Problem solving (PS) questions

There is a total of 12 problem solving questions, including two in the ‘calculator not-permitted’ section.

Many candidates have found difficulty coping with the style and scope of problem-solving questions, given the number of different contexts presented.

There is little or no scaffolding within a question and little guidance given beyond a start point and a finish point. Candidates are expected to choose an appropriate approach and methods as well as carry out calculations. They are also be given opportunities to interpret information.

Areas where some candidates performed less well –

Problem Solving

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 did not show units either in their answers or workings. Although a candidate will not be repeatedly penalised for this, the absence of units can lead to confusion for the candidate as their answer develops.

e.g. when dealing with scale plans.

Similarly, the £ sign is not used, and answers are given in incorrect money format.

e.g. an answer £4.30 written as £4.3 or £4.333 will be penalised.

Explanations:

Many candidates are missing out on an extra mark in questions that require ‘rounding off’ with a brief summary of how their results answer the problem outlined in the question.

Problem-solving questions may specify a requirement for explanation. Candidates must be aware that, although marks will be awarded for relevant calculations, full marks will require clear explanations using their results, preferably with reference to numerical values calculated: The explanation should link with the problem stated.

Example of a problem	Example of an expected answer
A customer wants to buy the best value paint	e.g., ***Result of calculation*:** option A £19.00 option B £23.50 ***Answer*:** customer should buy option A ***Explanation*:** option A is cheaper by £4.50
A holidaymaker wants to choose the warmest place to go	e.g., ***Result of calculation*:** mean temperature for place A is 26°C and place B is 19°C ***Answer*:** the holidaymaker should choose place A ***Explanation*:** A is warmer than B average temperature for A is 26°C > 19°C for B

Presentation of results

Most tasks require some graphical support for, and/or summary of results. A number of candidates lost marks for the following reasons:

Format	Issues
Tables	inadequate / no headings poor layout data inconsistent with results
Scale diagrams	misunderstanding of scale failure to label items
Charts / graphs	failure to label axes, particularly the vertical axis do not construct a continuous linear scale on the vertical axis failure to start the vertical scale at zero (bar chart only) do not draw bar heights, plots or sectors accurately failure to use a straight edge (ruler) in paper-based versions

Check for sense: Many candidates struggled 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 given data or graphical evidence relating to a given comment or result.

Example	Response
A student works out that the average temperature in Manchester for December is 165°C.	165°C is far too high a temperature.
Recognise whether an interpretation of data presented as a chart is accurate (bar charts not starting at zero on the vertical scale may distort differences).	Sales in May are not twice as much as in June as bar scale does not start at zero.
Recognise whether (or not) appropriate amounts or units are used.	100m is too big for the width of a door, wrong units used, cm not m.
	a person will not weigh 80g, wrong units used, should be kg.
	the area of a bedroom floor will not be $24cm^2$, should be $24m^2$.

The following problem-solving question types were unsuccessfully attempted.

Number calculations (some involving negative numbers)- e.g., additions of scores that may be positive or negative.

Number calculations	Example
Division of large number by smaller number, word formula given	Some candidates have difficulty with 60000 ÷ 300 without a calculator.
Number of events per day from year total	Some candidates unaware that there are 365 days in one year.
Money calculations: a mark often lost for absence of explanation	Accurate calculation of money spent over 3 days for one person, compared to daily spend of second person, but simple explanation that A spent less than B omitted.
	Cost of furniture items with discount. Some candidates unsure of % discount methods, expectation at this level for multiplying using fractions or decimal fractions.
	Calculation of simple interest on two loans to find affordability, many candidates did not show understanding of simple interest and therefore were unable to work out the total repayments and/or the consequent monthly repayments.
	Cost of event, hire of rooms and hospitality, some candidates found difficulty with discount calculation.
	Taxi fare requiring calculation of mileage from table and understanding fixed rate plus extra miles, given word formula – some candidates unable to read mileage table with different town distances, some misunderstanding of fixed amount in formula.
	Weight of food goods that can be purchased for given amount of money given cost per kg, candidates unaware that fractions of kg can be purchased, e.g., 2.5kg of potatoes costing 80p per kg can be bought for £2.

