

Functional Skills Mathematics at Level 1

Externally set and marked exam (4748-04)

Guidance for Delivery

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1 Introduction

The following document is intended to support tutors with the delivery of the post 2019 Functional Skills Mathematics qualification at Level 1.

This Guidance for Delivery must be read in conjunction with the

- [4748-04 City & Guilds Level 1 & 2 Functional Skills Mathematics Qualification Handbook](#) which contains the DfE Subject content for Functional Skills Mathematics

2. Understanding the Functional Skills Mathematics Subject content

All current Functional Skills Mathematics qualifications (regardless of awarding organisation) are derived from Subject Content published in 2018 by the Department for Education (DfE).

The Subject Content Statements for Level 1 have been incorporated into City & Guilds' Functional Skills qualification handbook (along with the assessment weightings and other aspects of the qualification specifications); nevertheless, the original DfE document can also be found on the [Functional Skills \(4748\) qualification documents webpage](#).

At Level 1, candidates are required to demonstrate a sound grasp of the mathematical skills set out in the Subject Content Statements (SCS1-31), as well as the ability to recognise and obtain mathematical solutions to complex problems in the workplace and other real life situations.

The Level 1 subject content subsumes **all** of the levels below, so it is important that teachers/tutors preparing candidates for Level 1 are also familiar with the requirements at Entry 1, Entry 2, and Entry 3.

There is a broad emphasis on work-based contexts and financial literacy within all Functional Skills Mathematics exams at levels 1 and 2, although these are not specific to any particular vocational sector.

The subject content is split into three areas:

- using numbers and the number system;
- using common measures, shape and space;
- handling information and data / statistics.

There is naturally much overlap between each of these and drawing on different areas should be encouraged when preparing candidates for assessment.

3 Structure of the assessment

The Level 1 Functional Skills Mathematics examinations comprise two sections: a short section without a calculator available and a longer section in which a calculator is permitted. Within both sections there are context-free questions testing underpinning skills and knowledge and there are problem solving questions requiring candidates to tackle problems in straightforward contexts, ie one that requires them to either work through one step or process or to work through more than one connected step or process.

Candidates will be required to analyse the problems to decide suitable approaches, tackle the problems, achieve solutions and explain findings. Problem-solving questions will account for 75% of the marks on each paper.

There are two options for assessment:

- an onscreen examination (e-volve)
- a paper-based examination

Both options are available on demand.

As the examination is summative, candidates should only be entered for the examinations once they have completed a period of learning and have successfully completed practice papers.

4 Time allowance

The total time allowance for Functional Skills Mathematics at Level 1 is 1 hour and 45 minutes comprising.

- Section 1 (non-calculator) 25 minutes.
- Section 2 (calculator permitted) 1 hour and 20 minutes.

5. Permitted equipment

The following is **not permitted**:

- A calculator is not permitted in Section 1.

For the paper-based exams, candidates will need:

Level 1	<ul style="list-style-type: none">• Pen• Pencil• Eraser• 30cm ruler• Protractor• Calculator (Section 2 only)
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6. Using sample papers and familiarisation tests

Candidates should be given plenty of opportunity to familiarise themselves with the format and structure of these assessments before attempting a live exam. A range of sample papers are available to facilitate this – in both PDF format (where candidates intend to complete a paper-delivered live exam) and in our OpenAssess platform to simulate the on-screen testing environment (where candidates intend to take their live exam via the e-volve system). Mark schemes can be found alongside the PDFs, although the on-screen format sample tests have the same content.

Familiarisation with the on-screen layout (eg work/answer boxes) and tools (eg graph/chart/table creators) is especially important where candidates are preparing to use the e-volve system.

In addition to the 'full test' on-screen samples, there is a familiarisation test that enables candidates to practise using these. Practice with section 1 (calculator and work box), 4 (table), 5, Scale 6 (diagram), 7-10 (charts and graphs) will be of particular value to candidates at Level 1.

7. Recording answers and showing workings

In all cases candidates must ensure they record their answers in the spaces provided (on paper or on-screen); they should also show their workings where a space is provided for this (especially if the question is worth more than one mark), as this may enable them to access 'compensation marks' if their final answer is incorrect.

8. Calculators

Candidates are only permitted to use a calculator during Section 2 of the exam.

The on-screen (e-volve) system has a inbuilt calculator that candidates are only able to access once they have completed Section 1 and move on to Section 2.

In the case of paper-delivered exams, access to a calculator must be controlled/monitored by the invigilator; we do not specify any particular type of calculator, and that it should be non-programmable hand-held non-programmable calculator (excluding mobile phones or other devices with access other other data/application) may be used. Candidates may use a scientific calculator but a basic calculator is sufficient.

9. Underpinning skills and problem solving

Both Section 1 and Section 2 will contain a balance of problem solving and underpinning skills questions.

Section	Marks		
	Problem solving	Underpinning skills	Total
1 – non-calculator	5	10	15
2 – calculator permitted	40	5	45

Overall 25% of the marks will be for Underpinning skills and 75% for problem solving.

Underpinning skills questions

The first 10 marks in Section 1 and the first 5 marks in Section 2 are for underpinning skills. These questions will normally have no context or a very limited context and minimal reading demand. They are designed to assess standard mathematical processes for the level.

Problem-solving questions

The final 5 marks in Section 1 and the final 40 marks of Section 2 assess problem solving. Each question will be a single realistic problem based on a topic that (some) people might reasonably meet in everyday life or work. They will not be specific to a particular vocational area of job role.

The Functional Skills Mathematics Subject Content defines a problem as

- having **little or no scaffolding**: there is little guidance given to the student beyond a start point and a finish point. **Questions do not explicitly state the mathematical process(es) required** for the solution.
- The **information is not given in mathematical form or in mathematical language**; or there is a need for the results to be interpreted or methods evaluated, for example, in a real-world context.

Therefore, problem-solving questions will generally not have specific instructions that give the method such as:

- Work out the total cost.
- Draw a line of symmetry on the outline.
- Find the mean on these numbers.

Instead candidates are more likely to come across questions like, for example:

- Is the manager correct?
Explain your answer.
- Which type of ticket do you recommend?
Explain your reasons. Include figures or calculations to support your decision.
- Did the changes make any difference?
Explain your findings to the manager. Show calculations to support your explanation.
- Will the man be better off in the new job?
Give a reason for your answer.

Subject matter

Questions may involve measures such as money, time, weight, liquid measure and calories. Candidates are expected to extract information from text and a variety of other formats including tables, timetables, invoices and receipts, recipes, price lists and advertising material.

Some questions focus on scale and candidates need to be familiar with both reading measurements from scale diagrams and constructing simple diagrams and plans to scale. Some further developments of the contexts typically involve calculation of areas or volumes or the application of ratio.

Common errors are often related to

- insufficient attention given to reading the text content of questions carefully for detail, e.g. discounts given on *cheapest* item
- functional aspects, e.g. purchase of *whole* packs rather than fractions of packs

- interpretation of source documents, eg timetables, receipts with discounts
- ability to calculate, eg fractions, reduction by $\frac{1}{3}$; calculating $\frac{1}{5}$ of a value, 20% deposit or 15% off, ratio
- formula in words, eg final amount = original investment + interest
- misunderstanding scale on scale diagrams
- scaling up and scaling down

Other questions may be statistics based, where candidates are expected to extract information from tables of data with additional information shown in various text formats. They are expected to calculate means and ranges, but are not expected to use other averages. When calculating means, some candidates make calculation errors by misreading the number of items, e.g. by ignoring zero values or making assumptions about times, and therefore dividing incorrectly. A few candidates confuse the calculation of means and/or range with other averages, eg with median or mode, neither of which are required at Level 1.

Introduction to questions.

In order to tackle questions, candidates need to carefully access the instructions given in the introduction and select relevant data from the data given. A number of candidates appear to neglect to read the detail of the requirements of each question and its overall purpose, and some clearly failed to access all required data (information given, eg in tables or charts, will be there for the purpose of answering the question), with some candidates completely ignoring given data.

Format. Problem-solving questions will generally not have specific instructions that give the method like 'Work out the total cost.' or 'What is the volume of paint required?' or 'Work out the mean and range of the data'

The challenge for candidates is to infer the calculations and method required to find a solution to a problem couched in terms such as:

eg A cook needs to know what time to start preparing a meal. She decides to start at 4pm Times and cooking instruction data given. Time for meal to be ready given.

Will the cook have enough time? Explain your decision.using figures.

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.

10. Question types

Each paper contains a mixture of 'fixed response' questions (where there is one correct answer) and 'open response' (which might include a number of steps and range of appropriate responses).

Some of the fixed response questions are multiple choice in format, whereas others will be looking for candidates to provide a specific answer.