Income tax calculation	Understand tax is on total – free pay, e.g., 20% tax on salary of £20 000 with no tax on first £12 000 is £1600 not £4000. Some candidates have **added** the tax to the salary, thereby working out that tax is greater than the salary.
National Insurance calculation	Some candidates unable to calculate weekly salary and / or neglect to give answer for a year (52 weeks). Some candidates make a percentage calculation on the total salary missing the information contained in the word form of the formula.
Calculations using simple business accounts tables	Finding range over year's monthly totals many candidates appear not to understand negative amount.
	Completing a monthly profit and loss table to determine whether a profit has been made at the end of the period, many candidates calculate with negative (loss) figures inaccurately.
Problems involving symmetry	Drawing squares on diagram and lines of symmetry (some candidates drew shapes other than squares); eg floor design with different coloured tiles. Some candidates draw symmetry in one dimension only when two lines of symmetry required. ***Note*** *candidates should know lines of symmetry in a regular polygon is equal to the number of its sides.*
Percentage additions	Money in savings account after one year given annual simple percentage interest. Some candidates give only interest as answer.
Use of fractions	Calculation of recommended daily intake of calories to identify suitability of food intake.
Calculations to determine if targets met	Many candidates have difficulty with the concept of target, e.g., sales visits weekly target based on numbers per day, few candidates relate number of daily targets to a weekly total.
Proportion calculations and use of ratio	Number of products made from given large quantity of material.
	As a fraction from pie chart data.
	Determination of numbers of one item from given total numbers of items and ratio.
	Calculation of fruit required to increase number of drinks needed for event, some candidates unable to link number of fruits needed to make one drink to new total number.
	Survey response totals from table data, some candidates need to check that the total number of responses tallies with the individual categories and produce accurate charts to represent results - pie chart construction is not always well done – candidates would be better drawing a bar chart if the question allows choice.
	Hourly rate of wage from total wage, mistakes made due to misunderstanding of decimal point position.
	Quantities and cost of materials mixed in a given ratio, order form to complete for calculated quantities, some candidates omitted to work out both material quantities.

Time calculations	Candidates have difficulty with time concepts particularly where hours and/or minutes and/or seconds are mixed, e.g., number of appointments between two times of day.
	Construction of a timetable for an entertainments event, some candidates do not construct a logical timetable or pay attention to detail (finish time required, consistent use of time format).
Meeting time targets	85% delivery to customers in given time tested, data from table – some candidates unable to find relevant values (on time / not on time) and evaluate percentage. Simple explanation of result often omitted (e.g., meets target because 87% on time is more than 85%)
Questions with scale plans	Number of lengths to swim a given distance, some candidates show difficulty reading scale on given scale plan, and inability to convert kilometres to metres accurately.
	Arrangement and fitting office furniture **–** difficulty understanding scale diagram is elevation (i.e., wall not floor plan) and some unable to interpret scale – therefore incorrect numbers of items fitted, mm to m conversions inaccurate.
Calculation of savings (car share)	Candidates interpreting scale plan distances inaccurately, omitting to apply x2 for return journeys. Explanations sometimes miss the point of the context – need to state if / how much saving made.
Identification of angles	Estimate angle in diagram, recognise 175° as almost straight line.
	Read angle from protractor (diagram) to check if angle is within given limits, some explanations do not refer to both ends of limits.
	Work out angle for pie chart sector**,** 30 items in a total of 120 items will be represented as 90°.
Conversions between metric linear measure	Measurement of amount of material cut. Common error decimal metres to centimetres (0.25m ≠ 250cm and similar).
Calculations using perimeter	Costing paint required for fencing perimeter; candidates inaccurately read from diagram (many miss gap distance), some omit area calculation from height of fence, and candidates unable to link given paint coverage per m^2 with area to be painted.
	Quantity of edging material using given diagram measurements, some candidates not calculating distances and confusing metres and centimetres.
Calculations using area	Finding areas of walls from 3-D representation of room given dimensions and word formula, candidates have difficulty identifying which dimensions will give areas of walls, some calculate volume of room.
	Returfing sports pitch given scale plan of pitch, candidates read from scale plan inaccurately particularly taking account of small squares on graph paper, many candidates work out and use perimeter rather than area.