Some of the open response questions will involve producing or reading from graphs / charts / tables / diagrams.

Drawing graph/chart items Where a candidate is required to construct a chart or graph OR diagram, they will have to choose titles and axis labels; choose a suitable scale and plot bars or lines.

Drawing diagram items A paper may require the candidate to draw a diagram instead of a graph or chart.

It is strongly recommended that candidates taking the E-volve papers practise drawing charts, graphs and diagrams with the online tools in advance of sitting the paper.

11. Sample papers

Sample assessments can be found on the City & Guilds website at the following link:

www.cityandguilds.com/what-we-offer/centres/maths-and-english/functional-skills

Appendix 1 Amplification of Subject Content

Subject content

Centres should be aware of all the detailed subject content specified for Level 1 in the DfE Subject content document ([DfE Subject content functional skills: Mathematics](#)) and be aware that Level 1 content also subsumes all level content below Level 1.

Particular attention is drawn to the following significant 'upgrading' from previous Level 1 specifications (numbers refer to DfE Subject content):

- 24. Draw 2-D shapes and demonstrate an understanding of line symmetry and knowledge of the relative size of angles
- 25. Interpret plans, elevations and nets of simple 3-D shapes
- 26. Use angles when describing position and direction, and measure angles in degrees
- 28. Group discrete data and represent grouped data graphically
- 30. Understand probability on a scale from 0 (impossible) to 1 (certain) and use probabilities to compare the likelihood of events

General calculation issues

Candidates must understand order of operations conventions (BODMAS/BIDMAS) and apply them to calculations. Online Candidates should be aware that the e-volve calculator currently does not automatically apply BODMAS/BIDMAS.

Candidates should use estimation and approximation techniques when required and understand principles of rounding in functional contexts.

Explanations / comments needed for problem solving questions

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 is required.

e.g. Option B is cheaper by £4.50

e.g Office C is larger than Office B by 20m^2 is greater than 17.6m^2

Candidates must also be prepared to explain why an answer is sensible (or not) based on mathematical process rather than calculated results.

Candidates should be taught the distinction between mean and range and how to use each in explanations in context.

Presentation of results / workings

The importance of showing working on the assessments, ie to show calculations and methods used, should be stressed, particularly so that potential compensation marks, in the event of incorrect answers, are accessible to the candidate. This should be emphasised to online candidates who may use 'pencil and paper' methods initially to formulate their solutions.

Candidates need to understand the use of scales in scale diagrams and be prepared to construct scale diagrams, including adding lines of symmetry.

Candidates should be taught to use a variety of presentation methods to summarise results, including graphs, charts and tables. They must understand that a table is not a chart (and vice versa). Summary tables should be systematically constructed to include rows and columns with appropriate headings.

Level 1 candidates must be prepared to construct line graphs, bar charts and pie charts. They should understand that a line graph is only an option if the data plotted is continuous data. It is not an option if the results illustrated are discrete. Pie charts are suitable only if there is an intention to show proportions. Candidates must know how to group data into suitable categories without overlapping boundaries eg 50 - 99; 100 – 149 (not 50 – 100; 100 – 150)

- A bar chart should have a title, axes labelled, bars labelled (a key is also acceptable), a scale starting at zero and bar heights accurately plotted.
- A pie chart should have a title, segments labelled or a key provided, and sector angles accurately drawn. It must only be used where the intention is to show proportion.
- A line graph should have a title, labelled axes, continuous linear scales on both vertical and horizontal axes, the vertical scale may start at zero (if it does not, a broken line symbol should be used), accurate plots shown clearly and a single line joining the plots.

Candidates who choose to access assessment online need to be prepared not only in terms of the prescribed Functional Skills Specification, 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) including how to insert sufficient text, keys and the use of sensible scales.

Appendix 2

Assessment specification 4748-119 and 4748-219

Total 60 marks					
Time 1 hour 45 minutes (Section 1 - 25 minutes, Section 2 - 1 hour 20 minutes)					
	Total marks	Calculator (75%)	Non-calculator (25%)	Underpinning skills (25%)	Problem solving (75%)
Section 1 Non-calculator	15	<i>0</i>	<i>15</i>	<i>10</i>	<i>5</i>
Section 2 Calculator	45	<i>45</i>	<i>0</i>	<i>5</i>	<i>40</i>
Totals	60	<i>45</i>	<i>15</i>	<i>15</i>	<i>45</i>

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