	Finding cheapest option for floor covering, some misunderstanding about numbers of packs of items required (whole numbers required, not fractions). Some found percentage discount calculation challenging.
	Calculation of area of circular space (word formula given) and cost for covering, candidates omitted to square radius, some unsuccessful rounding value to nearest whole number.
Calculations using capacity (volume)	Identifying largest vehicle capacity, many candidates add dimensions rather than multiplying them, approximate check not always carried out.
Packing boxes in container	Spatial awareness but many candidates calculate number by dividing container volume by box volume. Some unable to convert mm to metres accurately.
Grouping data	Question usually specifies number of groups required Common errors: are overlapping boundaries, inability to clearly state boundaries (eg 1-10, 11-20 etc), forgetting to check total number from addition of grouped data, and inappropriate group sizes. Results often required to be presented in chart form (most candidates will find a bar chart the easiest option).
Extraction of data from table	Identification of suitable item from required criteria, eg suitable accommodation based on price and facilities
Graph construction (line graph only required at Level 1	Graphs showing sales of two items, explanations often omitted (simple reference to sales going up or down is required.)
Calculation of average (mean only required at Level 1) and range	Questions usually require some interpretation of results, eg sales per month over one year, explanations not always clear. In particular, an understanding that range is not an average but gives a measure of the consistency of the results, ie by how much the number of cars sold per month varies month by month.
	Running times in minutes and seconds, candidates need to calculate average accurately. Units often misunderstood, range not calculated, unclear explanations. ***Note:*** *Candidates should be aware that references to variation or consistency in a question is usually a prompt to calculate range,*
	Variation in a shop's monthly profit and loss accounts will be highest profit – lowest profit (which might be a loss, ie a negative number)
One event probability – use of word descriptors	Identifying, from table data, the chances of selecting a person at random who has been waiting for more than 2 minutes is certain if data shows no one has had call answered in under 2 minutes.
	Unlikely that a person who does eat meat is chosen from group, if given seven out of ten are vegetarians.
One event probability – express results as fractions	e.g. one throw of dice, ½ is chance of throwing odd number, some candidates have difficulty in expressing fractions in simplest form.

3 Recommendations/Advice for centres:

The assessment, is based on the: DfE Subject content functional skills Maths

Centres should understand that the assessment is based on the 31 Subject Content Statements (SCS), and also the general descriptions preceding each section and that the content at Level 1 subsumes and builds upon the content at all the lower levels (i.e., Entry 1 to 3).

Centres should consider carefully whether a candidate is operating at an appropriate level to be booked for a Level 1 examination.

There are two platforms, paper-based and online available for this assessment. Centres should ensure that an appropriate choice of platform is made for candidates based on each candidate's need and preference.

Centres should advise candidates about appropriate 'exam technique' particularly with regard to attempting questions in order. Candidates may attempt questions in any order.

Candidates who choose to access assessment online need to be prepared not only in terms of the prescribed Functional Skills subject content, but also in terms of using the E-volve platform. They must be well practised in the use of the presentation tools (tables, diagrams, charts and graphs). Centres are reminded that sample assessments as well as familiarisation tests are available to use on Open Assess.

Online candidates must 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.

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. (which is available in our pass rates document) 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 have taken different versions of papers.

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